TUSA®

by PFERD TOOLS



60 YEARS OF EXCELLENCE

GENERAL CATALOG

TUSA®
by PFERD TOOLS

www.tusa-precision.ch

Cronologia

1967
Fondazione.
L'azienda costruisce micro-punte per l'orologeria

1975
Lancio della prima linea di micro-punte per il taglio dell'acciaio

1997
Automatizzazione del processo di costruzione punte tramite l'utilizzo di macchine CNC

2014
Lancio sul mercato di frese in ceramica

2020
Produzione ampliata in un secondo stabile

2024
Tusa entra a far parte del gruppo PFERD TOOLS

Chronology

1967
Foundation.
The company begins manufacturing micro-drills for watchmaking

1975
Launch of the first line of micro-drills for steel cutting

1997
Automation of drill manufacturing with CNC machines

2014
Market launch of ceramic milling cutters

2020
Production expanded into a second facility

2024
Tusa becomes part of the group PFERD TOOLS

Chronologie

1967
Gründung.
Das Unternehmen beginnt mit der Herstellung von Mikrobohrern für die Uhrenindustrie

1975
Einführung der ersten Linie von Mikrobohrern zum Schneiden von Stahl

1997
Automatisierung der Bohrer Produktion durch den Einsatz von CNC-Maschinen

2014
Markteinführung von Fräsern aus Keramik

2020
Produktion wird auf ein zweites Gebäude ausgeweitet

2024
Tusa wird Teil der Unternehmensgruppe PFERD TOOLS

Chronologie

1967
Fondation.
L'entreprise commence la fabrication de micro-forets pour l'horlogerie

1975
Lancement de la première ligne de micro-forets pour la coupe de l'acier

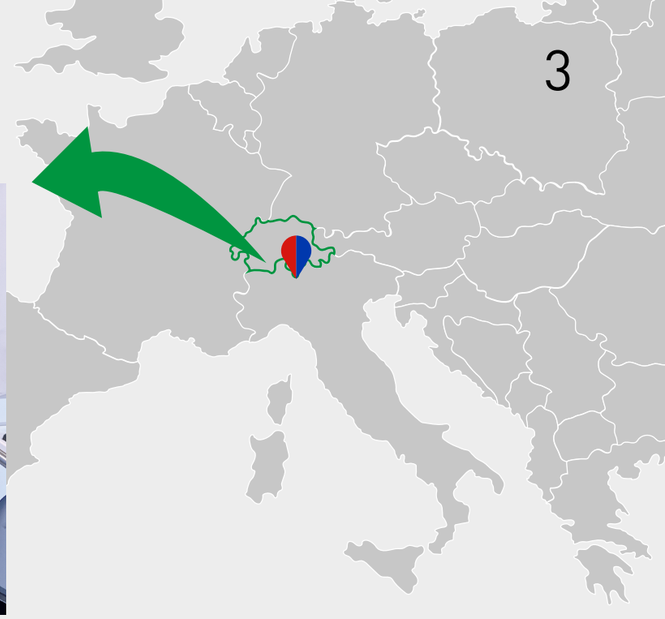
1997
Automatisation du processus de fabrication des forets grâce à l'utilisation de machines CNC

2014
Lancement sur le marché de fraises en céramique

2020
Extension de la production dans un deuxième bâtiment

2024
Tusa rejoint le groupe PFERD TOOLS





I nostri valori

Precisione
Precision
Präzision
Précision

Qualità
Quality
Qualität
Qualité

Flessibilità
Flexibility
Flexibilität
Flexibilité

Personalizzazione
Customization
Personalisierung
Personnalisation

L'azienda in numeri

60 anni di storia.
Tusa è l'azienda più antica del Canton Ticino specializzata nella produzione di utensili in metallo duro integrale

2'000 m² di stabilimento produttivo in Svizzera

650'000 utensili prodotti ogni anno

35 impiegati

42% tasso di accettazione delle offerte

The company in figures

60 years of history.
Tusa is the most ancient company established in Tessin canton for solid carbide tools manufacturing

2'000 sqm production plant in Switzerland

650'000 tools manufactured every year

35 employees

42% offer acceptance rate

Die Firma in Zahlen

60 Jahre Geschichte.
Tusa ist das älteste Unternehmen im Kanton Tessin für die Herstellung von Vollhartmetallwerkzeugen

2'000 m² Produktionsstätte in der Schweiz

650'000 Werkzeuge werden jedes Jahr hergestellt

35 Mitarbeitende

42% Annahmequote der Angebote

L'entreprise en chiffres

60 ans d'histoire.
Tusa est la plus ancienne entreprise du canton du Tessin spécialisée dans la fabrication d'outils en carbure massif

2'000 m² d'usine de production en Suisse

650'000 outils fabriqués chaque année

35 employés

42% taux d'acceptation des offres

Campi di applicazione
Fields of application

Orologeria | Watchmaking



Foratura | Hole drilling

1 **Punta Ø2.005 0/-0.001**
Drill Ø2.005 0/-0.001

Fresatura | Milling

2 **Fresa Ø0.50, Z=3**
End mill Ø0.50, Z=3

Fresatura | Milling

3 **Fresa in sagoma Ø1.20**
Form cutter Ø1.20

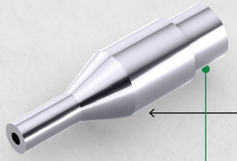
Svasatura | Countersinking

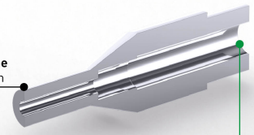
4 **Punta-svasatore Ø0.28/Ø1.30**
Drill–countersink Ø0.28/1.30

Foratura | Hole drilling

1 **Punta Ø1.25, rivestita**
Drill Ø1.25, coated

Scrittura | Writing





Tornitura | Turning

1 **Utensile tornitore Ø2.00, rivestito**
Turning tool Ø2.00, coated

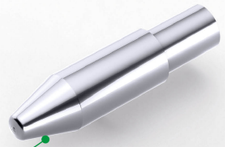
Foratura | Hole drilling

2 **Punta a cupola Ø1.55x38°**
Dome drill Ø1.55x38°



Tornitura | Turning

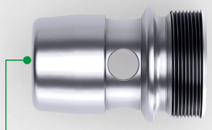
3 **Utensile tornitore Ø1.03, rivestito**
Turning tool Ø2.00, coated



Sagomatura | Shaping

4 **Utensile tornitore 4x3, rivestito**
Turning tool 4x3, coated

Automotive& Oleodinamica



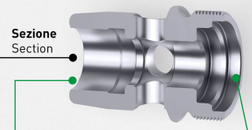
Foratura | Hole drilling

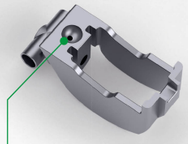
1 **Punta Ø7.80, con IC, rivestita**
Drill Ø7.80, with IC, coated

Alesatura | Finishing

2 **Alesatore Ø8.098, Z=4, con IC, rivestito**
Reamer Ø8.098, Z=4, with IC, coated

Automotive& Hydraulics





Allargatura | Boring

4 **Allargatore Ø9.35, Z=2, rivestito**
Counterbore Ø9.35, Z=2, coated

Sgrossatura | Roughing

1 **Sgrossatore Ø7.989, R5.45, Z=3**
Roughing cutter Ø7.989, R5.45, Z=3

Alesatura | Finishing

3 **Alesatore Ø5.94, Z=6, con IC, rivestito**
Reamer Ø5.94, Z=6, with IC, coated

Elettronica | Electronics



Foratura | Hole drilling

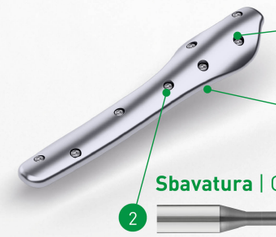
1 **Punta combinata Ø1.73, con IC**
Combined drill Ø1.73, with IC



Taglio | Slotting

2 **Fresa circolare a dentatura extra fine Ø25.00, spessore 0.40**
Circular saw with extra fine teeth Ø25.00, thickness 0.40

Medicale | Medical



Foratura | Hole drilling

1 **Punta Ø1.20, con IC, rivestita**
Drill Ø1.20, with IC, coated

Sbavatura | Chamfering

2 **Smussatore a sfera Ø1.00, rivestito**
Radius chamfer Ø1.00, coated

Fresatura | Milling

3 **Fresa torica Ø1.20, Z=3**
Coner radius end mill Ø1.20, Z=3

Dentale | Implantology



Fresatura | Milling

1 **Fresa Ø2.10, R0.95, Z=4**
End mill Ø2.10, R0.95, Z=4



Foratura | Hole drilling

1 **Punta pilota Torx® Ø2.30, rivestita**
Torx® pilot drill Ø2.30, coated

Fresatura | Milling

2 **Microfresa Torx® Ø0.50, rivestita**
Micro-milling cutter Torx® Ø0.50, coated



Fresatura | Milling

1 **Fresa a profilo Ø2.00, 90°x44°, Z=2-4, rivestita**
Profile cutter Ø2.00, 90°×44°, Z=2–4, coated

Foratura | Hole drilling

1 **Punta Ø2.50, rivestita**
Drill Ø2.50, coated

NUOVA generazione di punte con fori di lubrificazione progettate anche per la lavorazione di materiali tenaci

Tusa presenta le nuove punte TTDS, una linea di punte con fori di lubrificazione interna che permette di ottenere buoni risultati anche sulla lavorazione di materiali difficili quali titanio e superleghe. Dotate di fori di lubrificazione interna che garantiscono un raffreddamento efficace e una migliore evacuazione del truciolo. La geometria avanzata assicura precisione, stabilità e controllo nella foratura, mentre il trattamento delle superfici riduce l'attrito e prolunga la durata dell'utensile. Il rivestimento PVD di nuova generazione offre elevata resistenza al calore e all'usura.

NEW generation of drills with coolant holes, also designed for machining tough materials

Tusa introduces the new TTDS drills, a line featuring internal coolant holes that enable excellent results even when machining difficult materials such as titanium and superalloys. Equipped with internal lubrication channels, they ensure effective cooling and improved chip evacuation. The advanced geometry guarantees precision, stability, and control during drilling, while surface treatments reduce friction and extend tool life. The latest-generation PVD coating provides high resistance to heat and wear.

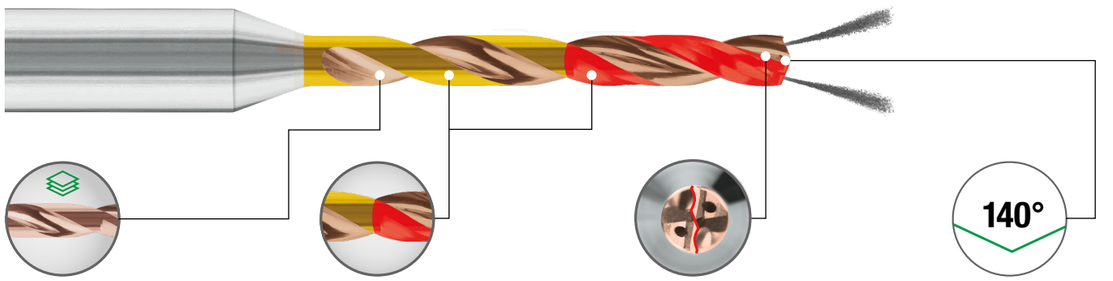
NEUE Generation von Bohrern mit Kühlkanälen, die auch für die Bearbeitung zäher Werkstoffe ausgelegt sind

Tusa präsentiert die neuen TTDS-Bohrer – eine Produktlinie mit interner Kühlmittelzufuhr, die auch bei der Bearbeitung schwieriger Materialien wie Titan und Superlegierungen sehr gute Ergebnisse ermöglicht. Dank interner Kühlkanäle werden eine effiziente Kühlung und verbesserte Spanabfuhr gewährleistet. Die fortschrittliche Geometrie sorgt für Präzision, Stabilität und Kontrolle beim Bohren, während spezielle Oberflächenbehandlungen die Reibung reduzieren und die Standzeit verlängern. Die PVD-Beschichtung der neuesten Generation bietet eine hohe Wärme- und Verschleißbeständigkeit.

NOUVELLE génération de forets avec trous de lubrification, conçus aussi pour l'usinage de matériaux tenaces

Tusa présente les nouveaux forets TTDS, une gamme dotée de canaux de lubrification internes permettant d'obtenir d'excellents résultats, même lors de l'usinage de matériaux difficiles tels que le titane et les superalliages. Grâce à leur système de lubrification interne, ils assurent un refroidissement efficace et une meilleure évacuation des copeaux. La géométrie avancée garantit précision, stabilité et contrôle lors du perçage, tandis que le traitement de surface réduit les frottements et prolonge la durée de vie de l'outil.

TTDS



Rivestimento specifico per micro utensili

Specific coating for microtools

Affilatura a due settori per una migliore precisone del foro

Two-sectors sharpening for better hole precision

Geometria frontale
• Autocentrante
• Onatura frontale

Front geometry
• Self centering
• Front honing

Angolo frontale 140°

Frontal Angle 140°

Linea di punte con fori di lubrificazione pensata per le lavorazioni di acciai e acciai inox

La nostra linea TTDE è progettata per offrire massima produttività e affidabilità, anche nelle lavorazioni più critiche e non presidiate. Le geometrie sviluppate assicurano una truciolatura fluida e costante, mentre la finitura superficiale consente ridotti sforzi torsionali e un'elevata precisione su un'ampia varietà di materiali. Questa linea si distingue in particolare per le ottime prestazioni su acciai, ghise, acciai inossidabili, ma si dimostra efficiente anche nella lavorazione di leghe di titanio e superleghe. Ogni utensile è dotato di un rivestimento PVD specificamente selezionato per ridurre la generazione di calore, migliorare l'evacuazione del truciolo e prolungare significativamente la vita utile dell'utensile.

Drill line with coolant holes designed for machining steels and stainless steels

Our TTDE line is designed to deliver maximum productivity and reliability, even in the most critical and unattended machining operations. The advanced geometries ensure smooth and consistent chip formation, while the surface finish reduces torsional stress and provides high precision across a wide range of materials. This line stands out for its excellent performance on steels, cast irons, and stainless steels, while also proving highly effective in machining titanium alloys and superalloys. Each tool features a carefully selected PVD coating to minimise heat generation, improve chip evacuation, and significantly extend tool life.

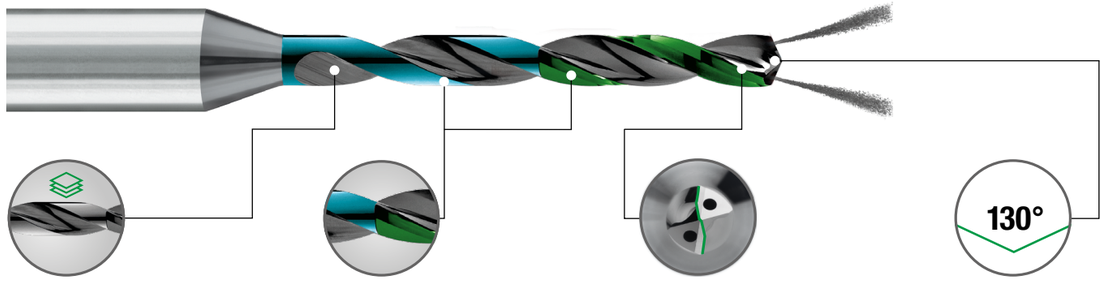
Bohrerserie mit Kühlkanälen, entwickelt für die Bearbeitung von Stahl und Edelstahl

Unsere TTDE-Linie wurde entwickelt, um maximale Produktivität und Zuverlässigkeit selbst bei den anspruchsvollsten und unbeaufsichtigten Bearbeitungen zu gewährleisten. Die optimierten Geometrien sorgen für eine gleichmäßige und stabile Spannungsbildung, während die Oberflächenbeschaffenheit geringe Torsionskräfte und höchste Präzision bei einer Vielzahl von Materialien ermöglicht. Besonders überzeugt diese Linie durch ihre hervorragende Leistung bei Stählen, Gusseisen und rostfreien Stählen und zeigt gleichzeitig eine hohe Effizienz bei der Bearbeitung von Titanlegierungen und Superlegierungen. Jedes Werkzeug ist mit einer speziell ausgewählten PVD-Beschichtung ausgestattet, die die Wärmeentwicklung reduziert, die Spanabfuhr verbessert und die Standzeit deutlich erhöht.

Génération de forets conçus pour l'usinage de matériaux tenaces

Notre gamme TTDE est conçue pour offrir une productivité et une fiabilité maximales, même dans les opérations d'usinage les plus critiques et sans surveillance. Les géométries optimisées assurent une formation de copeaux fluide et régulière, tandis que la finition de surface réduit les efforts de torsion et garantit une grande précision sur une large gamme de matériaux. Cette gamme se distingue par d'excellentes performances sur les aciers, fontes et aciers inoxydables, tout en étant très efficace dans l'usinage des alliages de titane et des superalliages. Chaque outil bénéficie d'un revêtement PVD soigneusement sélectionné pour limiter la génération de chaleur, améliorer l'évacuation des copeaux et prolonger significativement la durée de vie de l'outil.

TTDE



Rivestimento specifico per micro utensili

Specific coating for microtools

Affilatura a due settori per una migliore precisone del foro

Two-sectors sharpening for better hole precision

Geometria frontale
• Autocentrante
• Onatura frontale

Front geometry
• Self centering
• Front honing

Angolo frontale 130°

Frontal Angle 130°

Legenda simboli

Icons | Symbole | Symboles

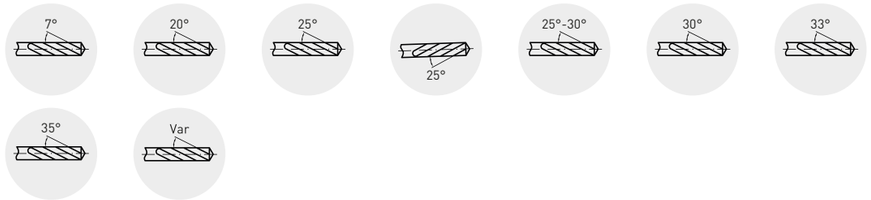
N° denti
N° of teeth
Zähnezahl
N° dents

Z 2 | Z 3 | Z 3-4 | Z 4 | Z 4-6 | Z 4-8

Norme
Norm
Normung
Normes

DIN 212 | DIN 338 | DIN 6528 | DIN 6539 | TUSA NORM

Angolo dell'elica
Flute angle
Spiralwinkel
Angle d'hélice



Angolo di punta
Point angle
Spitzenwinkel
Angle de pointe



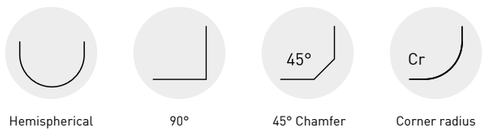
Lunghezza
Length
Länge
Longueur



Tagliente al centro
Center cutting
Zentrumschnitt
Coupe au centre



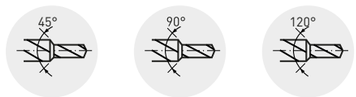
Geometria frontale
Profile geometry
Stirngeometrie
Géometrie en bout



Profondità di foratura
Depth of drilling
Bohrungstiefe
Profondeur de perçage

2xD | 3xD | 3,5xD | 4xD | 5xD | 6xD | 7xD
9xD | 12xD | 15xD | 18xD

Smusso
Chamfer
Fase
Chanfrein



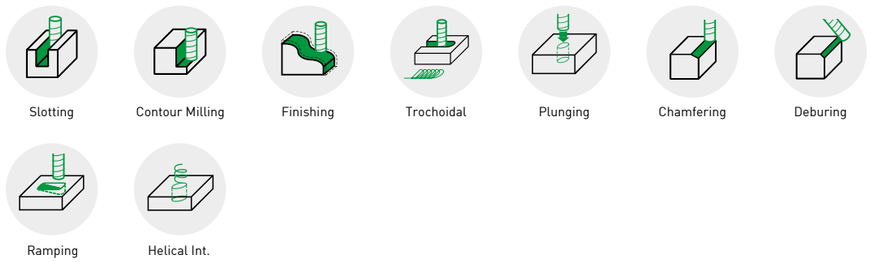
Gambo
Shank
Schaft
Queue



Rivestimento
Coating
Beschictung
Revêtement



Lavorazioni
Machining
Bearbeitung
Usinage



Materiali
Materials
Materialien
Matériaux



Materiali lavorati

Machined materials | Bearbeitete Materialien | Matériaux usinés

P00

Acciai a basso contenuto di Carbonio, Truciolo lungo
Long chipping Low Carbon Steels

P01

Acciai a basso contenuto di Carbonio, Truciolo corto
Short chipping Low Carbon Steels

P02

Acciai a medio e alto contenuto di Carbonio
Medium and High Carbon Steels

P03

Acciai Legati, Acciai da Utensili (N/mm² 600-850)
Alloy Steels, Tool Steels
(N/mm² 600-850)

P04

Acciai Legati, Acciai da Utensili (N/mm² 850-1400)
Alloy Steels, Tool Steels
(N/mm² 850-1400)

P05

Acciai Ferritici, Martensitici, PH SS
Ferritic, Martensitic, PH SS

P06

Acciai Ferritici, Martensitici, PH SS, Induriti
High Strength Ferritic, Martensitic, PH SS

M01

SS Acciai Inossidabili, Austenitici
Austenitic Stainless Steel

M02

SS Acciai Inossidabili, Austenitici, Induriti
High Strength Austenitic SS, Cast SS

M03

SS Duplex
Duplex SS

K01

GG Ghisa Grigia
Grey Cast Iron

K02

GS Ghisa Sferoidale
Low and Medium Strength CGI, Ductile Irons

K03

GS Ghisa Sferoidale, Indurita
High Strength Ductile and Austempered Ductile Iron

N01

Alluminio Puro
Wrought Aluminium

N02

Leghe di Alluminio a basso contenuto di Si, Leghe di Magnesio, Si<12%
Low Si Al Alloys and Magnesium Alloys Si<12%

N03

Leghe di Alluminio ad alto contenuto di Si, Si>12%
High Si Al Alloys Si>12%

N04

Rame, Ottone, Leghe a base di Zinco
Copper, Brass, Zinc Based Alloys

S01

HRSA, Leghe a base di Fe
Iron Based HRSA

S02

HRSA, Leghe a base di Co
Co Based HRSA

S03

HRSA, Leghe a base di Ni
Ni Based HRSA

S04

Titanio e Leghe a base di Titanio
Ti and Ti Alloys

H01

Acciai Temprati | HRC 44-48
Hardened Materials | HRC 44-48

H02

Acciai Temprati | HRC 48-55
Hardened Materials | HRC 48-55

H03

Acciai Temprati | HRC 56-60
Hardened Materials | HRC 56-60

O01

Materiali Termoplastici e Termoindurenti
Thermoplastic and Thermosetting Materials

O02

Materiali Compositi (Fibre di Vetro)
Composite Materials (Glass Fibers)

O03

Materiali Compositi (Fibre di Carbonio)
Composite Materials (Carbon Fibers)

O04

Materiali Compisiti (Fibre Aramidiche)
Composite Materials (Aramid Fibers)

O05

Grafite
Graphite

***Consulta la lista dei materiali a pagina 188**
*Consult the list of materials on page 188
*Konsultieren Sie die Materialliste auf Seite 188
*Consultez la liste des matériaux à la page 188

Guida alla consultazione del catalogo

Catalog consultation guide | Leitfaden zur Katalogdurchsicht | Guide de consultation du catalogue

Dettaglio utensile
Tool detail
Werkzeugdetail
Détail de l'outil

Caratteristiche tecniche
Technical features
Technische Eigenschaften
Caractéristiques techniques

Descrizione utensile
Tool description
Werkzeugbeschreibung
Description de l'outil

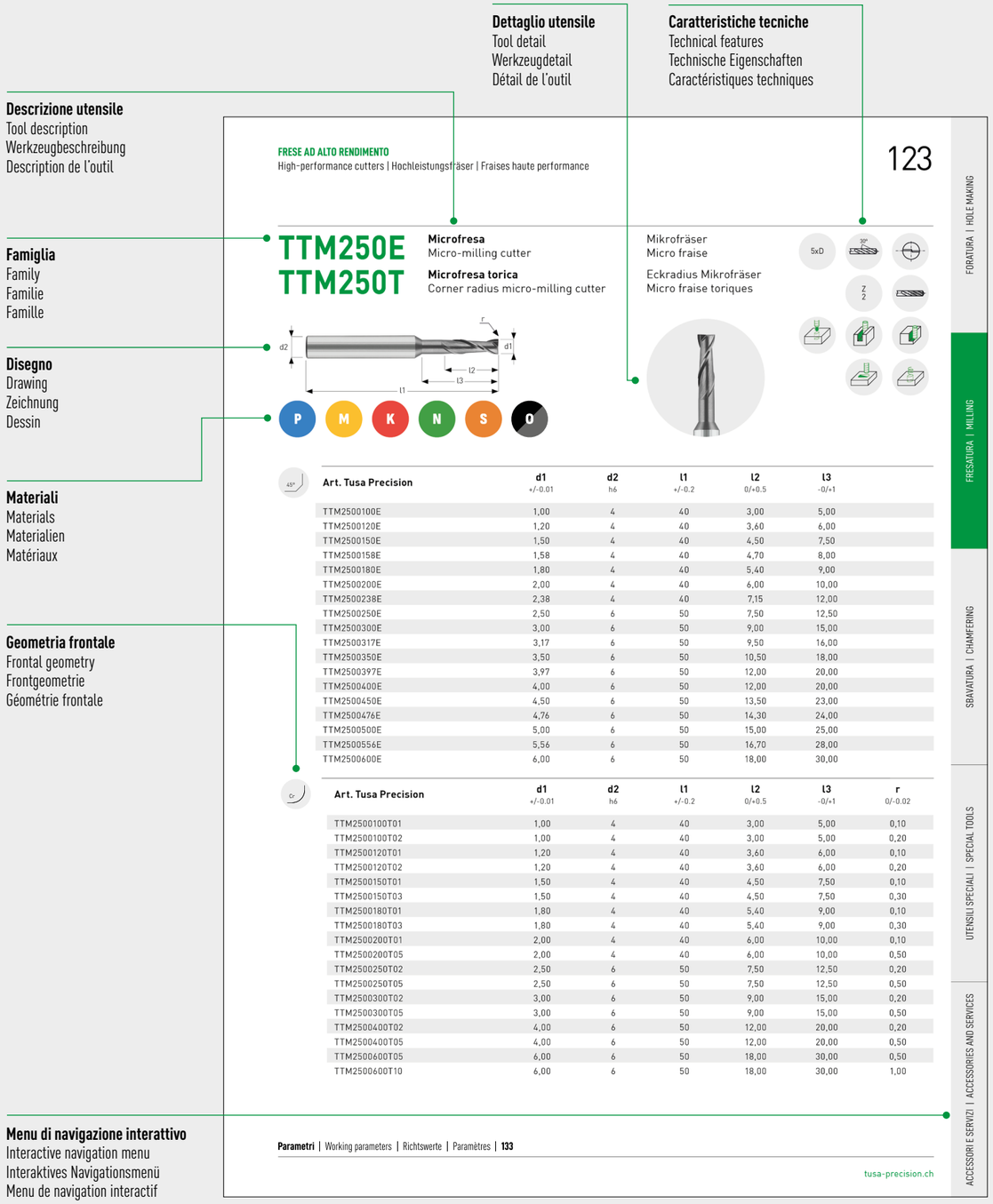
Famiglia
Family
Familie
Famille

Disegno
Drawing
Zeichnung
Dessin

Materiali
Materials
Materialien
Matériaux

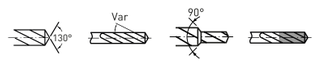
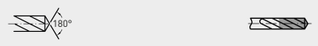
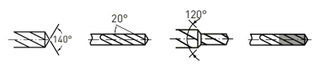
Geometria frontale
Frontal geometry
Frontgeometrie
Géométrie frontale

Menu di navigazione interattivo
Interactive navigation menu
Interaktives Navigationsmenü
Menu de navigation interactif



FORATURA
Hole making | Bohren | Perçage

Punte pilota
Pilot drills | Pilotbohrer | Forets pilote

	Codice prodotto Product code	Ø D mm	Lunghezza utile Max depth	Descrizione Description	Miglior performance Best performance	Acciai Steel Stahl Acier P	Acciai inox Stainless Steel Edelstahl Acier Inoxydable M	Ghise Cast Iron Gusseisen Fonte K	Metalli non ferrosi Non-ferrous metals NE-Metalle Matières non ferreuses N	HRSA - Titanio HRSA - Titanium HRSA - Titan HRSA - Titane S	Acciai Temprati Hardened Steel Gehärteter Stahl Acier trempé H	Non ISO Not ISO Keine ISO Pas d'ISO O	Pagina Page Seite Page	Parametri Working parameters Richtswerte Paramètres
NEW	**MTB27** 	1,00 ÷ 4,00	2xD		**Acciai, ghise** Steel, cast iron	●	◑	●	◑	◑	◑	○	30	38
	MTB27E 	1,00 ÷ 6,00	2xD		**Inox, CoCr** Stainless steel, CoCr	◑	●	●	◑	◑	○	○	32	39
	TTD180E 	0,80 ÷ 6,00	3,5xD		**Acciai, inox, ghise** Steel, stainless steel, cast iron	●	●	●	◑	◑	◑	○	34	40
	TWP 	0,90 ÷ 3,80 T4/T30	-		**Inox, titanio, CoCr** Stainless steel, titanium, CoCr	◑	●	○	○	●	○	○	36	41

Punte da centro
Centering drills | Zentrierbohrer | Forets de centrage

	Codice prodotto Product code	Ø D mm	Lunghezza utile Max depth	Descrizione Description	Miglior performance Best performance	P	M	K	N	S	H	O	Pagina Page Seite Page	Parametri Working parameters Richtswerte Paramètres
	MTB43 	0,60 ÷ 2,00	-		**Multi-materiale** Multi-material	●	●	◑	●	●	●	◑	42	44
	MTB44 	0,60 ÷ 2,00	-		**Multi-materiale** Multi-material	●	●	◑	●	●	●	◑	42	44
	MTB40 	3,00 ÷ 16,00	-		**Multi-materiale** Multi-material	●	◑	◑	●	○	○	◑	43	45
	MTB41 	3,00 ÷ 16,00	-		**Multi-materiale** Multi-material	●	◑	◑	●	○	○	◑	43	45

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

Punte ad alto rendimento

High-performance drills | Hochleistungsbohrer | Forets haute performance

	Codice prodotto Product code	Ø D mm	Lunghezza utile Max depth	Descrizione Description	Punta pre foro suggerita Suggested pilot drill	Miglior performance Best performance	Acciai Steel Stahl Acier P	Acciai Inox Stainless Steel Edelstahl Acier Inoxydable M	Ghise Cast Iron Gusseisen Fonte K	Metalli non ferrosi Non-ferrous metals NE-Metalle Matières non ferreuses N	HRSA - Titanio HRSA - Titanium HRSA - Titan HRSA - Titane S	Acciai Temprati Hardened Steel Gehärteter Stahl Acier trempé H	Non ISO Not ISO Keine ISO Pas d'ISO O	Pagina Page Seite Page	Parametri Working parameters Richtswerte Paramètres
NEW	**TTD203**	1,00 ÷ 4,00	3xD	140° 25°	MTB27 TTD180	**Acciai, ghise** Steel, cast iron	●	●	●	◑	◑	◑	○	46	66
NEW	**TTD207**	1,00 ÷ 4,00	7xD	140° 25°	MTB27 TTD180	**Acciai, ghise** Steel, cast iron	●	●	●	◑	◑	◑	○	48	67
	TTD204	1,00 ÷ 4,00	4xD	140°	MTB27 TTD180	**Acciai, ghise** Steel, cast iron	●	◑	●	◑	◑	◑	○	50	68
	TTD209	1,00 ÷ 4,00	9xD	140°	MTB27 TTD180	**Acciai, ghise** Steel, cast iron	●	◑	●	◑	◑	◑	○	52	69
	TTD215	1,00 ÷ 4,00	15xD	140°	MTB27 TTD180	**Acciai, ghise** Steel, cast iron	●	◑	●	◑	◑	◑	○	54	70
	TTD206E	1,00 ÷ 6,00	6xD	130°	MTB27E TTD180E	**Inox** Stainless steel	◑	●	●	◑	◑	◑	○	56	71
	TTD212E	1,00 ÷ 6,00	12xD	130°	MTB27E TTD180E	**Inox** Stainless steel	◑	●	●	◑	◑	◑	○	58	72
	TTD218E	1,00 ÷ 6,00	18xD	130°	MTB27E TTD180E	**Inox** Stainless steel	◑	●	●	◑	◑	◑	○	60	73
NEW	**TTD203S**	1,00 ÷ 4,00	3xD	140°	MTB27 TTD180E	**HRSAs, PH, titanio** HRSAs, PH, titanium	◑	●	○	○	●	○	○	62	74
NEW	**TTD206S**	1,00 ÷ 4,00	6xD	140°	MTB27 TTD180E	**HRSAs, PH, titanio** HRSAs, PH, titanium	◑	●	○	○	●	○	○	64	75

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

Punte
Drills | Bohrer | Forets

Codice prodotto Product code	Serie Series	Ø D mm	Descrizione Description	Punta pre foro suggerita Suggested pilot drill	Miglior performance Best performance	Acciai Steel Stahl Acier P	Acciai Inox Stainless Steel Edelstahl Acier Inoxydable M	Ghise Cast Iron Gusseisen Fonte K	Metalli non ferrosi Non-ferrous metals NE-Metalle Matières non ferreuses N	HRSA - Titanio HRSA - Titanium HRSA - Titan HRSA - Titane S	Acciai Temprati Hardened Steel Gehärteter Stahl Acier trempé H	Non ISO Not ISO Keine ISO Pas d'ISO O	Pagina Page Seite Page	Parametri Working parameters Richtswerte Paramètres
TA803	Centesimale Hundredth	0,30 ÷ 3,00	130° 35°	MTB43 MTB40	**Multi-materiale** Multi-material	●	●	●	●	◑	○	◑	76	106
MTB25N	Centesimale Hundredth	0,30 ÷ 13,00	118° 25° Cyl	MTB43 MTB40	**Acciai a basso contenuto di carbonio, metalli non ferrosi** Low carbon steel, non-ferrous metals	●	◑	◑	●	○	◑	◑	80	107
TA35	Corta Short	0,20 ÷ 2,00	118° 35°	MTB43 MTB40	**Acciai a basso contenuto di carbonio, metalli non ferrosi** Low carbon steel, non-ferrous metals	●	◑	◑	●	○	◑	◑	84	108
MTB25	Corta Short	0,50 ÷ 20,00	118° 25° Cyl	MTB43 MTB40	**Acciai a basso contenuto di carbonio, metalli non ferrosi** Low carbon steel, non-ferrous metals	●	◑	◑	●	○	○	◑	85	109
MTB33	Corta Short	1,00 ÷ 12,00	118° 30° Cyl	MTB43 MTB40	**Acciai a basso contenuto di carbonio, metalli non ferrosi** Low carbon steel, non-ferrous metals	●	◑	◑	●	○	○	◑	88	110
TA303B	Corta Short	0,50 ÷ 3,00	130° 25°	-	**Multi-materiale** Multi-material	●	●	●	●	○	○	◑	90	111
TC35	Media Medium	0,30 ÷ 2,00	130° 35° Cyl	MTB43 MTB40	**Acciai a basso contenuto di carbonio, metalli non ferrosi** Low carbon steel, non-ferrous metals	●	◑	◑	●	◑	○	◑	91	112
MTB30	Media Medium	0,80 ÷ 16,00	118° 25° Cyl	MTB43 MTB40	**Acciai a basso contenuto di carbonio, metalli non ferrosi** Low carbon steel, non-ferrous metals	●	◑	◑	●	○	○	◑	92	113
MTB35	Media Medium	0,30 ÷ 6,00	118° 25° Cyl	MTB43 MTB40	**Acciai a basso contenuto di carbonio, metalli non ferrosi** Low carbon steel, non-ferrous metals	●	◑	◑	●	○	○	◑	94	114
MTB35L	Media Medium	0,50 ÷ 6,00	118° 25° Cyl	MTB43 MTB40	**Acciai a basso contenuto di carbonio, metalli non ferrosi** Low carbon steel, non-ferrous metals	●	◑	◑	●	○	◑	◑	96	115
MTB45	Lunga Long	0,30 ÷ 13,00	120° 30° Cyl	MTB43 MTB40	**Acciai a basso contenuto di carbonio, metalli non ferrosi** Low carbon steel, non-ferrous metals	●	◑	◑	●	○	◑	◑	98	116
MTB50	Lunga Long	1,00 ÷ 13,00	118° 130° 25°- 30° Cyl	MTB43 MTB40	**Acciai a basso contenuto di carbonio, metalli non ferrosi** Low carbon steel, non-ferrous metals	●	◑	◑	●	○	◑	◑	100	117
MTB60	Extra lunga Extra Long	1,00 ÷ 10,00	118° 130° 25°- 30° Cyl	MTB43 MTB40	**Acciai a basso contenuto di carbonio, metalli non ferrosi** Low carbon steel, non-ferrous metals	●	◑	◑	●	○	◑	◑	102	118

Alesatori
Reamers | Reibahle | Alèsoirs

Codice prodotto Product code	Z Z	Ø D mm	Descrizione Description	Punta pre foro suggerita Suggested pilot drill	Miglior performance Best performance	P	M	K	N	S	H	O	Pagina Page Seite Page	Parametri Working parameters Richtswerte Paramètres
MS402	Ø1.00-Ø4.50 =4 Ø5.00-Ø13.00 =6 Ø13.50-Ø16.00 =8	1,00 ÷ 16,00	7°	-	**Multi-materiale** Multi-material	●	◑	◑	◑	◑	◑	○	104	119

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

FRESATURA
Milling | Fräsbearbeitung | Fraisage

Frese ad alto rendimento
High-performance cutters | Hochleistungsfräser | Fraises haute performance

Codice prodotto Product code	Ø D mm	L.utile M.depth	Z Z	Cava Slotting	Contornatura Contour Milling	Finitura Finishing	Trocoidale Trochoidal	Fresatura a tuffo Plunging	Svasatura Chamfering	Sbavatura Deburing	Rampa Ramping	Int. Elicoidale Helical Int.	Miglior performance Best performance	Acciai Steel Stahl Acier P	Acciai Inox Stainless Steel Edelstahl Acier Inoxydable M	Ghise Cast Iron Gusseisen Fonte K	Metalli non ferrosi Non-ferrous metals NE-Metalle Matières non ferreuses N	HRSA - Titanio HRSA - Titanium HRSA - Titan HRSA - Titane S	Acciai Temprati Hardened Steel Gehärteter Stahl Acier trempé H	Non ISO Not ISO Keine ISO Pas d'ISO O	Pagina Page Seite Page	Parametri Working parameters Richtswerte Paramètres
TTM225E Available also with corner-radius geometry (TTM225T)	1,00 ÷ 6,00	3xD	2	●	●	-	-	●	-	-	●	●	**Inox, PH, titanio, CoCr** Stainless steel, PH, titanium, CoCr	◑	●	●	●	●	◑	◑	122	132
TTM250E Available also with corner-radius geometry (TTM250T)	1,00 ÷ 6,00	5xD	2	●	●	-	-	●	-	-	●	●	**Inox, PH, titanio, CoCr** Stainless steel, PH, titanium, CoCr	◑	●	●	●	●	◑	◑	123	133
TMR230E	0,50 ÷ 6,00	3xD	2	-	-	●	-	-	-	-	-	-	**Acciai, acciai temprati** Steel, hardened steel	●	◑	●	◑	●	●	◑	124	134
TMR250E	0,50 ÷ 6,00	5xD	2	-	-	●	-	-	-	-	-	-	**Acciai, acciai temprati** Steel, hardened steel	●	◑	●	◑	●	●	◑	125	135
MS320	0,30 ÷ 6,00	2xD	3	●	●	-	●	-	-	-	●	●	**Acciai, inox** Steel, stainless steel	●	●	◑	●	●	◑	◑	126	136
MS330	0,30 ÷ 6,00	3xD	3	●	●	-	●	-	-	-	●	●	**Acciai, inox** Steel, stainless steel	●	●	◑	●	●	◑	◑	127	136
TTM325E Available also with corner-radius geometry (TTM325T)	1,00 ÷ 6,00	3xD	3	●	●	-	●	●	-	-	●	●	**Inox, PH, titanio, CoCr** Stainless steel, PH, titanium, CoCr	◑	●	●	●	●	◑	◑	128	137
TTM350E Available also with corner-radius geometry (TTM350T)	1,00 ÷ 6,00	5xD	3	●	●	-	●	●	-	-	●	●	**Inox, PH, titanio, CoCr** Stainless steel, PH, titanium, CoCr	◑	●	●	●	●	◑	◑	129	138
TWF3	0,20 ÷ 1,00 T4/T30	3xD	Ø0.20-Ø0.30 = 3 Ø0.40-Ø1.00 = 4	●	●	-	-	-	-	-	-	●	**Inox, titanio, CoCr** Stainless steel, titanium, CoCr	◑	●	○	○	●	○	○	130	139
TWF5	0,20 ÷ 1,00 T4/T30	5xD	Ø0.20-Ø0.30 = 3 Ø0.40-Ø1.00 = 4	●	●	-	-	-	-	-	-	●	**Inox, titanio, CoCr** Stainless steel, titanium, CoCr	◑	●	○	○	●	○	○	131	139

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

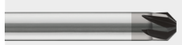
Frese
Cutters | Fräser | Fraises

Codice prodotto Product code	Ø D mm	Z Z	Cava Slotting	Contornatura Contour Milling	Finitura Finishing	Trocoidale Trochoidal	Fresatura a tuffo Plunging	Svasatura Chamfering	Sbavatura Deburing	Rampa Ramping	Int. Elicoidale Helical Int.	Miglior performance Best performance	Acciai Steel Stahl Acier P	Acciai Inox Stainless Steel Edelstahl Acier inoxydable M	Ghise Cast Iron Gusseisen Fonte K	Metalli non ferrosi Non-ferrous metals NE-Metalle Matières non ferreuses N	HRSA - Titanio HRSA - Titanium HRSA - Titan HRSA - Titane S	Acciai Temprati Hardened Steel Gehärteter Stahl Acier trempé H	Non ISO Not ISO Keine ISO Pas d'ISO O	Pagina Page Seite Page	Parametri Working parameters Richtswerte Paramètres
MS122	2,00 ÷ 20,00	2	●	●	-	-	●	-	-	●	●	**Acciai, inox** Steel, stainless steel	●	◑	◑	○	○	○	○	140	150
MS122XL	3,00 ÷ 20,00	2	●	●	-	-	●	-	-	●	●	**Acciai, inox** Steel, stainless steel	●	◑	◑	○	○	○	○	141	151
MS122XLS	4,00 ÷ 20,00	2	●	●	-	-	●	-	-	●	●	**Acciai, inox** Steel, stainless steel	●	◑	◑	○	○	○	○	141	152
MS123	2,00 ÷ 20,00	2	-	-	●	-	-	-	-	-	-	**Acciai, inox** Steel, stainless steel	●	◑	◑	○	○	○	○	142	153
MS123XL	3,00 ÷ 20,00	2	-	-	●	-	-	-	-	-	-	**Acciai, inox** Steel, stainless steel	●	◑	◑	○	○	○	○	143	154
MS123XLS	4,00 ÷ 20,00	2	-	-	●	-	-	-	-	-	-	**Acciai, inox** Steel, stainless steel	●	◑	◑	○	○	○	○	143	155
MS124	2,00 ÷ 20,00	2	●	●	-	-	●	-	-	●	●	**Alluminio** Aluminum	○	○	○	●	○	○	◑	144	156
MS131	2,00 ÷ 20,00	3	●	●	-	-	●	-	-	●	●	**Acciai, inox** Steel, stainless steel	●	◑	◑	○	○	○	○	146	157
MS131XL	3,00 ÷ 20,00	3	●	●	-	-	●	-	-	●	●	**Acciai, inox** Steel, stainless steel	●	◑	◑	○	○	○	○	147	158
MS131XLS	4,00 ÷ 20,00	3	●	●	-	-	●	-	-	●	●	**Acciai, inox** Steel, stainless steel	●	◑	◑	○	○	○	○	147	159
MS141	2,00 ÷ 20,00	4	●	●	-	●	-	-	-	-	-	**Acciai, inox** Steel, stainless steel	●	◑	◑	○	○	○	○	148	160
MS141XL	3,00 ÷ 20,00	4	●	●	-	●	-	-	-	-	-	**Acciai, inox** Steel, stainless steel	●	◑	◑	○	○	○	○	149	161
MS141XLS	4,00 ÷ 20,00	4	●	●	-	●	-	-	-	-	-	**Acciai, inox** Steel, stainless steel	●	◑	◑	○	○	○	○	149	162

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

SBAVATURA
Deburring | Entgraten | Ébavurage

Sbavatori
Chamfer tools | Fasenwerkzeuge | Outils de chanfrein

Codice prodotto Product code	Ø D mm	L.utile M.depth	Z Z	Cava Slotting	Contornatura Contour Milling	Finitura Finishing	Trocoidale Trochoidal	Fresatura a tuffo Plunging	Svasatura Chamfering	Sbavatura Deburing	Rampa Ramping	Int. Elicoidale Helical Int.	Miglior performance Best performance	Acciai Steel Stahl Acier P	Acciai inox Stainless Steel Edelstahl Acier Inoxydable M	Ghise Cast Iron Gusseisen Fonte K	Metalli non ferrosi Non-ferrous metals NE-Metalle Matières non ferreuses N	HRSA - Titanio HRSA - Titanium HRSA - Titan HRSA - Titane S	Acciai Temprati Hardened Steel Gehärteter Stahl Acier trempé H	Non ISO Not ISO Keine ISO Pas d'ISO O	Pagina Page Seite Page	Parametri Working parameters Richtswerte Paramètres
TTMCA90 	1,00 ÷ 6,00	3xD	Ø1.00-Ø2.00 = 4 Ø3.00 = 5 Ø4.00-Ø6.00 = 6	-	-	-	-	-	●	-	-	-	**Multi-materiale** Multi-material	●	●	●	●	●	○	◑	166	168
TTMCD90 	0,90 ÷ 5,70	3xD	Ø0.90 = 4 Ø1.40-Ø4.70 = 5 Ø5.70 = 6	-	-	-	-	-	●	-	-	-	**Multi-materiale** Multi-material	●	●	●	●	●	○	◑	166	169
TTMCR90 	1,00 ÷ 6,00	3xD	3	-	-	-	-	-	-	●	-	-	**Multi-materiale** Multi-material	●	●	●	●	●	○	◑	167	170

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

UTENSILI SPECIALI

Special tools | Sonderwerkzeuge | Outils spéciaux

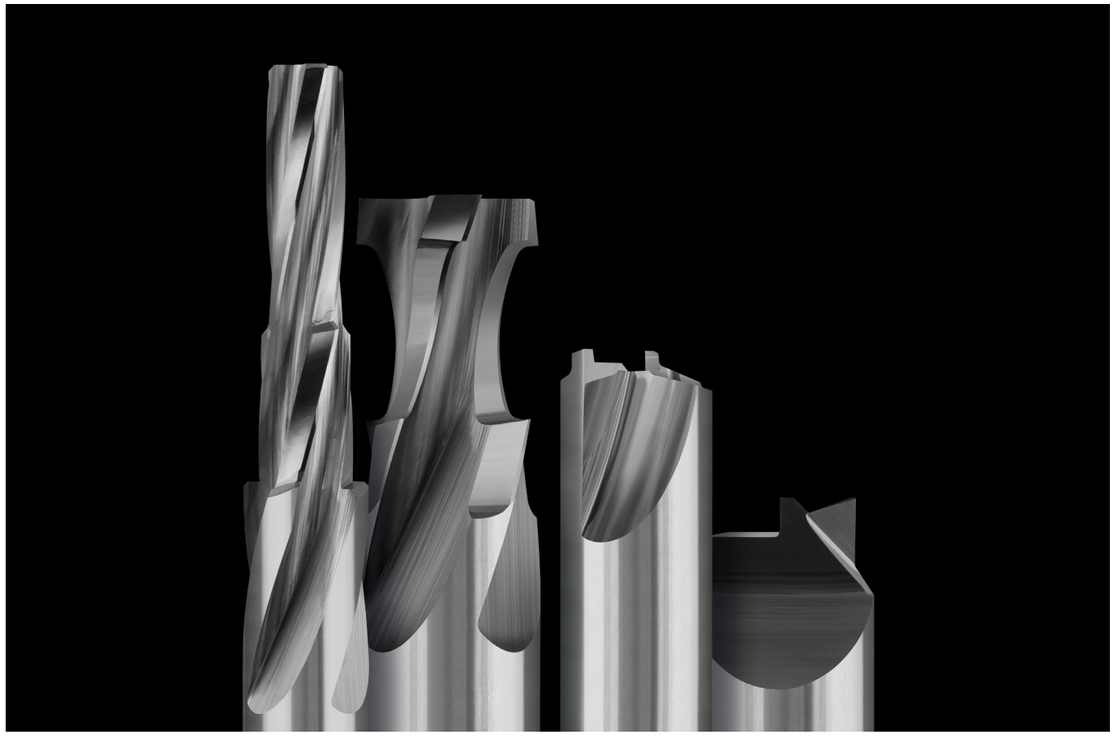
Utensili non standard realizzati su specifiche del cliente

Non-standard tools manufactured according to the customer's specific requirements

Utensili in metallo duro | HM Tools

176

Gamma di diametri Diameter range Durchmesserbereich Gamme de diamètres	**Tolleranza minima gestibile** Minimum manageable toleranc Minimal beherrschbare Toleranz Tolérance minimale gérable	**Concentricità nei diametri dei gambi** Concentricity in the shanks' diameters Konzentrizität der Schaftdurchmesser Concentricité des diamètres des tiges	**Materiali consigliati** Recommended materials Empfohlene Materialien Matériaux recommandés
0.10-18.00mm	+/-0.5µm	0.002mm	Multi-materiale Multi-material



Utensili in ceramica | Ceramic tools

178

Gamma di diametri Diameter range Durchmesserbereich Gamme de diamètres	**Tolleranza minima gestibile** Minimum manageable toleranc Minimal beherrschbare Toleranz Tolérance minimale gérable	**Concentricità nei diametri dei gambi** Concentricity in the shanks' diameters Konzentrizität der Schaftdurchmesser Concentricité des diamètres des tiges	**Materiali consigliati** Recommended materials Empfohlene Materialien Matériaux recommandés
0.30-3.00mm	+/-0.5µm	0.002mm	Metalli non ferrosi, HRSAs Non-ferrous metals, HRSAs



ACCESSORI E SERVIZI

Accessories and services | Zubehör und Dienstleistungen | Accessoires et services

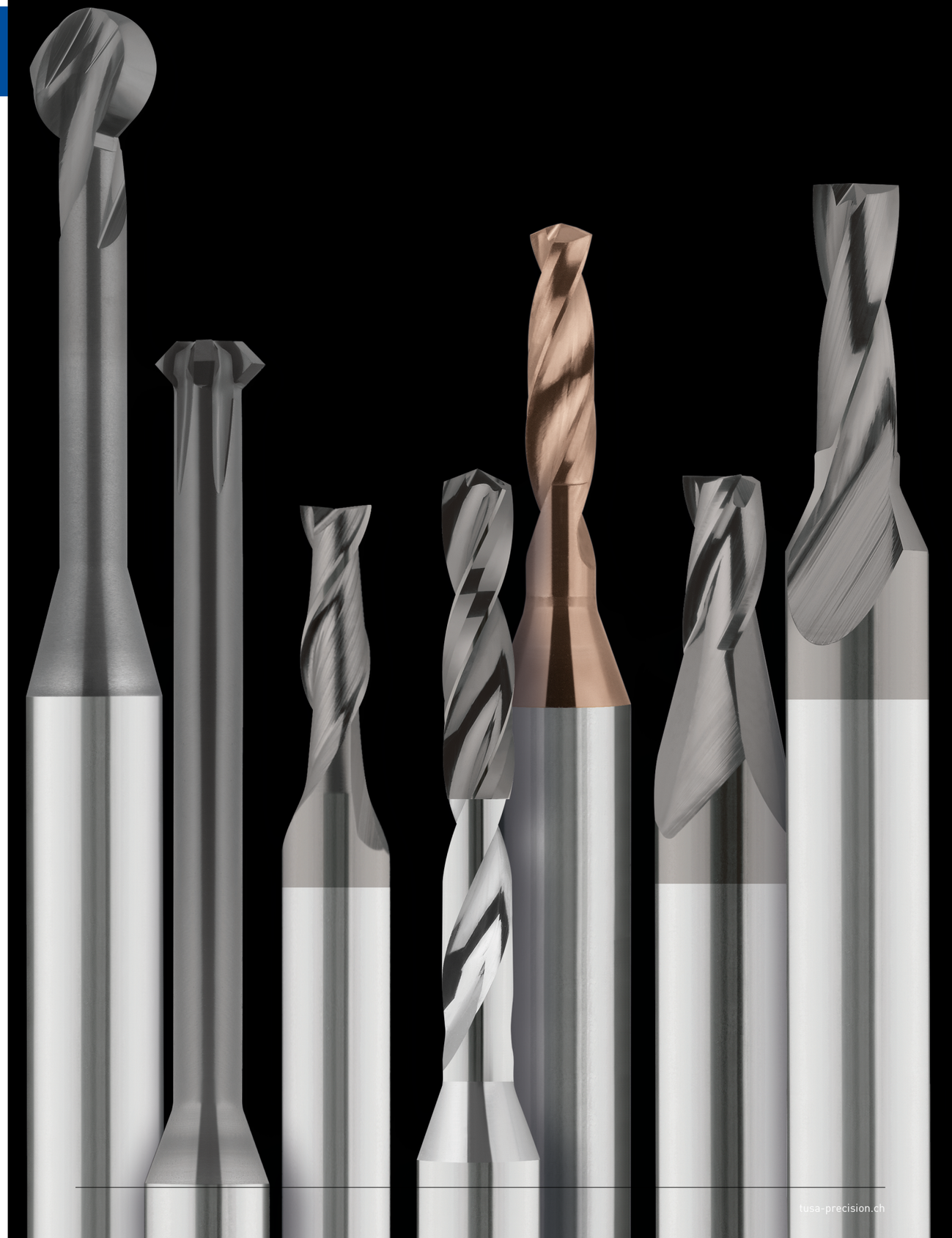
Accessori
Accessories | Zubehör | Accessoires — 182

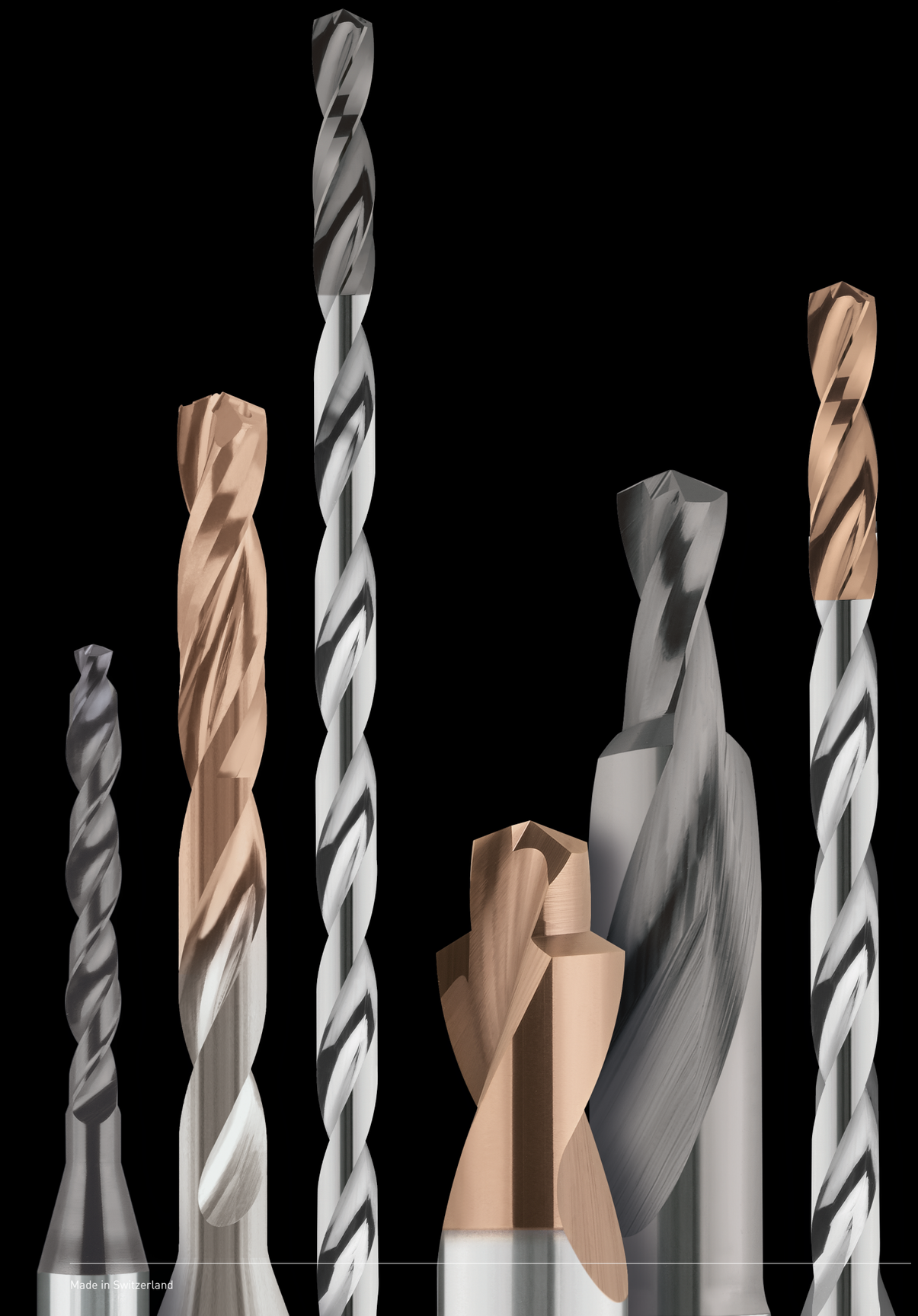
Buone pratiche di lavoro
Best working practice | Bewährte Arbeitspraktiken | Bonnes pratiques de travail — 183-185

- **Utensili con adduzione interna** | Tools with internal coolant holes | Werkzeuge mit Innenkühlung | Outils avec arrosage interne — 183
- **Consigli per l'ottimizzazione della lavorazione** | Recommendations for process optimization — 184
  Empfehlungen zur Prozessoptimierung | Recommandations pour l'optimisation du processus
- **Pressione consigliata** | Recommended pressure | Empfohlener Druck | Pression recommandée — 184
- **Processo per foratura ad alto rendimento** | Machining process for high performance drilling — 185
  Bearbeitungsverfahren Hochleistungsbohren | Procédé d'usinage à grand rendement

Servizi
Services | Dienstleistungen | Services — 186-187

- **Riaffilatura** | Regrinding | Nachschleifen | Réaffûtage — 186
- **Spedizioni in UE** | Delivery within the EU | Versand innerhalb der EU | Expéditions au sein de l'UE — 187





FORATURA
HOLE MAKING
BOHREN
PERÇAGE

PUNTE PILOTA
PILOT DRILLS

MTB27	**30**
MTB27E	**32**
TTD180E	**34**
TWP	**36**

PUNTE DA CENTRO
CENTERING DRILLS

MTB43	**42**
MTB44	**42**
MTB40	**43**
MTB41	**43**

PUNTE AD ALTO RENDIMENTO
HIGH-PERFORMANCE DRILLS

TTD203	**46**
TTD207	**48**
TTD204	**50**
TTD209	**52**
TTD215	**54**
TTD206E	**56**
TTD212E	**58**
TTD218E	**60**
TTD203S	**62**
TTD206S	**64**

PUNTE
DRILLS

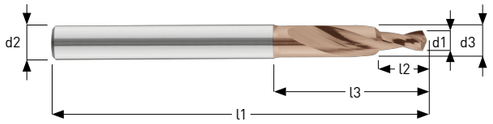
TA803	**76**
MTB25N	**80**
TA35	**84**
MTB25	**85**
MTB33	**88**
TA303B	**90**
TC35	**91**
MTB30	**92**
MTB35	**94**
MTB35L	**96**
MTB45	**98**
MTB50	**100**
MTB60	**102**

ALESATORI
REAMERS

MS402	**104**

MTB27

Punta pilota 140°
140° pilot drill
140° Pilot Bohrer
Foret pilote 140°



P M K N S H



2xD | Var | 90° | Z 2 | TUSA NORM

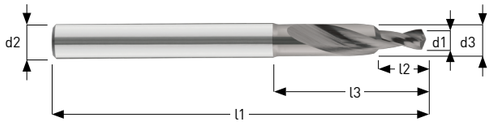
Art. Tusa Precision	d1 m5	d2 h6	d3 +/-0.02	l1 +/-0.2	l2 +/-0.2	l3 0/+0.5
MTB2700100	1,00	4,00	1,80	45	2,00	7,30
MTB2700105	1,05	4,00	1,80	45	2,10	7,70
MTB2700110	1,10	4,00	1,80	45	2,20	8,05
MTB2700115	1,15	4,00	1,80	45	2,30	8,40
MTB2700120	1,20	4,00	2,10	45	2,40	8,80
MTB2700125	1,25	4,00	2,10	45	2,50	9,15
MTB2700130	1,30	4,00	2,10	45	2,60	9,50
MTB2700135	1,35	4,00	2,10	45	2,70	9,90
MTB2700140	1,40	4,00	2,10	45	2,80	10,25
MTB2700145	1,45	4,00	2,45	45	2,90	10,60
MTB2700150	1,50	4,00	2,45	48	3,00	10,95
MTB2700155	1,55	4,00	2,45	48	3,10	11,35
MTB2700160	1,60	4,00	2,45	48	3,20	11,70
MTB2700165	1,65	4,00	2,45	48	3,30	12,05
MTB2700170	1,70	4,00	2,80	48	3,40	12,45
MTB2700175	1,75	4,00	2,80	48	3,50	12,80
MTB2700180	1,80	4,00	2,80	48	3,60	13,15
MTB2700185	1,85	4,00	2,80	48	3,70	13,55
MTB2700190	1,90	4,00	2,80	48	3,80	13,90
MTB2700195	1,95	4,00	2,80	48	3,90	14,25
MTB2700200	2,00	4,00	3,30	52	4,00	14,60
MTB2700205	2,05	4,00	3,30	52	4,10	15,00
MTB2700210	2,10	4,00	3,30	52	4,20	15,35
MTB2700215	2,15	4,00	3,30	52	4,30	15,70
MTB2700220	2,20	4,00	3,30	52	4,40	16,10
MTB2700225	2,25	4,00	3,30	52	4,50	16,45
MTB2700230	2,30	4,00	3,60	52	4,60	16,80
MTB2700235	2,35	4,00	3,60	52	4,70	17,20
MTB2700240	2,40	4,00	3,60	52	4,80	17,55
MTB2700245	2,45	4,00	3,60	52	4,90	17,90
MTB2700250	2,50	4,00	3,60	56	5,00	18,25
MTB2700255	2,55	4,00	3,60	56	5,10	18,65
MTB2700260	2,60	4,00	4,00	56	5,20	19,00
MTB2700265	2,65	4,00	4,00	56	5,30	19,35
MTB2700270	2,70	4,00	4,00	56	5,40	19,75
MTB2700275	2,75	4,00	4,00	56	5,50	20,10
MTB2700280	2,80	4,00	4,00	56	5,60	20,45
MTB2700285	2,85	4,00	4,00	56	5,70	20,85
MTB2700290	2,90	4,00	4,00	56	5,80	21,20
MTB2700295	2,95	4,00	4,00	56	5,90	21,55

Art. Tusa Precision	d1 m5	d2 h6	d3 +/-0.02	l1 +/-0.2	l2 +/-0.2	l3 0/+0.5
MTB2700300	3,00	6,00	4,80	60	6,00	21,90
MTB2700305	3,05	6,00	4,80	60	6,10	22,30
MTB2700310	3,10	6,00	4,80	60	6,20	22,65
MTB2700315	3,15	6,00	4,80	60	6,30	23,00
MTB2700320	3,20	6,00	4,80	60	6,40	23,40
MTB2700325	3,25	6,00	4,80	60	6,50	23,75
MTB2700330	3,30	6,00	4,80	60	6,60	24,10
MTB2700335	3,35	6,00	4,80	60	6,70	24,50
MTB2700340	3,40	6,00	4,80	60	6,80	24,85
MTB2700345	3,45	6,00	4,80	60	6,90	25,20
MTB2700350	3,50	6,00	5,50	65	7,00	25,55
MTB2700355	3,55	6,00	5,50	65	7,10	25,95
MTB2700360	3,60	6,00	5,50	65	7,20	26,30
MTB2700365	3,65	6,00	5,50	65	7,30	26,65
MTB2700370	3,70	6,00	5,50	65	7,40	27,05
MTB2700375	3,75	6,00	5,50	70	7,50	27,40
MTB2700380	3,80	6,00	5,50	70	7,60	27,75
MTB2700385	3,85	6,00	5,50	70	7,70	28,15
MTB2700390	3,90	6,00	5,50	70	7,80	28,50
MTB2700395	3,95	6,00	5,50	70	7,90	28,85
MTB2700400	4,00	6,00	5,50	70	8,00	29,20

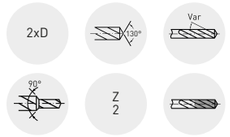
Notes

MTB27E

Punta pilota 130°
130° Pilot drill
130° Pilot Bohrer
Foret pilote 130°







P M K N S

Art. Tusa Precision	d1 m5	d2 h6	d3 +/-0.02	l1 +/-0.2	l2 +/-0.2	l3 0/+0.5
MTB2700100E	1,00	4,00	1,80	45	2,00	7,30
MTB2700105E	1,05	4,00	1,80	45	2,10	7,70
MTB2700110E	1,10	4,00	1,80	45	2,20	8,05
MTB2700115E	1,15	4,00	1,80	45	2,30	8,40
MTB2700120E	1,20	4,00	2,10	45	2,40	8,80
MTB2700125E	1,25	4,00	2,10	45	2,50	9,15
MTB2700130E	1,30	4,00	2,10	45	2,60	9,50
MTB2700135E	1,35	4,00	2,10	45	2,70	9,90
MTB2700140E	1,40	4,00	2,10	45	2,80	10,25
MTB2700145E	1,45	4,00	2,45	45	2,90	10,60
MTB2700150E	1,50	4,00	2,45	48	3,00	10,95
MTB2700155E	1,55	4,00	2,45	48	3,10	11,35
MTB2700160E	1,60	4,00	2,45	48	3,20	11,70
MTB2700165E	1,65	4,00	2,45	48	3,30	12,05
MTB2700170E	1,70	4,00	2,80	48	3,40	12,45
MTB2700175E	1,75	4,00	2,80	48	3,50	12,80
MTB2700180E	1,80	4,00	2,80	48	3,60	13,15
MTB2700185E	1,85	4,00	2,80	48	3,70	13,55
MTB2700190E	1,90	4,00	2,80	48	3,80	13,90
MTB2700195E	1,95	4,00	2,80	48	3,90	14,25
MTB2700200E	2,00	4,00	3,30	52	4,00	14,60
MTB2700205E	2,05	4,00	3,30	52	4,10	15,00
MTB2700210E	2,10	4,00	3,30	52	4,20	15,35
MTB2700215E	2,15	4,00	3,30	52	4,30	15,70
MTB2700220E	2,20	4,00	3,30	52	4,40	16,10
MTB2700225E	2,25	4,00	3,30	52	4,50	16,45
MTB2700230E	2,30	4,00	3,60	52	4,60	16,80
MTB2700235E	2,35	4,00	3,60	52	4,70	17,20
MTB2700240E	2,40	4,00	3,60	52	4,80	17,55
MTB2700245E	2,45	4,00	3,60	52	4,90	17,90
MTB2700250E	2,50	4,00	3,60	56	5,00	18,25
MTB2700255E	2,55	4,00	3,60	56	5,10	18,65
MTB2700260E	2,60	4,00	-	56	5,20	-
MTB2700265E	2,65	4,00	-	56	5,30	-
MTB2700270E	2,70	4,00	-	56	5,40	-
MTB2700275E	2,75	4,00	-	56	5,50	-
MTB2700280E	2,80	4,00	-	56	5,60	-
MTB2700285E	2,85	4,00	-	56	5,70	-
MTB2700290E	2,90	4,00	-	56	5,80	-
MTB2700295E	2,95	4,00	-	56	5,90	-

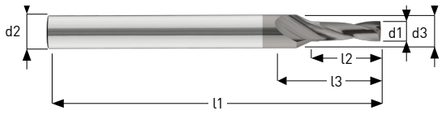
Art. Tusa Precision	d1 m5	d2 h6	d3 +/-0.02	l1 +/-0.2	l2 +/-0.2	l3 0/+0.5
MTB2700300E	3,00	6,00	4,80	60	6,00	21,90
MTB2700305E	3,05	6,00	4,80	60	6,10	22,30
MTB2700310E	3,10	6,00	4,80	60	6,20	22,65
MTB2700315E	3,15	6,00	4,80	60	6,30	23,00
MTB2700320E	3,20	6,00	4,80	60	6,40	23,40
MTB2700325E	3,25	6,00	4,80	60	6,50	23,75
MTB2700330E	3,30	6,00	4,80	60	6,60	24,10
MTB2700335E	3,35	6,00	4,80	60	6,70	24,50
MTB2700340E	3,40	6,00	4,80	60	6,80	24,85
MTB2700345E	3,45	6,00	4,80	60	6,90	25,20
MTB2700350E	3,50	6,00	5,50	65	7,00	25,55
MTB2700355E	3,55	6,00	5,50	65	7,10	25,95
MTB2700360E	3,60	6,00	5,50	65	7,20	26,30
MTB2700365E	3,65	6,00	5,50	65	7,30	26,65
MTB2700370E	3,70	6,00	5,50	65	7,40	27,05
MTB2700375E	3,75	6,00	5,50	70	7,50	27,40
MTB2700380E	3,80	6,00	5,50	70	7,60	27,75
MTB2700385E	3,85	6,00	5,50	70	7,70	28,15
MTB2700390E	3,90	6,00	5,50	70	7,80	28,50
MTB2700395E	3,95	6,00	5,50	70	7,90	28,85
MTB2700400E	4,00	6,00	5,50	70	8,00	29,20
MTB2700410E	4,10	6,00	6,00	75	8,20	-
MTB2700420E	4,20	6,00	6,00	75	8,40	-
MTB2700430E	4,30	6,00	6,00	75	8,60	-
MTB2700440E	4,40	6,00	6,00	75	8,80	-
MTB2700450E	4,50	6,00	6,00	75	9,00	-
MTB2700460E	4,60	6,00	6,00	75	9,20	-
MTB2700470E	4,70	6,00	6,00	75	9,40	-
MTB2700480E	4,80	6,00	6,00	75	9,60	-
MTB2700490E	4,90	6,00	6,00	75	9,80	-
MTB2700500E	5,00	8,00	8,00	80	10,00	-
MTB2700510E	5,10	8,00	8,00	80	10,20	-
MTB2700520E	5,20	8,00	8,00	80	10,40	-
MTB2700530E	5,30	8,00	8,00	80	10,60	-
MTB2700540E	5,40	8,00	8,00	80	10,80	-
MTB2700550E	5,50	8,00	8,00	80	11,00	-
MTB2700560E	5,60	8,00	8,00	80	11,20	-
MTB2700570E	5,70	8,00	8,00	80	11,40	-
MTB2700580E	5,80	8,00	8,00	80	11,60	-
MTB2700590E	5,90	8,00	8,00	80	11,80	-
MTB2700600E	6,00	8,00	8,00	80	12,00	-

Notes

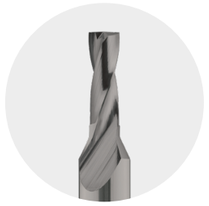
TTD180E

Punta pilota 180°
180° pilot drill
180° Pilotbohrer
Foret pilote 180°

3,5xD | 180° | Z 2 | TUSA NORM



P M K N S H

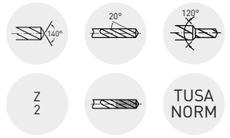


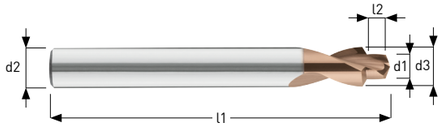
Art. Tusa Precision	d1 m5	d2 h6	d3 +/-0.02	l1 +/-0.2	l2 +/-0.5	l3 0/+0.2
TTD1800080E	0,80	4,00	1,70	40	2,80	6,00
TTD1800085E	0,85	4,00	1,70	40	3,00	6,00
TTD1800090E	0,90	4,00	1,80	40	3,20	6,30
TTD1800095E	0,95	4,00	1,90	40	3,30	6,70
TTD1800100E	1,00	4,00	2,00	40	3,50	7,00
TTD1800105E	1,05	4,00	2,10	40	3,70	7,40
TTD1800110E	1,10	4,00	2,20	40	3,90	7,70
TTD1800115E	1,15	4,00	2,30	40	4,00	8,10
TTD1800120E	1,20	4,00	2,40	40	4,20	8,40
TTD1800125E	1,25	4,00	2,50	40	4,40	8,80
TTD1800130E	1,30	4,00	2,60	40	4,60	9,10
TTD1800135E	1,35	4,00	2,70	40	4,70	9,50
TTD1800140E	1,40	4,00	2,80	40	4,90	9,80
TTD1800145E	1,45	4,00	2,90	40	5,10	10,20
TTD1800150E	1,50	4,00	3,00	40	5,30	10,50
TTD1800155E	1,55	4,00	3,05	40	5,40	10,70
TTD1800160E	1,60	4,00	3,10	40	5,60	10,90
TTD1800165E	1,65	4,00	3,15	40	5,80	11,00
TTD1800170E	1,70	4,00	3,20	40	6,00	11,20
TTD1800175E	1,75	4,00	3,25	40	6,10	11,40
TTD1800180E	1,80	4,00	3,30	40	6,30	11,60
TTD1800185E	1,85	4,00	3,35	40	6,50	11,70
TTD1800190E	1,90	4,00	3,40	40	6,70	11,90
TTD1800195E	1,95	4,00	3,45	40	6,80	12,10
TTD1800200E	2,00	6,00	3,50	50	7,00	12,30
TTD1800205E	2,05	6,00	3,55	50	7,20	12,40
TTD1800210E	2,10	6,00	3,60	50	7,40	12,60
TTD1800215E	2,15	6,00	3,65	50	7,50	12,80
TTD1800220E	2,20	6,00	3,70	50	7,70	13,00
TTD1800225E	2,25	6,00	3,75	50	7,90	13,10
TTD1800230E	2,30	6,00	3,80	50	8,10	13,30
TTD1800235E	2,35	6,00	3,85	50	8,20	13,50
TTD1800240E	2,40	6,00	3,90	50	8,40	13,70
TTD1800245E	2,45	6,00	3,95	50	8,60	13,80
TTD1800250E	2,50	6,00	4,00	50	8,80	14,00
TTD1800255E	2,55	6,00	4,05	50	8,90	14,20
TTD1800260E	2,60	6,00	4,10	50	9,10	14,40
TTD1800265E	2,65	6,00	4,15	50	9,30	14,50
TTD1800270E	2,70	6,00	4,20	50	9,40	14,70
TTD1800275E	2,75	6,00	4,25	50	9,60	14,90
TTD1800280E	2,80	6,00	4,30	50	9,80	15,10
TTD1800285E	2,85	6,00	4,35	50	10,00	15,20
TTD1800290E	2,90	6,00	4,40	50	1,00	15,40
TTD1800295E	2,95	6,00	4,45	50	10,30	15,60
TTD1800300E	3,00	6,00	4,50	60	10,50	15,80
TTD1800310E	3,10	6,00	4,60	60	10,90	16,10
TTD1800320E	3,20	6,00	4,70	60	11,20	16,50
TTD1800330E	3,30	6,00	4,80	60	11,60	16,80
TTD1800340E	3,40	6,00	4,90	60	11,90	17,20
TTD1800350E	3,50	6,00	5,00	60	12,30	17,50
TTD1800360E	3,60	6,00	-	60	12,60	-
TTD1800370E	3,70	6,00	-	60	13,00	-
TTD1800380E	3,80	6,00	-	60	13,30	-
TTD1800390E	3,90	6,00	-	60	13,70	-
TTD1800400E	4,00	6,00	-	60	14,00	-
TTD1800410E	4,10	6,00	-	60	14,40	-
TTD1800420E	4,20	6,00	-	60	14,70	-
TTD1800430E	4,30	6,00	-	60	15,10	-
TTD1800440E	4,40	6,00	-	60	15,40	-
TTD1800450E	4,50	6,00	-	60	15,80	-
TTD1800460E	4,60	6,00	-	60	16,10	-
TTD1800470E	4,70	6,00	-	60	16,50	-
TTD1800480E	4,80	6,00	-	60	16,80	-
TTD1800490E	4,90	6,00	-	60	17,20	-
TTD1800500E	5,00	6,00	-	60	17,50	-
TTD1800510E	5,10	8,00	-	70	17,90	-
TTD1800520E	5,20	8,00	-	70	18,20	-
TTD1800530E	5,30	8,00	-	70	18,60	-
TTD1800540E	5,40	8,00	-	70	18,90	-
TTD1800550E	5,50	8,00	-	70	19,30	-
TTD1800560E	5,60	8,00	-	70	19,60	-
TTD1800570E	5,70	8,00	-	70	20,00	-
TTD1800580E	5,80	8,00	-	70	20,30	-
TTD1800590E	5,90	8,00	-	70	20,70	-
TTD1800600E	6,00	8,00	-	70	21,00	-

Notes

TWP

Punta pilota Torx®
Torx® pilot drill
Torx® Pilotbohrer
Foret pilote Torx®







P M S

Art. Tusa Precision	Torx®	d1 +/- 0.01	d2 h5	d3 +/- 0.01	l1 0/+2	l2 +/- 0.01
TWP0000090	T4	0,90	3,00	2,20	39	0,54
TWP0000100	T5	1,00	3,00	2,20	39	0,70
TWP0000120	T6	1,20	3,00	2,30	39	0,84
TWP0000140	T7	1,40	3,00	3,00	39	0,80
TWP0000160	T8	1,60	3,00	3,00	39	1,12
TWP0000190	T10	1,90	4,00	4,00	50	1,07
TWP0000230	T15	2,30	4,00	4,00	50	1,38
TWP0000270	T20	2,70	6,00	5,00	50	1,66
TWP0000310	T25	3,10	6,00	6,00	50	2,28
TWP0000380	T30	3,80	6,00	6,00	50	2,83

Notes

Notes

MTB27

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçge

ISO Class	Cons | Adv	Velocità di taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 1.00-1.95	Ø 2.00-2.95	Ø 3.00-3.95	Ø 4,00
P00	●	60-90	0.025-0.04	0.04-0.055	0.055-0.07	0.07-0.1
P01	●	60-90	0.025-0.04	0.04-0.055	0.055-0.07	0.07-0.1
P02	●	60-90	0.025-0.04	0.04-0.055	0.055-0.07	0.07-0.1
P03	●	50-70	0.023-0.036	0.036-0.05	0.05-0.065	0.065-0.08
P04	●	40-60	0.015-0.025	0.025-0.04	0.04-0.055	0.055-0.07
P05	●	35-50	0.013-0.023	0.023-0.035	0.035-0.05	0.05-0.065
P06	●	35-50	0.013-0.023	0.023-0.035	0.035-0.05	0.05-0.065
M01	●	30-45	0.01-0.02	0.02-0.032	0.032-0.046	0.046-0.06
M02	●	30-45	0.01-0.02	0.02-0.032	0.032-0.046	0.046-0.06
M03	●	30-45	0.01-0.02	0.02-0.032	0.032-0.046	0.046-0.06
K01	●	100-150	0.025-0.038	0.038-0.055	0.055-0.075	0.075-0.13
K03	●	80-130	0.022-0.035	0.038-0.055	0.05-0.07	0.07-0.09
K02	●	80-130	0.022-0.035	0.038-0.055	0.05-0.07	0.07-0.09
N01	◑	90-120	0.025-0.035	0.035-0.05	0.05-0.07	0.07-0.085
N02	◑	120-150	0.027-0.042	0.042-0.06	0.06-0.08	0.08-0.11
N03	◑	120-150	0.025-0.035	0.035-0.05	0.05-0.07	0.07-0.085
N04	◑	120-150	0.025-0.035	0.035-0.05	0.05-0.07	0.07-0.1
S01	◑	15-25	0.02-0.03	0.04-0.05	0.06-0.07	0.07-0.08
S02	◑	30-40	0.045-0.06	0.07-0.08	0.09-0.10	0.10-0.11
S03	◑	15-25	0.02-0.03	0.04-0.05	0.06-0.07	0.07-0.08
S04	◑	40-70	0.022-0.035	0.035-0.05	0.05-0.07	0.07-0.09
H01	◑	20-35	0.01-0.02	0.02-0.03	0.03-0.04	0.04-0.055
H02	◑	20-35	0.01-0.02	0.02-0.03	0.03-0.04	0.04-0.055
H03	○	-	-	-	-	-
O01	◑	120-150	0.027-0.042	0.042-0.06	0.06-0.08	0.08-0.11
O02	○	-	-	-	-	-
O03	○	-	-	-	-	-
O04	○	-	-	-	-	-
O05	○	-	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

Made in Switzerland

MTB27E

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçge

ISO Class	Cons | Adv	Velocità di taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 1.00-1.95	Ø 2.00-2.95	Ø 3.00-3.95	Ø 4.00-6.00
P00	●	60-90	0.025-0.04	0.04-0.055	0.055-0.07	0.07-0.1
P01	●	60-90	0.025-0.04	0.04-0.055	0.055-0.07	0.07-0.1
P02	●	60-90	0.025-0.04	0.04-0.055	0.055-0.07	0.07-0.1
P03	●	50-70	0.023-0.036	0.036-0.05	0.05-0.065	0.065-0.08
P04	●	40-60	0.015-0.025	0.025-0.04	0.04-0.055	0.055-0.07
P05	●	35-50	0.013-0.023	0.023-0.035	0.035-0.05	0.05-0.065
P06	●	35-50	0.013-0.023	0.023-0.035	0.035-0.05	0.05-0.065
M01	●	30-45	0.01-0.02	0.02-0.032	0.032-0.046	0.046-0.06
M02	●	30-45	0.01-0.02	0.02-0.032	0.032-0.046	0.046-0.06
M03	●	30-45	0.01-0.02	0.02-0.032	0.032-0.046	0.046-0.06
K01	●	100-150	0.025-0.038	0.038-0.055	0.055-0.075	0.075-0.13
K03	●	80-130	0.022-0.035	0.038-0.055	0.05-0.07	0.07-0.09
K02	●	80-130	0.022-0.035	0.038-0.055	0.05-0.07	0.07-0.09
N01	◑	90-120	0.025-0.035	0.035-0.05	0.05-0.07	0.07-0.085
N02	◑	120-150	0.027-0.042	0.042-0.06	0.06-0.08	0.08-0.11
N03	◑	120-150	0.025-0.035	0.035-0.05	0.05-0.07	0.07-0.085
N04	◑	120-150	0.025-0.035	0.035-0.05	0.05-0.07	0.07-0.1
S01	◑	15-25	0.01-0.02	0.03-0.04	0.05-0.06	0.07-0.08
S02	◑	30-40	0.03-0.045	0.06-0.07	0.08-0.09	0.10-0.11
S03	◑	15-25	0.01-0.02	0.03-0.04	0.05-0.06	0.07-0.08
S04	◑	40-70	0.022-0.035	0.035-0.05	0.05-0.07	0.07-0.09
H01	○	-	-	-	-	-
H02	○	-	-	-	-	-
H03	○	-	-	-	-	-
O01	◑	120-150	0.027-0.042	0.042-0.06	0.06-0.08	0.08-0.11
O02	○	-	-	-	-	-
O03	○	-	-	-	-	-
O04	○	-	-	-	-	-
O05	○	-	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

TTD180E

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçge

ISO Class	Cons | Adv	Velocità di taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 0.80-1.00	Ø 1.05-1.45	Ø 1.50-2.00	Ø 2.05-2.45	Ø 2.50-3.00	Ø 3.10-3.50	Ø 3.60-4.00	Ø 4.10-4.50	Ø 4.60-5.00	Ø 5.10-5.50	Ø 5.60-6.00
P00	●	65-80	0.08-0.10	0.010-0.015	0.015-0.02	0.02-0.025	0.025-0.03	0.030-0.035	0.035-0.040	0.040-0.045	0.045-0.050	0.050-0.055	0.055-0.060
P01	●	65-80	0.08-0.10	0.010-0.015	0.015-0.02	0.02-0.025	0.025-0.03	0.030-0.035	0.035-0.040	0.040-0.045	0.045-0.050	0.050-0.055	0.055-0.060
P02	●	65-80	0.08-0.10	0.010-0.015	0.015-0.02	0.02-0.025	0.025-0.03	0.030-0.035	0.035-0.040	0.040-0.045	0.045-0.050	0.050-0.055	0.055-0.060
P03	●	50-60	0.006-0.008	0.008-0.013	0.013-0.018	0.018-0.023	0.023-0.028	0.028-0.033	0.033-0.038	0.038-0.043	0.043-0.048	0.048-0.053	0.048-0.053
P04	●	40-50	0.006 -0.008	0.008-0.013	0.013-0.018	0.018-0.023	0.023-0.028	0.028-0.033	0.033-0.038	0.038-0.043	0.043-0.048	0.048-0.053	0.048-0.053
P05	●	35-50	0.003-0.004	0.010-0.012	0.014-0.016	0.018-0.020	0.018-0.020	0.028-0.033	0.034-0.038	0.040-0.044	0.044-0.048	0.050-0.055	0.050-0.055
P06	●	35-50	0.003-0.004	0.005-0.006	0.007-0.008	0.009-0.010	0.009-0.010	0.014-0.016	0.017-0.019	0.020-0.022	0.022-0.024	0.026-0.028	0.026-0.028
M01	●	25-30	0.003-0.004	0.005-0.006	0.007-0.008	0.009-0.010	0.009-0.010	0.014-0.016	0.017-0.019	0.020-0.022	0.022-0.024	0.026-0.028	0.026-0.028
M02	●	25-30	0.003-0.004	0.005-0.006	0.007-0.008	0.009-0.010	0.009-0.010	0.014-0.016	0.017-0.019	0.020-0.022	0.022-0.024	0.026-0.028	0.026-0.028
M03	●	25-30	0.003-0.004	0.005-0.006	0.007-0.008	0.009-0.010	0.009-0.010	0.014-0.016	0.017-0.019	0.020-0.022	0.022-0.024	0.026-0.028	0.026-0.028
K01	●	70-80	0.008-0.010	0.010-0.015	0.015-0.02	0.02-0.025	0.025-0.03	0.030-0.035	0.035-0.040	0.040-0.045	0.045-0.050	0.050-0.055	0.055-0.060
K03	●	60-70	0.008-0.010	0.010-0.015	0.015-0.02	0.02-0.025	0.025-0.03	0.030-0.035	0.035-0.040	0.040-0.045	0.045-0.050	0.050-0.055	0.055-0.060
K02	●	60-70	0.008-0.010	0.010-0.015	0.015-0.02	0.02-0.025	0.025-0.03	0.030-0.035	0.035-0.040	0.040-0.045	0.045-0.050	0.050-0.055	0.055-0.060
N01	◑	115-125	0.010-0.015	0.015-0.020	0.020-0.025	0.025-0.035	0.035-0.045	0.045-0.055	0.055-0.065	0.065-0.075	0.075-0.085	0.085-0.095	0.095-0.011
N02	◑	115-125	0.010-0.015	0.015-0.020	0.020-0.025	0.025-0.035	0.035-0.045	0.045-0.055	0.055-0.065	0.065-0.075	0.075-0.085	0.085-0.095	0.095-0.011
N03	◑	115-125	0.010-0.015	0.015-0.020	0.020-0.025	0.025-0.035	0.035-0.045	0.045-0.055	0.055-0.065	0.065-0.075	0.075-0.085	0.085-0.095	0.095-0.011
N04	◑	65-100	0.006-0.015	0.008-0.020	0.013-0.025	0.018-0.035	0.023-0.045	0.028-0.055	0.033-0.065	0.038-0.075	0.043-0.085	0.048-0.095	0.048-0.11
S01	◑	15-20	0.002-0.003	0.004-0.005	0.006-0.007	0.008-0.009	0.010-0.011	0.012-0.013	0.014-0.015	0.016-0.017	0.018-0.019	0.020-0.022	0.020-0.022
S02	◑	15-20	0.003-0.004	0.005-0.006	0.007-0.008	0.009-0.010	0.009-0.010	0.014-0.016	0.017-0.019	0.020-0.022	0.022-0.024	0.026-0.028	0.026-0.028
S03	◑	15-20	0.002-0.003	0.004-0.005	0.006-0.007	0.008-0.009	0.010-0.011	0.012-0.013	0.014-0.015	0.016-0.017	0.018-0.019	0.020-0.022	0.020-0.022
S04	◑	20-30	0.006-0.008	0.010-0.012	0.014-0.016	0.018-0.020	0.022-0.026	0.028-0.032	0.034-0.038	0.040-0.044	0.044-0.048	0.050-0.055	0.050-0.055
H01	◑	15-20	0.002-0.003	0.004-0.005	0.006-0.007	0.008-0.009	0.010-0.011	0.012-0.013	0.014-0.015	0.016-0.017	0.018-0.019	0.020-0.022	0.020-0.022
H02	◑	15-20	0.002-0.003	0.004-0.005	0.006-0.007	0.008-0.009	0.010-0.011	0.012-0.013	0.014-0.015	0.016-0.017	0.018-0.019	0.020-0.022	0.020-0.022
H03	○	-	-	-	-	-	-	-	-	-	-	-	-
O01	◑	115-125	0.010-0.015	0.015-0.020	0.020-0.025	0.025-0.035	0.035-0.045	0.045-0.055	0.055-0.065	0.065-0.075	0.075-0.085	0.085-0.095	0.095-0.011
O02	○	-	-	-	-	-	-	-	-	-	-	-	-
O03	○	-	-	-	-	-	-	-	-	-	-	-	-
O04	○	-	-	-	-	-	-	-	-	-	-	-	-
O05	○	-	-	-	-	-	-	-	-	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

Made in Switzerland

TWP

Parametri indicativi per la foratura

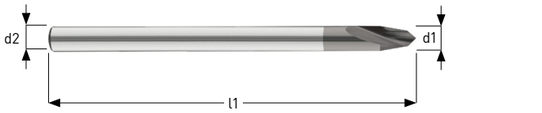
Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçge

ISO Class	Cons | Adv	Velocità di taglio m/min Cutting Speed m/min m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 0.90-1.60	Ø 1.90-2.30	Ø 2.70-3.80
P00	○	-	-	-	-
P01	○	-	-	-	-
P02	○	-	-	-	-
P03	○	-	-	-	-
P04	○	-	-	-	-
P05	●	20-30	0.020-0.035	0.040-0.060	0.060-0.080
P06	●	20-30	0.020-0.035	0.040-0.060	0.060-0.080
M01	●	20-30	0.020-0.035	0.040-0.060	0.060-0.080
M02	●	20-30	0.020-0.035	0.040-0.060	0.060-0.080
M03	●	20-30	0.020-0.035	0.040-0.060	0.060-0.080
K01	○	-	-	-	-
K03	○	-	-	-	-
K02	○	-	-	-	-
N01	○	-	-	-	-
N02	○	-	-	-	-
N03	○	-	-	-	-
N04	○	-	-	-	-
S01	●	20-30	0.010-0.020	0.020-0.030	0.030-0.060
S02	○	-	-	-	-
S03	●	20-30	0.010-0.020	0.020-0.030	0.030-0.060
S04	●	20-30	0.010-0.020	0.020-0.030	0.030-0.060
H01	○	-	-	-	-
H02	○	-	-	-	-
H03	○	-	-	-	-
O01	○	-	-	-	-
O02	○	-	-	-	-
O03	○	-	-	-	-
O04	○	-	-	-	-
O05	○	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

MTB43

Microcentrino 118°
118° micro-centering drill
118° Mikro-Zentrierbohrer
Micro-foret de centrage 118°



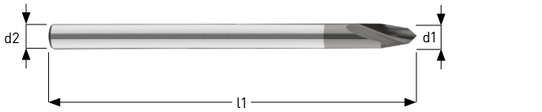
P M K N S H O



Art. Tusa Precision	d1 +/-0.03	d2 h6	l1 +/-0.2
MTB4300060	0,60	2,00	28
MTB4300120	1,20	2,00	28
MTB4300200	2,00	2,00	28

MTB44

Microcentrino 90°
90° micro-centering drill
90° Mikro-Zentrierbohrer
Micro-foret de centrage 90°



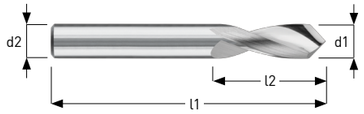
P M K N S H O



Art. Tusa Precision	d1 +/-0.03	d2 h6	l1 +/-0.2
MTB4400060	0,60	2,00	28
MTB4400120	1,20	2,00	28
MTB4400200	2,00	2,00	28

MTB40

Centrino 120°
120° centering drill
120° Zentrierbohrer
Foret de centrage 120°



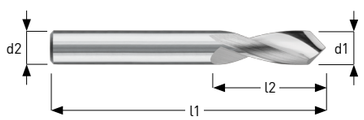
P M K N O



Art. Tusa Precision	d1 h6	d2 h6	l1 0/+1	l2 0/+1
MTB4000300	3,00	3,00	45	12,00
MTB4000400	4,00	4,00	50	15,00
MTB4000500	5,00	5,00	50	18,00
MTB4000600	6,00	6,00	50	21,00
MTB4000800	8,00	8,00	60	25,00
MTB4001000	10,00	10,00	70	27,00
MTB4001200	12,00	12,00	70	27,00
MTB4001400	14,00	14,00	75	30,00
MTB4001600	16,00	16,00	75	30,00

MTB41

Centrino 90°
90° centering drill
90° Zentrierbohrer
Foret de centrage 90°



P M K N O



Art. Tusa Precision	d1 h6	d2 h6	l1 0/+1	l2 0/+1
MTB4100300	3,00	3,00	45	12,00
MTB4100400	4,00	4,00	50	15,00
MTB4100500	5,00	5,00	50	18,00
MTB4100600	6,00	6,00	50	21,00
MTB4100800	8,00	8,00	60	25,00
MTB4101000	10,00	10,00	70	27,00
MTB4101200	12,00	12,00	70	27,00
MTB4101400	14,00	14,00	75	30,00
MTB4101600	16,00	16,00	75	30,00

MTB43 - MTB44

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçge

ISO Class	Cons | Adv	Velocità di taglio m/min Cutting Speed m/min Ø 0.60	Ø 1.20	Ø 2.00	Avanzamento mm/giro Cutting Feed mm/rev Ø 0.60	Ø 1.20	Ø 2.00
P00	●	20-35	35-50	35-50	0.010-0.03	0.03-0.05	0.03-0.05
P01	●	20-35	30-50	30-50	0.010-0.03	0.03-0.05	0.03-0.05
P02	●	20-35	30-50	30-50	0.010-0.03	0.03-0.05	0.03-0.05
P03	●	15-30	30-45	30-45	0.01-0.025	0.025-0.045	0.025-0.045
P04	●	12-25	25-40	25-40	0.01-0.02	0.02-0.04	0.02-0.04
P05	●	10-20	20-35	20-35	0.01-0.02	0.02-0.035	0.02-0.035
P06	●	10-20	20-35	20-35	0.01-0.02	0.02-0.035	0.02-0.035
M01	●	8-16	16-30	16-30	0.01-0.02	0.02-0.03	0.02-0.03
M02	●	8-16	16-30	16-30	0.01-0.02	0.02-0.03	0.02-0.03
M03	●	8-16	16-30	16-30	0.01-0.02	0.02-0.03	0.02-0.03
K01	◑	20-35	35-50	35-50	0.01-0.035	0.035-0.055	0.035-0.055
K03	◑	15-30	30-45	30-45	0.01-0.03	0.03-0.05	0.03-0.05
K02	◑	15-30	30-45	30-45	0.01-0.03	0.03-0.05	0.03-0.05
N01	●	35-50	50-65	50-65	0.02-0.04	0.04-0.06	0.04-0.06
N02	●	25-40	40-55	40-55	0.02-0.05	0.05-0.07	0.05-0.07
N03	●	20-35	35-50	35-50	0.02-0.04	0.04-0.06	0.04-0.06
N04	●	20-50	35-65	35-65	0.01-0.05	0.03-0.07	0.03-0.07
S01	●	10-15	15-25	15-25	0.01-0.02	0.02-0.035	0.02-0.035
S02	●	10-15	15-25	15-25	0.01-0.02	0.02-0.035	0.02-0.035
S03	●	10-15	15-25	15-25	0.01-0.02	0.02-0.035	0.02-0.035
S04	●	25-35	35-50	35-50	0.01-0.03	0.03-0.05	0.03-0.05
H01	●	10-15	15-25	15-25	0.01-0.02	0.02-0.03	0.02-0.03
H02	●	10-15	15-25	15-25	0.01-0.02	0.02-0.03	0.02-0.03
H03	◑	20-40	20-40	20-40	0.001-0.004	0.002-0.005	0.002-0.005
O01	●	20-35	30-45	30-45	0.02-0.05	0.05-0.075	0.05-0.075
O02	○	-	-	-	-	-	-
O03	○	-	-	-	-	-	-
O04	○	-	-	-	-	-	-
O05	○	-	-	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

MTB40 - MTB41

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçge

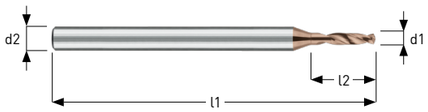
ISO Class	Cons | Adv	Velocità di taglio m/min Cutting Speed m/min Ø 3.00-16.00	Avanzamento mm/giro Cutting Feed mm/rev Ø 3.00-5.00	Ø 6.00-10.00	Ø 12.00-16.00
P00	●	25-40	0.12-0.25	0.25-0.3	0.3-0.4
P01	●	25-40	0.12-0.25	0.25-0.3	0.3-0.4
P02	●	25-40	0.12-0.25	0.25-0.3	0.3-0.4
P03	●	20-35	0.1-0.2	0.2-0.25	0.25-0.3
P04	○	-	-	-	-
P05	◑	10-20	0.05-0.15	0.15-0.2	0.2-0.25
P06	◑	10-20	0.05-0.15	0.15-0.2	0.2-0.25
M01	◑	8-16	0.04-0.08	0.08-0.14	0.14-0.2
M02	◑	8-16	0.04-0.08	0.08-0.14	0.14-0.2
M03	◑	8-16	0.04-0.08	0.08-0.14	0.14-0.2
K01	◑	25-40	0.07-0.15	0.15-0.2	0.2-0.35
K03	◑	20-35	0.05-0.1	0.1-0.15	0.15-0.25
K02	◑	20-35	0.05-0.1	0.1-0.15	0.15-0.25
N01	●	45-60	0.1-0.25	0.25-0.35	0.35-0.4
N02	●	30-45	0.15-0.3	0.3-0.4	0.4-0.6
N03	●	25-40	0.1-0.25	0.25-0.35	0.35-0.55
N04	●	25-60	0.06-0.25	0.1-0.35	0.15-0.45
S01	○	-	-	-	-
S02	○	-	-	-	-
S03	○	-	-	-	-
S04	◑	30-45	0.04-0.15	0.15-0.2	0.2-0.3
H01	○	-	-	-	-
H02	○	-	-	-	-
H03	○	-	-	-	-
O01	●	30-45	0.1-0.25	0.25-0.4	0.4-0.8
O02	○	-	-	-	-
O03	○	-	-	-	-
O04	○	-	-	-	-
O05	○	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

TTD203

Punta elicoidale senza canalini di raffreddamento interni
Twist drill without internal coolant holes
Spiralbohrer ohne innere Kühlkanälen
Foret hélicoïdal sans arrosage interne

3xD | 140° | 25° | Z 2 | TUSA NORM





P M K N S H

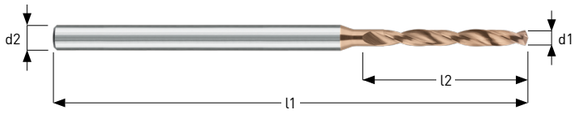
Art. Tusa Precision	d1 k5	d2 h6	l1 +/-0.2	l2 0/+0.5
TTD2030100	1,00	3,00	44	5,25
TTD2030105	1,05	3,00	44	5,55
TTD2030110	1,10	3,00	44	5,80
TTD2030115	1,15	3,00	44	6,05
TTD2030120	1,20	3,00	44	6,30
TTD2030125	1,25	3,00	44	6,60
TTD2030130	1,30	3,00	44	6,85
TTD2030135	1,35	3,00	44	7,10
TTD2030140	1,40	3,00	44	7,35
TTD2030145	1,45	3,00	44	7,65
TTD2030150	1,50	3,00	44	7,90
TTD2030155	1,55	3,00	44	8,15
TTD2030160	1,60	3,00	44	8,40
TTD2030165	1,65	3,00	44	8,70
TTD2030170	1,70	3,00	44	8,95
TTD2030175	1,75	3,00	44	9,20
TTD2030180	1,80	3,00	44	9,45
TTD2030185	1,85	3,00	44	9,75
TTD2030190	1,90	3,00	44	10,00
TTD2030195	1,95	3,00	44	10,25
TTD2030200	2,00	4,00	53	10,50
TTD2030205	2,05	4,00	53	10,80
TTD2030210	2,10	4,00	53	11,05
TTD2030215	2,15	4,00	53	11,30
TTD2030220	2,20	4,00	53	11,55
TTD2030225	2,25	4,00	53	11,85
TTD2030230	2,30	4,00	53	12,10
TTD2030235	2,35	4,00	53	12,35
TTD2030240	2,40	4,00	53	12,60
TTD2030245	2,45	4,00	53	12,90
TTD2030250	2,50	4,00	53	13,15
TTD2030255	2,55	4,00	53	13,40
TTD2030260	2,60	4,00	53	13,65
TTD2030265	2,65	4,00	53	13,95
TTD2030270	2,70	4,00	53	14,20
TTD2030275	2,75	4,00	53	14,45
TTD2030280	2,80	4,00	53	14,70
TTD2030285	2,85	4,00	53	15,00
TTD2030290	2,90	4,00	53	15,25
TTD2030295	2,95	4,00	53	15,50
TTD2030300	3,00	6,00	60	15,75
TTD2030305	3,05	6,00	60	16,05
TTD2030310	3,10	6,00	60	16,30
TTD2030315	3,15	6,00	60	16,55
TTD2030320	3,20	6,00	60	16,80
TTD2030325	3,25	6,00	60	17,10
TTD2030330	3,30	6,00	60	17,35
TTD2030335	3,35	6,00	60	17,60
TTD2030340	3,40	6,00	60	17,85
TTD2030345	3,45	6,00	60	18,15
TTD2030350	3,50	6,00	60	18,40
TTD2030355	3,55	6,00	60	18,65
TTD2030360	3,60	6,00	60	18,90
TTD2030365	3,65	6,00	60	19,20
TTD2030370	3,70	6,00	60	19,45
TTD2030375	3,75	6,00	60	19,70
TTD2030380	3,80	6,00	60	19,95
TTD2030385	3,85	6,00	60	20,25
TTD2030390	3,90	6,00	60	20,50
TTD2030395	3,95	6,00	60	20,75
TTD2030400	4,00	6,00	60	21,00

Notes

TTD207

Punta elicoidale senza canalini di raffreddamento interni
Twist drill without internal coolant holes
Spiralbohrer ohne innere Kühlkanälen
Foret hélicoïdal sans arrosage interne

7xD | 140° | 25° | Z 2 | TUSA NORM





P M K N S H

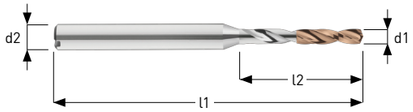
Art. Tusa Precision	d1 k5	d2 h6	l1 +/-0.2	l2 0/+0.5
TTD2070100	1,00	3,00	53	9,25
TTD2070105	1,05	3,00	53	9,75
TTD2070110	1,10	3,00	53	10,20
TTD2070115	1,15	3,00	53	10,65
TTD2070120	1,20	3,00	53	11,10
TTD2070125	1,25	3,00	53	11,60
TTD2070130	1,30	3,00	53	12,05
TTD2070135	1,35	3,00	53	12,50
TTD2070140	1,40	3,00	53	12,95
TTD2070145	1,45	3,00	53	13,45
TTD2070150	1,50	3,00	53	13,90
TTD2070155	1,55	3,00	53	14,35
TTD2070160	1,60	3,00	53	14,80
TTD2070165	1,65	3,00	53	15,30
TTD2070170	1,70	3,00	53	15,75
TTD2070175	1,75	3,00	53	16,20
TTD2070180	1,80	3,00	53	16,65
TTD2070185	1,85	3,00	53	17,15
TTD2070190	1,90	3,00	53	17,60
TTD2070195	1,95	3,00	53	18,05
TTD2070200	2,00	4,00	60	18,50
TTD2070205	2,05	4,00	60	19,00
TTD2070210	2,10	4,00	60	19,45
TTD2070215	2,15	4,00	60	19,90
TTD2070220	2,20	4,00	60	20,35
TTD2070225	2,25	4,00	60	20,85
TTD2070230	2,30	4,00	60	21,30
TTD2070235	2,35	4,00	60	21,75
TTD2070240	2,40	4,00	60	22,20
TTD2070245	2,45	4,00	60	22,70
TTD2070250	2,50	4,00	60	23,15
TTD2070255	2,55	4,00	60	23,60
TTD2070260	2,60	4,00	60	24,05
TTD2070265	2,65	4,00	60	24,55
TTD2070270	2,70	4,00	60	25,00
TTD2070275	2,75	4,00	60	25,45
TTD2070280	2,80	4,00	60	25,90
TTD2070285	2,85	4,00	60	26,40
TTD2070290	2,90	4,00	60	26,85
TTD2070295	2,95	4,00	60	27,30
TTD2070300	3,00	6,00	70	27,75
TTD2070305	3,05	6,00	70	28,25
TTD2070310	3,10	6,00	70	28,70
TTD2070315	3,15	6,00	70	29,15
TTD2070320	3,20	6,00	70	29,60
TTD2070325	3,25	6,00	70	30,10
TTD2070330	3,30	6,00	70	30,55
TTD2070335	3,35	6,00	70	31,00
TTD2070340	3,40	6,00	70	31,45
TTD2070345	3,45	6,00	70	31,95
TTD2070350	3,50	6,00	70	32,40
TTD2070355	3,55	6,00	70	32,85
TTD2070360	3,60	6,00	70	33,30
TTD2070365	3,65	6,00	70	33,80
TTD2070370	3,70	6,00	70	34,25
TTD2070375	3,75	6,00	70	34,70
TTD2070380	3,80	6,00	70	35,15
TTD2070385	3,85	6,00	70	35,65
TTD2070390	3,90	6,00	70	36,10
TTD2070395	3,95	6,00	70	36,55
TTD2070400	4,00	6,00	70	37,00

Notes

TTD204

Punta elicoidale con canalini di raffreddamento interni
Twist drill with internal coolant holes
Spiralbohrer mit inneren Kühlkanälen
Foret hélicoïdal avec arrosage interne

4xD | 140° | Z 2 | TUSA NORM



P M K N S H



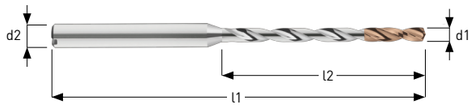
Art. Tusa Precision	d1 k5	d2 h6	l1 +/-0.2	l2 0/+0.5
TTD2040100	1,00	3,00	38	6,25
TTD2040105	1,05	3,00	38	6,60
TTD2040110	1,10	3,00	38	6,90
TTD2040115	1,15	3,00	38	7,20
TTD2040120	1,20	3,00	38	7,50
TTD2040125	1,25	3,00	38	7,85
TTD2040130	1,30	3,00	42	8,15
TTD2040135	1,35	3,00	42	8,45
TTD2040140	1,40	3,00	42	8,75
TTD2040145	1,45	3,00	42	9,10
TTD2040150	1,50	3,00	42	9,40
TTD2040155	1,55	3,00	44	9,70
TTD2040160	1,60	3,00	44	10,00
TTD2040165	1,65	3,00	44	10,35
TTD2040170	1,70	3,00	44	10,65
TTD2040175	1,75	3,00	44	10,95
TTD2040180	1,80	3,00	46	11,25
TTD2040185	1,85	3,00	46	11,60
TTD2040190	1,90	3,00	46	11,90
TTD2040195	1,95	3,00	46	12,20
TTD2040200	2,00	4,00	46	12,50
TTD2040205	2,05	4,00	48	12,85
TTD2040210	2,10	4,00	48	13,15
TTD2040215	2,15	4,00	48	13,45
TTD2040220	2,20	4,00	48	13,75
TTD2040225	2,25	4,00	48	14,10
TTD2040230	2,30	4,00	53	14,40
TTD2040235	2,35	4,00	53	14,70
TTD2040240	2,40	4,00	53	15,00
TTD2040245	2,45	4,00	53	15,35
TTD2040250	2,50	4,00	53	15,65
TTD2040255	2,55	4,00	53	15,95
TTD2040260	2,60	4,00	53	16,25
TTD2040265	2,65	4,00	53	16,60
TTD2040270	2,70	4,00	53	16,90
TTD2040275	2,75	4,00	55	17,20
TTD2040280	2,80	4,00	55	17,50
TTD2040285	2,85	4,00	55	17,85
TTD2040290	2,90	4,00	55	18,15
TTD2040295	2,95	4,00	58	18,45
TTD2040300	3,00	6,00	58	18,75
TTD2040305	3,05	6,00	58	19,10
TTD2040310	3,10	6,00	58	19,40
TTD2040315	3,15	6,00	58	19,70
TTD2040320	3,20	6,00	58	20,00
TTD2040325	3,25	6,00	58	20,35
TTD2040330	3,30	6,00	60	20,65
TTD2040335	3,35	6,00	60	20,95
TTD2040340	3,40	6,00	60	21,25
TTD2040345	3,45	6,00	60	21,60
TTD2040350	3,50	6,00	60	21,90
TTD2040355	3,55	6,00	63	22,20
TTD2040360	3,60	6,00	63	22,50
TTD2040365	3,65	6,00	63	22,85
TTD2040370	3,70	6,00	63	23,15
TTD2040375	3,75	6,00	63	23,45
TTD2040380	3,80	6,00	65	23,75
TTD2040385	3,85	6,00	65	24,10
TTD2040390	3,90	6,00	65	24,40
TTD2040395	3,95	6,00	65	24,70
TTD2040400	4,00	6,00	65	25,00

Notes

TTD209

Punta elicoidale con canalini di raffreddamento interni
Twist drill with internal coolant holes
Spiralbohrer mit inneren Kühlkanälen
Foret hélicoïdal avec arrosage interne

9xD | 140° | Z 2 | TUSA NORM



P M K N S H



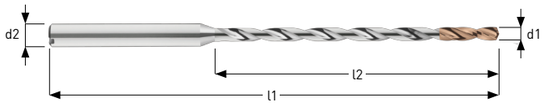
Art. Tusa Precision	d1 k5	d2 h6	l1 +/-0.2	l2 0/+0.5
TTD2090100	1,00	3,00	45	11,25
TTD2090105	1,05	3,00	45	11,85
TTD2090110	1,10	3,00	45	12,40
TTD2090115	1,15	3,00	45	12,95
TTD2090120	1,20	3,00	45	13,50
TTD2090125	1,25	3,00	45	14,10
TTD2090130	1,30	3,00	48	14,65
TTD2090135	1,35	3,00	48	15,20
TTD2090140	1,40	3,00	48	15,75
TTD2090145	1,45	3,00	48	16,35
TTD2090150	1,50	3,00	48	16,90
TTD2090155	1,55	3,00	51	17,45
TTD2090160	1,60	3,00	51	18,00
TTD2090165	1,65	3,00	51	18,60
TTD2090170	1,70	3,00	51	19,15
TTD2090175	1,75	3,00	51	19,70
TTD2090180	1,80	3,00	53	20,25
TTD2090185	1,85	3,00	53	20,85
TTD2090190	1,90	3,00	53	21,40
TTD2090195	1,95	3,00	53	21,95
TTD2090200	2,00	4,00	53	22,50
TTD2090205	2,05	4,00	55	23,10
TTD2090210	2,10	4,00	55	23,65
TTD2090215	2,15	4,00	55	24,20
TTD2090220	2,20	4,00	55	24,75
TTD2090225	2,25	4,00	55	25,35
TTD2090230	2,30	4,00	60	25,90
TTD2090235	2,35	4,00	60	26,45
TTD2090240	2,40	4,00	60	27,00
TTD2090245	2,45	4,00	60	27,60
TTD2090250	2,50	4,00	60	28,15
TTD2090255	2,55	4,00	65	28,70
TTD2090260	2,60	4,00	65	29,25
TTD2090265	2,65	4,00	65	29,85
TTD2090270	2,70	4,00	65	30,40
TTD2090275	2,75	4,00	65	30,95
TTD2090280	2,80	4,00	70	31,50
TTD2090285	2,85	4,00	70	32,10
TTD2090290	2,90	4,00	70	32,65
TTD2090295	2,95	4,00	75	33,20
TTD2090300	3,00	6,00	75	33,75
TTD2090305	3,05	6,00	75	34,35
TTD2090310	3,10	6,00	75	34,90
TTD2090315	3,15	6,00	75	35,45
TTD2090320	3,20	6,00	75	36,00
TTD2090325	3,25	6,00	75	36,60
TTD2090330	3,30	6,00	80	37,15
TTD2090335	3,35	6,00	80	37,70
TTD2090340	3,40	6,00	80	38,25
TTD2090345	3,45	6,00	80	38,85
TTD2090350	3,50	6,00	80	39,40
TTD2090355	3,55	6,00	85	39,95
TTD2090360	3,60	6,00	85	40,50
TTD2090365	3,65	6,00	85	41,10
TTD2090370	3,70	6,00	85	41,65
TTD2090375	3,75	6,00	85	42,20
TTD2090380	3,80	6,00	90	42,75
TTD2090385	3,85	6,00	90	43,35
TTD2090390	3,90	6,00	90	43,90
TTD2090395	3,95	6,00	90	44,45
TTD2090400	4,00	6,00	90	45,00

Notes

TTD215

Punta elicoidale con canalini di raffreddamento interni
Twist drill with internal coolant holes
Spiralbohrer mit inneren Kühlkanälen
Foret hélicoïdal avec arrosage interne

15xD | 140° | Z 2 | TUSA NORM



P M K N S H



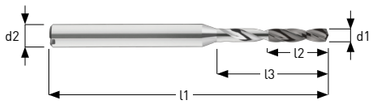
Art. Tusa Precision	d1 k5	d2 h6	l1 +/-0.2	l2 0/+0.5
TTD2150100	1,00	3,00	54	17,25
TTD2150105	1,05	3,00	54	18,15
TTD2150110	1,10	3,00	54	19,00
TTD2150115	1,15	3,00	54	19,85
TTD2150120	1,20	3,00	54	20,70
TTD2150125	1,25	3,00	54	21,60
TTD2150130	1,30	3,00	60	22,45
TTD2150135	1,35	3,00	60	23,30
TTD2150140	1,40	3,00	60	24,15
TTD2150145	1,45	3,00	60	25,05
TTD2150150	1,50	3,00	60	25,90
TTD2150155	1,55	3,00	65	26,75
TTD2150160	1,60	3,00	65	27,60
TTD2150165	1,65	3,00	65	28,50
TTD2150170	1,70	3,00	65	29,35
TTD2150175	1,75	3,00	65	30,20
TTD2150180	1,80	3,00	70	31,05
TTD2150185	1,85	3,00	70	31,95
TTD2150190	1,90	3,00	70	32,80
TTD2150195	1,95	3,00	70	33,65
TTD2150200	2,00	4,00	70	34,50
TTD2150205	2,05	4,00	75	35,40
TTD2150210	2,10	4,00	75	36,25
TTD2150215	2,15	4,00	75	37,10
TTD2150220	2,20	4,00	75	37,95
TTD2150225	2,25	4,00	75	38,85
TTD2150230	2,30	4,00	78	39,70
TTD2150235	2,35	4,00	78	40,55
TTD2150240	2,40	4,00	78	41,40
TTD2150245	2,45	4,00	78	42,30
TTD2150250	2,50	4,00	78	43,15
TTD2150255	2,55	4,00	83	44,00
TTD2150260	2,60	4,00	83	44,85
TTD2150265	2,65	4,00	83	45,75
TTD2150270	2,70	4,00	83	46,60
TTD2150275	2,75	4,00	83	47,45
TTD2150280	2,80	4,00	88	48,30
TTD2150285	2,85	4,00	88	49,20
TTD2150290	2,90	4,00	88	50,05
TTD2150295	2,95	4,00	88	50,90
TTD2150300	3,00	6,00	93	51,75
TTD2150305	3,05	6,00	93	52,65
TTD2150310	3,10	6,00	93	53,50
TTD2150315	3,15	6,00	93	54,35
TTD2150320	3,20	6,00	93	55,20
TTD2150325	3,25	6,00	93	56,10
TTD2150330	3,30	6,00	98	56,95
TTD2150335	3,35	6,00	98	57,80
TTD2150340	3,40	6,00	98	58,65
TTD2150345	3,45	6,00	98	59,55
TTD2150350	3,50	6,00	98	60,40
TTD2150355	3,55	6,00	103	61,25
TTD2150360	3,60	6,00	103	62,10
TTD2150365	3,65	6,00	103	63,00
TTD2150370	3,70	6,00	103	63,85
TTD2150375	3,75	6,00	103	64,70
TTD2150380	3,80	6,00	108	65,55
TTD2150385	3,85	6,00	108	66,45
TTD2150390	3,90	6,00	108	67,30
TTD2150395	3,95	6,00	108	68,15
TTD2150400	4,00	6,00	108	69,00

Notes

TTD206E

Punta elicoidale con canalini di raffreddamento interni
Twist drill with internal coolant holes
Spiralbohrer mit inneren Kühlkanälen
Foret hélicoïdal avec arrosage interne

6xD | 30° | Z 2 | TUSA NORM





P M K N S H

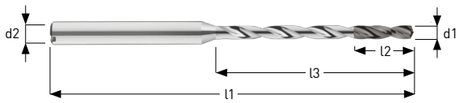
Art. Tusa Precision	d1 k5	d2 h6	l1 +/-0.2	l2 0/+0.5	l3 0/+0.5
TTD2060100E	1,00	3,00	50	4,40	9,30
TTD2060105E	1,05	3,00	50	4,65	9,80
TTD2060110E	1,10	3,00	50	4,85	10,25
TTD2060115E	1,15	3,00	50	5,10	10,70
TTD2060120E	1,20	3,00	50	5,30	11,20
TTD2060125E	1,25	3,00	50	5,50	11,65
TTD2060130E	1,30	3,00	52	5,75	12,10
TTD2060135E	1,35	3,00	52	5,95	12,60
TTD2060140E	1,40	3,00	52	6,20	13,05
TTD2060145E	1,45	3,00	52	6,40	13,50
TTD2060150E	1,50	3,00	52	6,60	13,95
TTD2060155E	1,55	3,00	55	6,85	14,45
TTD2060160E	1,60	3,00	55	7,05	14,90
TTD2060165E	1,65	3,00	55	7,30	15,35
TTD2060170E	1,70	3,00	55	7,50	15,85
TTD2060175E	1,75	3,00	55	7,70	16,30
TTD2060180E	1,80	3,00	57	7,95	16,75
TTD2060185E	1,85	3,00	57	8,15	17,25
TTD2060190E	1,90	3,00	57	8,40	17,70
TTD2060195E	1,95	3,00	57	8,60	18,15
TTD2060200E	2,00	4,00	57	8,80	18,60
TTD2060205E	2,05	4,00	60	9,05	19,10
TTD2060210E	2,10	4,00	60	9,25	19,55
TTD2060215E	2,15	4,00	60	9,50	20,00
TTD2060220E	2,20	4,00	60	9,70	20,50
TTD2060225E	2,25	4,00	60	9,90	20,95
TTD2060230E	2,30	4,00	62	10,15	21,40
TTD2060235E	2,35	4,00	62	10,35	21,90
TTD2060240E	2,40	4,00	62	10,60	22,35
TTD2060245E	2,45	4,00	62	10,80	22,80
TTD2060250E	2,50	4,00	62	11,00	23,25
TTD2060255E	2,55	4,00	65	11,25	23,75
TTD2060260E	2,60	4,00	65	11,45	24,20
TTD2060265E	2,65	4,00	65	11,70	24,65
TTD2060270E	2,70	4,00	65	11,90	25,15
TTD2060275E	2,75	4,00	65	12,10	25,60
TTD2060280E	2,80	4,00	67	12,35	26,05
TTD2060285E	2,85	4,00	67	12,55	26,55
TTD2060290E	2,90	4,00	67	12,80	27,00
TTD2060295E	2,95	4,00	67	13,00	27,45
TTD2060300E	3,00	6,00	70	13,20	27,90
TTD2060305E	3,05	6,00	70	13,45	28,40
TTD2060310E	3,10	6,00	70	13,65	28,85
TTD2060315E	3,15	6,00	70	13,90	29,30
TTD2060320E	3,20	6,00	70	14,10	29,80
TTD2060325E	3,25	6,00	70	14,30	30,25
TTD2060330E	3,30	6,00	72	14,55	30,70
TTD2060335E	3,35	6,00	72	14,75	31,20
TTD2060340E	3,40	6,00	72	15,00	31,65
TTD2060345E	3,45	6,00	72	15,20	32,10
TTD2060350E	3,50	6,00	72	15,40	32,55
TTD2060355E	3,55	6,00	75	15,65	33,05
TTD2060360E	3,60	6,00	75	15,85	33,50
TTD2060365E	3,65	6,00	75	16,10	33,95
TTD2060370E	3,70	6,00	75	16,30	34,45
TTD2060375E	3,75	6,00	75	16,50	34,90
TTD2060380E	3,80	6,00	77	16,75	35,35
TTD2060385E	3,85	6,00	77	16,95	35,85
TTD2060390E	3,90	6,00	77	17,20	36,30
TTD2060395E	3,95	6,00	77	17,40	36,75
TTD2060400E	4,00	6,00	80	17,60	37,20
TTD2060410E	4,10	6,00	80	18,05	38,15
TTD2060420E	4,20	6,00	80	18,50	39,10
TTD2060430E	4,30	6,00	80	18,95	40,00
TTD2060440E	4,40	6,00	80	19,40	40,95
TTD2060450E	4,50	6,00	80	19,80	41,85
TTD2060460E	4,60	6,00	85	20,25	42,80
TTD2060470E	4,70	6,00	85	20,70	43,75
TTD2060480E	4,80	6,00	85	21,15	44,65
TTD2060490E	4,90	6,00	85	21,60	45,60
TTD2060500E	5,00	6,00	85	22,00	46,50
TTD2060510E	5,10	6,00	90	22,45	47,45
TTD2060520E	5,20	6,00	90	22,90	48,40
TTD2060530E	5,30	6,00	90	23,35	49,30
TTD2060540E	5,40	6,00	90	23,80	50,25
TTD2060550E	5,50	6,00	90	24,20	51,15
TTD2060560E	5,60	6,00	95	24,65	52,10
TTD2060570E	5,70	6,00	95	25,10	53,05
TTD2060580E	5,80	6,00	95	25,55	53,95
TTD2060590E	5,90	6,00	95	26,00	54,90
TTD2060600E	6,00	6,00	95	26,40	55,80

Notes

TTD212E

Punta elicoidale con canalini di raffreddamento interni
Twist drill with internal coolant holes
Spiralbohrer mit inneren Kühlkanälen
Foret hélicoïdal avec arrosage interne

12xD | 30° | Z 2 | TUSA NORM





P M K N S H

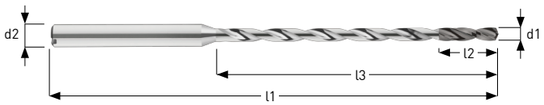
Art. Tusa Precision	d1 k5	d2 h6	l1 +/-0.2	l2 0/+0.5	l3 0/+0.5
TTD2120100E	1,00	3,00	58	4,40	15,30
TTD2120105E	1,05	3,00	58	4,65	16,10
TTD2120110E	1,10	3,00	58	4,85	16,85
TTD2120115E	1,15	3,00	58	5,10	17,60
TTD2120120E	1,20	3,00	58	5,30	18,40
TTD2120125E	1,25	3,00	58	5,50	19,15
TTD2120130E	1,30	3,00	64	5,75	19,90
TTD2120135E	1,35	3,00	64	5,95	20,70
TTD2120140E	1,40	3,00	64	6,20	21,45
TTD2120145E	1,45	3,00	64	6,40	22,20
TTD2120150E	1,50	3,00	64	6,60	22,95
TTD2120155E	1,55	3,00	68	6,85	23,75
TTD2120160E	1,60	3,00	68	7,05	24,50
TTD2120165E	1,65	3,00	68	7,30	25,25
TTD2120170E	1,70	3,00	68	7,50	26,05
TTD2120175E	1,75	3,00	68	7,70	26,80
TTD2120180E	1,80	3,00	72	7,95	27,55
TTD2120185E	1,85	3,00	72	8,15	28,35
TTD2120190E	1,90	3,00	72	8,40	29,10
TTD2120195E	1,95	3,00	72	8,60	29,85
TTD2120200E	2,00	4,00	72	8,80	30,60
TTD2120205E	2,05	4,00	76	9,05	31,40
TTD2120210E	2,10	4,00	76	9,25	32,15
TTD2120215E	2,15	4,00	76	9,50	32,90
TTD2120220E	2,20	4,00	76	9,70	33,70
TTD2120225E	2,25	4,00	76	9,90	34,45
TTD2120230E	2,30	4,00	80	10,15	35,20
TTD2120235E	2,35	4,00	80	10,35	36,00
TTD2120240E	2,40	4,00	80	10,60	36,75
TTD2120245E	2,45	4,00	80	10,80	37,50
TTD2120250E	2,50	4,00	80	11,00	38,25
TTD2120255E	2,55	4,00	84	11,25	39,05
TTD2120260E	2,60	4,00	84	11,45	39,80
TTD2120265E	2,65	4,00	84	11,70	40,55
TTD2120270E	2,70	4,00	84	11,90	41,35
TTD2120275E	2,75	4,00	84	12,10	42,10
TTD2120280E	2,80	4,00	88	12,35	42,85
TTD2120285E	2,85	4,00	88	12,55	43,65
TTD2120290E	2,90	4,00	88	12,80	44,40
TTD2120295E	2,95	4,00	88	13,00	45,15
TTD2120300E	3,00	6,00	92	13,20	45,90
TTD2120305E	3,05	6,00	92	13,45	46,70
TTD2120310E	3,10	6,00	92	13,65	47,45
TTD2120315E	3,15	6,00	92	13,90	48,20
TTD2120320E	3,20	6,00	92	14,10	49,00
TTD2120325E	3,25	6,00	92	14,30	49,75
TTD2120330E	3,30	6,00	96	14,55	50,50
TTD2120335E	3,35	6,00	96	14,75	51,30
TTD2120340E	3,40	6,00	96	15,00	52,05
TTD2120345E	3,45	6,00	96	15,20	52,80
TTD2120350E	3,50	6,00	96	15,40	53,55
TTD2120355E	3,55	6,00	100	15,65	54,35
TTD2120360E	3,60	6,00	100	15,85	55,10
TTD2120365E	3,65	6,00	100	16,10	55,85
TTD2120370E	3,70	6,00	100	16,30	56,65
TTD2120375E	3,75	6,00	100	16,50	57,40
TTD2120380E	3,80	6,00	104	16,75	58,15
TTD2120385E	3,85	6,00	104	16,95	58,95
TTD2120390E	3,90	6,00	104	17,20	59,70
TTD2120395E	3,95	6,00	104	17,40	60,45
TTD2120400E	4,00	6,00	108	17,60	61,20
TTD2120410E	4,10	6,00	108	18,05	62,75
TTD2120420E	4,20	6,00	108	18,50	64,30
TTD2120430E	4,30	6,00	108	18,95	65,80
TTD2120440E	4,40	6,00	108	19,40	67,35
TTD2120450E	4,50	6,00	108	19,80	68,85
TTD2120460E	4,60	6,00	115	20,25	70,40
TTD2120470E	4,70	6,00	115	20,70	71,95
TTD2120480E	4,80	6,00	115	21,15	73,45
TTD2120490E	4,90	6,00	115	21,60	75,00
TTD2120500E	5,00	6,00	115	22,00	76,50
TTD2120510E	5,10	6,00	122	22,45	78,05
TTD2120520E	5,20	6,00	122	22,90	79,60
TTD2120530E	5,30	6,00	122	23,35	81,10
TTD2120540E	5,40	6,00	122	23,80	82,65
TTD2120550E	5,50	6,00	122	24,20	84,15
TTD2120560E	5,60	6,00	130	24,65	85,70
TTD2120570E	5,70	6,00	130	25,10	87,25
TTD2120580E	5,80	6,00	130	25,55	88,75
TTD2120590E	5,90	6,00	130	26,00	90,30
TTD2120600E	6,00	6,00	130	26,40	91,80

Notes

TTD218E

Punta elicoidale con canalini di raffreddamento interni
Twist drill with internal coolant holes
Spiralbohrer mit inneren Kühlkanälen
Foret hélicoïdal avec arrosage interne

18xD | 130° | Z 2 | TUSA NORM





P M K N S H

Art. Tusa Precision	d1 k5	d2 h6	l1 +/-0.2	l2 0/+0.5	l3 0/+0.5
TTD2180100E	1,00	3,00	64	4,40	21,30
TTD2180105E	1,05	3,00	64	4,65	22,40
TTD2180110E	1,10	3,00	64	4,85	23,45
TTD2180115E	1,15	3,00	64	5,10	24,50
TTD2180120E	1,20	3,00	64	5,30	25,60
TTD2180125E	1,25	3,00	64	5,50	26,65
TTD2180130E	1,30	3,00	72	5,75	27,70
TTD2180135E	1,35	3,00	72	5,95	28,80
TTD2180140E	1,40	3,00	72	6,20	29,85
TTD2180145E	1,45	3,00	72	6,40	30,90
TTD2180150E	1,50	3,00	72	6,60	31,95
TTD2180155E	1,55	3,00	80	6,85	33,05
TTD2180160E	1,60	3,00	80	7,05	34,10
TTD2180165E	1,65	3,00	80	7,30	35,15
TTD2180170E	1,70	3,00	80	7,50	36,25
TTD2180175E	1,75	3,00	80	7,70	37,30
TTD2180180E	1,80	3,00	88	7,95	38,35
TTD2180185E	1,85	3,00	88	8,15	39,45
TTD2180190E	1,90	3,00	88	8,40	40,50
TTD2180195E	1,95	3,00	88	8,60	41,55
TTD2180200E	2,00	4,00	88	8,80	42,60
TTD2180205E	2,05	4,00	94	9,05	43,70
TTD2180210E	2,10	4,00	94	9,25	44,75
TTD2180215E	2,15	4,00	94	9,50	45,80
TTD2180220E	2,20	4,00	94	9,70	46,90
TTD2180225E	2,25	4,00	94	9,90	47,95
TTD2180230E	2,30	4,00	100	10,15	49,00
TTD2180235E	2,35	4,00	100	10,35	50,10
TTD2180240E	2,40	4,00	100	10,60	51,15
TTD2180245E	2,45	4,00	100	10,80	52,20
TTD2180250E	2,50	4,00	100	11,00	53,25
TTD2180255E	2,55	4,00	106	11,25	54,35
TTD2180260E	2,60	4,00	106	11,45	55,40
TTD2180265E	2,65	4,00	106	11,70	56,45
TTD2180270E	2,70	4,00	106	11,90	57,55
TTD2180275E	2,75	4,00	106	12,10	58,60
TTD2180280E	2,80	4,00	110	12,35	59,65
TTD2180285E	2,85	4,00	110	12,55	60,75
TTD2180290E	2,90	4,00	110	12,80	61,80
TTD2180295E	2,95	4,00	110	13,00	62,85

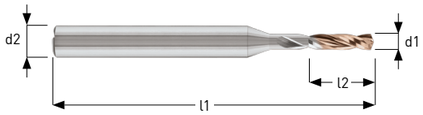
Art. Tusa Precision	d1 k5	d2 h6	l1 +/-0.2	l2 0/+0.5	l3 0/+0.5
TTD2180300E	3,00	6,00	114	13,20	63,90
TTD2180305E	3,05	6,00	114	13,45	65,00
TTD2180310E	3,10	6,00	114	13,65	66,05
TTD2180315E	3,15	6,00	114	13,90	67,10
TTD2180320E	3,20	6,00	114	14,10	68,20
TTD2180325E	3,25	6,00	114	14,30	69,25
TTD2180330E	3,30	6,00	118	14,55	70,30
TTD2180335E	3,35	6,00	118	14,75	71,40
TTD2180340E	3,40	6,00	118	15,00	72,45
TTD2180345E	3,45	6,00	118	15,20	73,50
TTD2180350E	3,50	6,00	118	15,40	74,55
TTD2180355E	3,55	6,00	122	15,65	75,65
TTD2180360E	3,60	6,00	122	15,85	76,70
TTD2180365E	3,65	6,00	122	16,10	77,75
TTD2180370E	3,70	6,00	122	16,30	78,85
TTD2180375E	3,75	6,00	122	16,50	79,90
TTD2180380E	3,80	6,00	126	16,75	80,95
TTD2180385E	3,85	6,00	126	16,95	82,05
TTD2180390E	3,90	6,00	126	17,20	83,10
TTD2180395E	3,95	6,00	126	17,40	84,15
TTD2180400E	4,00	6,00	130	17,60	85,20
TTD2180410E	4,10	6,00	130	18,05	87,35
TTD2180420E	4,20	6,00	130	18,50	89,50
TTD2180430E	4,30	6,00	130	18,95	91,60
TTD2180440E	4,40	6,00	130	19,40	93,75
TTD2180450E	4,50	6,00	130	19,80	95,85
TTD2180460E	4,60	6,00	142	20,25	98,00
TTD2180470E	4,70	6,00	142	20,70	100,15
TTD2180480E	4,80	6,00	142	21,15	102,25
TTD2180490E	4,90	6,00	142	21,60	104,40
TTD2180500E	5,00	6,00	142	22,00	106,50
TTD2180510E	5,10	6,00	153	22,45	108,65
TTD2180520E	5,20	6,00	153	22,90	110,80
TTD2180530E	5,30	6,00	153	23,35	112,90
TTD2180540E	5,40	6,00	153	23,80	115,05
TTD2180550E	5,50	6,00	153	24,20	117,15
TTD2180560E	5,60	6,00	165	24,65	119,30
TTD2180570E	5,70	6,00	165	25,10	121,45
TTD2180580E	5,80	6,00	165	25,55	123,55
TTD2180590E	5,90	6,00	165	26,00	125,70
TTD2180600E	6,00	6,00	165	26,40	127,80

Notes

TTD203S

Punta elicoidale con canalini di raffreddamento interni
Twist drill with internal coolant holes
Spiralbohrer mit inneren Kühlkanälen
Foret hélicoïdal avec arrosage interne

3xD | 140° | Z 2 | TUSA NORM





P M S

Art. Tusa Precision	d1 k5	d2 h6	l1 +/-0.3	l2 0/+0.3
TTD2030100S	1,00	3,00	40	7,00
TTD2030105S	1,05	3,00	40	7,30
TTD2030110S	1,10	3,00	40	7,60
TTD2030115S	1,15	3,00	40	7,90
TTD2030120S	1,20	3,00	40	8,20
TTD2030125S	1,25	3,00	40	8,50
TTD2030130S	1,30	3,00	42	8,80
TTD2030135S	1,35	3,00	42	9,10
TTD2030140S	1,40	3,00	42	9,40
TTD2030145S	1,45	3,00	42	9,70
TTD2030150S	1,50	3,00	42	10,00
TTD2030155S	1,55	3,00	45	10,30
TTD2030160S	1,60	3,00	45	10,60
TTD2030165S	1,65	3,00	45	10,90
TTD2030170S	1,70	3,00	45	11,20
TTD2030175S	1,75	3,00	45	11,50
TTD2030180S	1,80	3,00	47	11,80
TTD2030185S	1,85	3,00	47	12,10
TTD2030190S	1,90	3,00	47	12,40
TTD2030195S	1,95	3,00	47	12,70
TTD2030200S	2,00	4,00	47	13,00
TTD2030205S	2,05	4,00	50	13,30
TTD2030210S	2,10	4,00	50	13,60
TTD2030215S	2,15	4,00	50	13,90
TTD2030220S	2,20	4,00	50	14,20
TTD2030225S	2,25	4,00	5	14,50
TTD2030230S	2,30	4,00	52	14,80
TTD2030235S	2,35	4,00	52	15,10
TTD2030240S	2,40	4,00	52	15,40
TTD2030245S	2,45	4,00	52	15,70
TTD2030250S	2,50	4,00	52	16,00
TTD2030255S	2,55	4,00	55	16,30
TTD2030260S	2,60	4,00	55	16,60
TTD2030265S	2,65	4,00	55	16,90
TTD2030270S	2,70	4,00	55	17,20
TTD2030275S	2,75	4,00	55	17,50
TTD2030280S	2,80	4,00	57	17,80
TTD2030285S	2,85	4,00	57	18,10
TTD2030290S	2,90	4,00	57	18,40
TTD2030295S	2,95	4,00	57	18,70

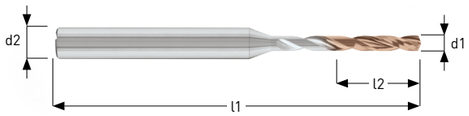
Art. Tusa Precision	d1 k5	d2 h6	l1 +/-0.3	l2 0/+0.3
TTD2030300S	3,00	6,00	60	19,00
TTD2030305S	3,05	6,00	60	19,30
TTD2030310S	3,10	6,00	60	19,60
TTD2030315S	3,15	6,00	60	19,90
TTD2030320S	3,20	6,00	60	20,20
TTD2030325S	3,25	6,00	60	20,50
TTD2030330S	3,30	6,00	62	20,80
TTD2030335S	3,35	6,00	62	21,10
TTD2030340S	3,40	6,00	62	21,40
TTD2030345S	3,45	6,00	62	21,70
TTD2030350S	3,50	6,00	62	22,00
TTD2030355S	3,55	6,00	65	22,30
TTD2030360S	3,60	6,00	65	22,60
TTD2030365S	3,65	6,00	65	22,90
TTD2030370S	3,70	6,00	65	23,20
TTD2030375S	3,75	6,00	65	23,50
TTD2030380S	3,80	6,00	67	23,80
TTD2030385S	3,85	6,00	67	24,10
TTD2030390S	3,90	6,00	67	24,40
TTD2030395S	3,95	6,00	67	24,70
TTD2030400S	4,00	6,00	70	25,00

Notes

TTD206S

Punta elicoidale con canalini di raffreddamento interni
Twist drill with internal coolant holes
Spiralbohrer mit inneren Kühlkanälen
Foret hélicoïdal avec arrosage interne

6xD | 140° | Z 2 | TUSA NORM



P M S



Art. Tusa Precision	d1 k5	d2 h6	l1 +/-0.3	l2 0/+0.3
TTD2060100S	1,00	3,00	50	10,00
TTD2060105S	1,05	3,00	50	10,45
TTD2060110S	1,10	3,00	50	10,90
TTD2060115S	1,15	3,00	50	11,35
TTD2060120S	1,20	3,00	50	11,80
TTD2060125S	1,25	3,00	50	12,25
TTD2060130S	1,30	3,00	52	12,70
TTD2060135S	1,35	3,00	52	13,15
TTD2060140S	1,40	3,00	52	13,60
TTD2060145S	1,45	3,00	52	14,05
TTD2060150S	1,50	3,00	52	14,50
TTD2060155S	1,55	3,00	55	14,95
TTD2060160S	1,60	3,00	55	15,40
TTD2060165S	1,65	3,00	55	15,85
TTD2060170S	1,70	3,00	55	16,30
TTD2060175S	1,75	3,00	55	16,75
TTD2060180S	1,80	3,00	57	17,20
TTD2060185S	1,85	3,00	57	17,65
TTD2060190S	1,90	3,00	57	18,10
TTD2060195S	1,95	3,00	57	18,55
TTD2060200S	2,00	4,00	57	19,00
TTD2060205S	2,05	4,00	60	19,45
TTD2060210S	2,10	4,00	60	19,90
TTD2060215S	2,15	4,00	60	20,35
TTD2060220S	2,20	4,00	60	20,80
TTD2060225S	2,25	4,00	60	21,25
TTD2060230S	2,30	4,00	62	21,70
TTD2060235S	2,35	4,00	62	22,15
TTD2060240S	2,40	4,00	62	22,60
TTD2060245S	2,45	4,00	62	23,05
TTD2060250S	2,50	4,00	62	23,50
TTD2060255S	2,55	4,00	65	23,95
TTD2060260S	2,60	4,00	65	24,40
TTD2060265S	2,65	4,00	65	24,85
TTD2060270S	2,70	4,00	65	25,30
TTD2060275S	2,75	4,00	65	25,75
TTD2060280S	2,80	4,00	67	26,20
TTD2060285S	2,85	4,00	67	26,65
TTD2060290S	2,90	4,00	67	27,10
TTD2060295S	2,95	4,00	67	27,55
TTD2060300S	3,00	6,00	70	28,00
TTD2060305S	3,05	6,00	70	28,45
TTD2060310S	3,10	6,00	70	28,90
TTD2060315S	3,15	6,00	70	29,35
TTD2060320S	3,20	6,00	70	29,80
TTD2060325S	3,25	6,00	70	30,25
TTD2060330S	3,30	6,00	72	30,70
TTD2060335S	3,35	6,00	72	31,15
TTD2060340S	3,40	6,00	72	31,60
TTD2060345S	3,45	6,00	72	32,05
TTD2060350S	3,50	6,00	72	32,50
TTD2060355S	3,55	6,00	75	32,95
TTD2060360S	3,60	6,00	75	33,40
TTD2060365S	3,65	6,00	75	33,85
TTD2060370S	3,70	6,00	75	34,30
TTD2060375S	3,75	6,00	75	34,75
TTD2060380S	3,80	6,00	77	35,20
TTD2060385S	3,85	6,00	77	35,65
TTD2060390S	3,90	6,00	77	36,10
TTD2060395S	3,95	6,00	77	36,55
TTD2060400S	4,00	6,00	80	37,00

Notes

TTD203

Parametri indicativi per la foratura

Standard values for drilling | Richtwerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocità di taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 1.00-1.95	Ø 2.00-4.00
P00	●	70-110	0.025-0.055	0.05-0.13
P01	●	70-110	0.025-0.055	0.05-0.13
P02	●	70-110	0.025-0.055	0.05-0.13
P03	●	60-100	0.02-0.05	0.045-0.12
P04	●	60-100	0.02-0.05	0.045-0.12
P05	●	60-100	0.02-0.05	0.045-0.12
P06	●	60-100	0.02-0.05	0.045-0.12
M01	●	50-90	0.015-0.045	0.04-0.1
M02	●	50-90	0.015-0.045	0.04-0.1
M03	●	50-90	0.015-0.045	0.04-0.1
K01	●	90-140	0.05-0.11	0.1-0.27
K03	●	80-120	0.04-0.1	0.09-0.25
K02	●	80-120	0.04-0.1	0.09-0.25
N01	◑	120-170	0.05-0.11	0.1-0.25
N02	◑	150-200	0.05-0.11	0.1-0.25
N03	◑	200-250	0.05-0.11	0.1-0.25
N04	◑	60-200	0.02-0.11	0.045-0.25
S01	◑	20-50	0.02-0.05	0.045-0.12
S02	◑	20-50	0.02-0.05	0.045-0.12
S03	◑	20-50	0.02-0.05	0.045-0.12
S04	◑	30-60	0.015-0.035	0.03-0.085
H01	◑	30-60	0.02-0.03	0.03-0.1
H02	◑	30-60	0.02-0.03	0.03-0.1
H03	○	-	-	-
O01	◑	70-110	0.025-0.055	0.05-0.13
O02	○	-	-	-
O03	○	-	-	-
O04	○	-	-	-
O05	○	-	-	-

TTD207

Parametri indicativi per la foratura

Standard values for drilling | Richtwerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocità di taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 1.00-1.95	Ø 2.00-4.00
P00	●	70-110	0.025-0.055	0.05-0.13
P01	●	70-110	0.025-0.055	0.05-0.13
P02	●	70-110	0.025-0.055	0.05-0.13
P03	●	60-100	0.02-0.05	0.045-0.12
P04	●	60-100	0.02-0.05	0.045-0.12
P05	●	60-100	0.02-0.05	0.045-0.12
P06	●	60-100	0.02-0.05	0.045-0.12
M01	●	50-90	0.015-0.045	0.04-0.1
M02	●	50-90	0.015-0.045	0.04-0.1
M03	●	50-90	0.015-0.045	0.04-0.1
K01	●	90-140	0.05-0.11	0.1-0.27
K03	●	80-120	0.04-0.1	0.09-0.25
K02	●	80-120	0.04-0.1	0.09-0.25
N01	◑	120-170	0.05-0.11	0.1-0.25
N02	◑	150-200	0.05-0.11	0.1-0.25
N03	◑	200-250	0.05-0.11	0.1-0.25
N04	◑	60-200	0.02-0.11	0.045-0.25
S01	◑	20-50	0.02-0.05	0.045-0.12
S02	◑	20-50	0.02-0.05	0.045-0.12
S03	◑	20-50	0.02-0.05	0.045-0.12
S04	◑	30-60	0.015-0.035	0.03-0.085
H01	◑	30-60	0.02-0.03	0.03-0.1
H02	◑	30-60	0.02-0.03	0.03-0.1
H03	○	-	-	-
O01	◑	70-110	0.025-0.055	0.05-0.13
O02	○	-	-	-
O03	○	-	-	-
O04	○	-	-	-
O05	○	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

TTD204

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocità di taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 1.00-1.95	Ø 2.00-4.00
P00	●	70-110	0.025-0.055	0.05-0.13
P01	●	70-110	0.025-0.055	0.05-0.13
P02	●	70-110	0.025-0.055	0.05-0.13
P03	●	60-100	0.02-0.05	0.045-0.12
P04	●	60-100	0.02-0.05	0.045-0.12
P05	●	60-100	0.02-0.05	0.045-0.12
P06	●	60-100	0.02-0.05	0.045-0.12
M01	●	50-90	0.015-0.045	0.04-0.1
M02	●	50-90	0.015-0.045	0.04-0.1
M03	●	50-90	0.015-0.045	0.04-0.1
K01	●	90-140	0.05-0.11	0.1-0.27
K03	●	80-120	0.04-0.1	0.09-0.25
K02	●	80-120	0.04-0.1	0.09-0.25
N01	◑	120-170	0.05-0.11	0.1-0.25
N02	◑	150-200	0.05-0.11	0.1-0.25
N03	◑	200-250	0.05-0.11	0.1-0.25
N04	◑	60-200	0.02-0.11	0.045-0.25
S01	◑	20-50	0.02-0.05	0.045-0.12
S02	◑	20-50	0.02-0.05	0.045-0.12
S03	◑	20-50	0.02-0.05	0.045-0.12
S04	◑	30-60	0.015-0.035	0.03-0.085
H01	◑	30-60	0.02-0.03	0.03-0.1
H02	◑	30-60	0.02-0.03	0.03-0.1
H03	○	-	-	-
O01	◑	70-110	0.025-0.055	0.05-0.13
O02	○	-	-	-
O03	○	-	-	-
O04	○	-	-	-
O05	○	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

TTD209

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocità di taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 1.00-1.95	Ø 2.00-4.00
P00	●	70-110	0.025-0.055	0.05-0.13
P01	●	70-110	0.025-0.055	0.05-0.13
P02	●	70-110	0.025-0.055	0.05-0.13
P03	●	60-100	0.02-0.05	0.045-0.12
P04	●	60-100	0.02-0.05	0.045-0.12
P05	●	60-100	0.02-0.05	0.045-0.12
P06	●	60-100	0.02-0.05	0.045-0.12
M01	●	50-90	0.015-0.045	0.04-0.1
M02	●	50-90	0.015-0.045	0.04-0.1
M03	●	50-90	0.015-0.045	0.04-0.1
K01	●	90-140	0.05-0.11	0.1-0.27
K03	●	80-120	0.04-0.1	0.09-0.25
K02	●	80-120	0.04-0.1	0.09-0.25
N01	◑	120-170	0.05-0.11	0.1-0.25
N02	◑	150-200	0.05-0.11	0.1-0.25
N03	◑	200-250	0.05-0.11	0.1-0.25
N04	◑	60-200	0.02-0.11	0.045-0.25
S01	◑	20-50	0.02-0.05	0.045-0.12
S02	◑	20-50	0.02-0.05	0.045-0.12
S03	◑	20-50	0.02-0.05	0.045-0.12
S04	◑	30-60	0.015-0.035	0.03-0.085
H01	◑	30-60	0.02-0.03	0.03-0.1
H02	◑	30-60	0.02-0.03	0.03-0.1
H03	○	-	-	-
O01	◑	70-110	0.025-0.055	0.05-0.13
O02	○	-	-	-
O03	○	-	-	-
O04	○	-	-	-
O05	○	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

TTD215

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocità di taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 1.00-2.40	Ø 2.45-4.00
P00	●	70-110	0.03-0.08	0.060-0.130
P01	●	70-110	0.03-0.08	0.060-0.130
P02	●	70-110	0.03-0.08	0.060-0.130
P03	●	60-100	0.020-0.060	0.050-0.120
P04	●	50-90	0.015-0.050	0.040-0.100
P05	●	50-90	0.015-0.050	0.040-0.100
P06	●	50-90	0.015-0.050	0.040-0.100
M01	●	40-80	0.010-0.045	0.030-0.090
M02	●	40-80	0.010-0.045	0.030-0.090
M03	●	40-80	0.010-0.045	0.030-0.090
K01	●	90-140	0.030-0.080	0.080-0.150
K03	●	80-120	0.040-0.100	0.060-0.130
K02	●	80-120	0.040-0.100	0.060-0.130
N01	◑	150-200	0.050-0.110	0.100-0.250
N02	◑	150-200	0.050-0.110	0.100-0.250
N03	◑	200-250	0.050-0.110	0.100-0.250
N04	◑	80-170	0.040-0.100	0.100-0.250
S01	◑	30-55	0.010-0.040	0.040-0.100
S02	◑	30-55	0.010-0.040	0.040-0.100
S03	◑	30-55	0.010-0.040	0.040-0.100
S04	◑	50-90	0.020-0.060	0.030-0.070
H01	◑	30-60	0.015-0.050	0.040-0.100
H02	◑	30-60	0.015-0.050	0.040-0.100
H03	○	-	-	-
001	◑	70-110	0.025-0.050	0.050-0.130
002	○	-	-	-
003	○	-	-	-
004	○	-	-	-
005	○	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

TTD206E

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocità di taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 1.00-1.95	Ø 2.00-5.00	Ø 5.10-6.00
P00	●	70-110	0.025-0.055	0.05-0.13	0.125-0.17
P01	●	70-110	0.025-0.055	0.05-0.13	0.125-0.17
P02	●	70-110	0.025-0.055	0.05-0.13	0.125-0.17
P03	●	60-100	0.02-0.05	0.045-0.12	0.115-0.15
P04	●	60-100	0.02-0.05	0.045-0.12	0.115-0.15
P05	●	60-100	0.02-0.05	0.045-0.12	0.115-0.15
P06	●	60-100	0.02-0.05	0.045-0.12	0.115-0.15
M01	●	50-90	0.015-0.045	0.04-0.1	0.09-0.13
M02	●	50-90	0.015-0.045	0.04-0.1	0.09-0.13
M03	●	50-90	0.015-0.045	0.04-0.1	0.09-0.13
K01	●	90-140	0.05-0.11	0.1-0.27	0.26-0.34
K03	●	80-120	0.04-0.1	0.09-0.25	0.26-0.34
K02	●	80-120	0.04-0.1	0.09-0.25	0.24-0.3
N01	◑	120-170	0.05-0.11	0.1-0.25	0.24-0.34
N02	◑	150-200	0.05-0.11	0.1-0.25	0.24-0.34
N03	◑	200-250	0.05-0.11	0.1-0.25	0.24-0.34
N04	◑	60-200	0.02-0.11	0.045-0.25	0.115-0.34
S01	◑	20-50	0.02-0.05	0.045-0.12	0.115-0.15
S02	◑	20-50	0.02-0.05	0.045-0.12	0.115-0.15
S03	◑	20-50	0.02-0.05	0.045-0.12	0.115-0.15
S04	◑	30-60	0.015-0.035	0.03-0.085	0.08-0.11
H01	◑	30-60	0.02-0.03	0.03-0.1	0.09-0.14
H02	◑	30-60	0.02-0.03	0.03-0.1	0.09-0.14
H03	○	-	-	-	-
001	◑	70-110	0.025-0.055	0.05-0.13	0.125-0.17
002	○	-	-	-	-
003	○	-	-	-	-
004	○	-	-	-	-
005	○	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

TTD212E

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocità di taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 1.00-2.40	Ø 2.45-5.00	Ø 5.10-6.00
P00	●	70-110	0.03-0.080	0.060-0.130	0.125-0.17
P01	●	70-110	0.03-0.080	0.060-0.130	0.125-0.17
P02	●	70-110	0.03-0.080	0.060-0.130	0.125-0.17
P03	●	60-100	0.020-0.060	0.050-0.120	0.115-0.15
P04	●	50-90	0.015-0.050	0.040-0.100	0.08-0.13
P05	●	50-90	0.015-0.050	0.040-0.100	0.08-0.13
P06	●	50-90	0.015-0.050	0.040-0.100	0.08-0.13
M01	●	40-80	0.010-0.045	0.030-0.090	0.07-0.12
M02	●	40-80	0.010-0.045	0.030-0.090	0.07-0.12
M03	●	40-80	0.010-0.045	0.030-0.090	0.07-0.12
K01	●	90-140	0.030-0.080	0.080-0.150	0.15-0.28
K03	●	80-120	0.040-0.100	0.060-0.130	0.13-0.22
K02	●	80-120	0.040-0.100	0.060-0.130	0.13-0.22
N01	◑	150-200	0.050-0.110	0.100-0.250	0.24-0.34
N02	◑	150-200	0.050-0.110	0.100-0.250	0.24-0.34
N03	◑	200-250	0.050-0.110	0.100-0.250	0.24-0.34
N04	◑	80-170	0.040-0.100	0.100-0.250	0.24-0.3
S01	◑	30-55	0.010-0.040	0.040-0.100	0.08-0.13
S02	◑	30-55	0.010-0.040	0.040-0.100	0.08-0.13
S03	◑	30-55	0.010-0.040	0.040-0.100	0.08-0.13
S04	◑	50-90	0.020-0.060	0.030-0.070	0.1-0.2
H01	◑	30-60	0.015-0.050	0.040-0.100	0.09-0.14
H02	◑	30-60	0.015-0.050	0.040-0.100	0.09-0.14
H03	○	-	-	-	-
001	◑	70-110	0.025-0.050	0.050-0.130	0.13-0.17
002	○	-	-	-	-
003	○	-	-	-	-
004	○	-	-	-	-
005	○	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

Made in Switzerland

TTD218E

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocità di taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 1.00-2.40	Ø 2.45-5.00	Ø 5.10-6.00
P00	●	70-110	0.0255-0.068	0.051-0.1105	0.102-0.1445
P01	●	70-110	0.0255-0.068	0.051-0.1105	0.102-0.1445
P02	●	70-110	0.0255-0.068	0.051-0.1105	0.102-0.1445
P03	●	60-100	0.017-0.051	0.0425-0.102	0.0935-0.1275
P04	●	50-90	0.0085-0.0425	0.034-0.085	0.068-0.1105
P05	●	50-90	0.0085-0.0425	0.034-0.085	0.068-0.1105
P06	●	50-90	0.0085-0.0425	0.034-0.085	0.068-0.1105
M01	●	40-80	0.0085-0.03825	0.0255-0.0765	0.0595-0.102
M02	●	40-80	0.0085-0.03825	0.0255-0.0765	0.0595-0.102
M03	●	40-80	0.0085-0.03825	0.0255-0.0765	0.0595-0.102
K01	●	90-140	0.0255-0.068	0.068-0.1275	0.1275-0.238
K03	●	80-120	0.034-0.085	0.051-0.1105	0.1105-0.187
K02	●	80-120	0.034-0.085	0.051-0.1105	0.1105-0.187
N01	◑	150-200	0.0425-0.0935	0.085-0.2125	0.204-0.289
N02	◑	150-200	0.0425-0.0935	0.085-0.2125	0.204-0.289
N03	◑	200-250	0.0425-0.0935	0.085-0.2125	0.204-0.289
N04	◑	80-170	0.034-0.085	0.085-0.2125	0.204-0.255
S01	◑	30-55	0.0085-0.034	0.034-0.085	0.068-0.1105
S02	◑	30-55	0.0085-0.034	0.034-0.085	0.068-0.1105
S03	◑	30-55	0.0085-0.034	0.034-0.085	0.068-0.1105
S04	◑	50-90	0.017-0.051	0.0255-0.0595	0.085-0.17
H01	◑	30-60	0.0085-0.0425	0.034-0.085	0.0765-0.119
H02	◑	30-60	0.0085-0.0425	0.034-0.085	0.0765-0.119
H03	○	-	-	-	-
001	◑	70-110	0.017-0.0425	0.0425-0.1105	0.1105-0.1445
002	○	-	-	-	-
003	○	-	-	-	-
004	○	-	-	-	-
005	○	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

TTD203S

Parametri indicativi per la foratura

Standard values for drilling | Richtwerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocità di taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 1.00-1.50	Ø 1.55-2.00	Ø 2.05-2.50	Ø 2.55-3.00	Ø 3.05-3.50	Ø 3.55-4.00
P00	○	-	-	-	-	-	-	-
P01	○	-	-	-	-	-	-	-
P02	○	-	-	-	-	-	-	-
P03	○	-	-	-	-	-	-	-
P04	○	-	-	-	-	-	-	-
P05	●	70-90	0.04-0.06	0.062-0.08	0.082-0.1	0.102-0.12	0.122-0.14	0.142-0.16
P06	●	70-90	0.03-0.045	0.047-0.06	0.062-0.075	0.077-0.09	0.091-0.105	0.106-0.12
M01	●	70-90	0.03-0.05	0.055-0.07	0.071-0.087	0.089-0.105	0.106-0.122	0.124-0.14
M02	●	70-90	0.027-0.04	0.041-0.053	0.054-0.066	0.067-0.079	0.08-0.092	0.093-0.105
M03	●	70-90	0.027-0.04	0.041-0.053	0.054-0.066	0.067-0.079	0.08-0.092	0.093-0.105
K01	○	-	-	-	-	-	-	-
K03	○	-	-	-	-	-	-	-
K02	○	-	-	-	-	-	-	-
N01	○	-	-	-	-	-	-	-
N02	○	-	-	-	-	-	-	-
N03	○	-	-	-	-	-	-	-
N04	○	-	-	-	-	-	-	-
S01	●	35-45	0.015-0.022	0.023-0.03	0.031-0.037	0.038-0.045	0.045-0.052	0.053-0.06
S02	●	65-75	0.03-0.045	0.047-0.06	0.062-0.075	0.077-0.09	0.091-0.105	0.106-0.12
S03	●	35-45	0.015-0.022	0.023-0.03	0.031-0.037	0.038-0.045	0.045-0.052	0.053-0.06
S04	●	45-55	0.02-0.03	0.03-0.035	0.035-0.045	0.045-0.05	0.05-0.055	0.055-0.06
H01	○	-	-	-	-	-	-	-
H02	○	-	-	-	-	-	-	-
H03	○	-	-	-	-	-	-	-
O01	○	-	-	-	-	-	-	-
O02	○	-	-	-	-	-	-	-
O03	○	-	-	-	-	-	-	-
O04	○	-	-	-	-	-	-	-
O05	○	-	-	-	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

Made in Switzerland

TTD206S

Parametri indicativi per la foratura

Standard values for drilling | Richtwerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocità di taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 1.00-1.50	Ø 1.55-2.00	Ø 2.05-2.50	Ø 2.55-3.00	Ø 3.05-3.50	Ø 3.55-4.00
P00	○	-	-	-	-	-	-	-
P01	○	-	-	-	-	-	-	-
P02	○	-	-	-	-	-	-	-
P03	○	-	-	-	-	-	-	-
P04	○	-	-	-	-	-	-	-
P05	●	70-90	0.04-0.06	0.062-0.08	0.082-0.1	0.102-0.12	0.122-0.14	0.142-0.16
P06	●	70-90	0.03-0.045	0.047-0.06	0.062-0.075	0.077-0.09	0.091-0.105	0.106-0.12
M01	●	70-90	0.03-0.05	0.055-0.07	0.071-0.087	0.089-0.105	0.106-0.122	0.124-0.14
M02	●	70-90	0.027-0.04	0.041-0.053	0.054-0.066	0.067-0.079	0.08-0.092	0.093-0.105
M03	●	70-90	0.027-0.04	0.041-0.053	0.054-0.066	0.067-0.079	0.08-0.092	0.093-0.105
K01	○	-	-	-	-	-	-	-
K03	○	-	-	-	-	-	-	-
K02	○	-	-	-	-	-	-	-
N01	○	-	-	-	-	-	-	-
N02	○	-	-	-	-	-	-	-
N03	○	-	-	-	-	-	-	-
N04	○	-	-	-	-	-	-	-
S01	●	35-45	0.015-0.022	0.023-0.03	0.031-0.037	0.038-0.045	0.045-0.052	0.053-0.06
S02	●	65-75	0.03-0.045	0.047-0.06	0.062-0.075	0.077-0.09	0.091-0.105	0.106-0.12
S03	●	35-45	0.015-0.022	0.023-0.03	0.031-0.037	0.038-0.045	0.045-0.052	0.053-0.06
S04	●	45-55	0.02-0.03	0.03-0.035	0.035-0.045	0.045-0.05	0.05-0.055	0.055-0.06
H01	○	-	-	-	-	-	-	-
H02	○	-	-	-	-	-	-	-
H03	○	-	-	-	-	-	-	-
O01	○	-	-	-	-	-	-	-
O02	○	-	-	-	-	-	-	-
O03	○	-	-	-	-	-	-	-
O04	○	-	-	-	-	-	-	-
O05	○	-	-	-	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

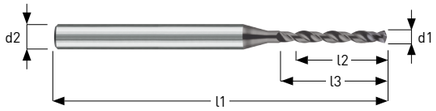
TA803

Punta centesimale senza canalini
Hundredth drill without coolant holes
Hundertstel-Bohrer ohne innere Kühlkanälen
Foret centésimales sans arrosage interne









P M K N S O



Art. Tusa Precision	d1 h6	d2 h6	l1 +/-0.2	l2 0/+0.5	l3 0/+0.5
TA80300030	0,30	3,00	38	1,50	1,95
TA80300031	0,31	3,00	38	1,50	1,95
TA80300032	0,32	3,00	38	1,50	1,95
TA80300033	0,33	3,00	38	1,50	1,95
TA80300034	0,34	3,00	38	1,50	1,95
TA80300035	0,35	3,00	38	1,50	1,95
TA80300036	0,36	3,00	38	1,50	1,95
TA80300037	0,37	3,00	38	1,50	1,95
TA80300038	0,38	3,00	38	1,50	1,95
TA80300039	0,39	3,00	38	1,50	1,95
TA80300040	0,40	3,00	38	2,00	2,50
TA80300041	0,41	3,00	38	2,00	2,50
TA80300042	0,42	3,00	38	2,00	2,50
TA80300043	0,43	3,00	38	2,00	2,50
TA80300044	0,44	3,00	38	2,00	2,50
TA80300045	0,45	3,00	38	3,50	4,15
TA80300046	0,46	3,00	38	3,50	4,15
TA80300047	0,47	3,00	38	3,50	4,15
TA80300048	0,48	3,00	38	3,50	4,15
TA80300049	0,49	3,00	38	4,00	4,70
TA80300050	0,50	3,00	38	4,00	4,70
TA80300051	0,51	3,00	38	4,00	4,70
TA80300052	0,52	3,00	38	4,00	4,70
TA80300053	0,53	3,00	38	4,00	4,70
TA80300054	0,54	3,00	38	4,50	5,25
TA80300055	0,55	3,00	38	4,50	5,25
TA80300056	0,56	3,00	38	4,50	5,25
TA80300057	0,57	3,00	38	4,50	5,25
TA80300058	0,58	3,00	38	4,50	5,25
TA80300059	0,59	3,00	38	4,50	5,25
TA80300060	0,60	3,00	38	4,50	5,25
TA80300061	0,61	3,00	38	5,00	5,80
TA80300062	0,62	3,00	38	5,00	5,80
TA80300063	0,63	3,00	38	5,00	5,80
TA80300064	0,64	3,00	38	5,00	5,80
TA80300065	0,65	3,00	38	5,00	5,80
TA80300066	0,66	3,00	38	5,00	5,80
TA80300067	0,67	3,00	38	5,00	5,80
TA80300068	0,68	3,00	38	5,50	6,35
TA80300069	0,69	3,00	38	5,60	6,45
TA80300070	0,70	3,00	38	5,60	6,45
TA80300071	0,71	3,00	38	5,60	6,45
TA80300072	0,72	3,00	38	5,60	6,45
TA80300073	0,73	3,00	38	5,60	6,45
TA80300074	0,74	3,00	38	5,60	6,45
TA80300075	0,75	3,00	38	5,60	6,45
TA80300076	0,76	3,00	38	6,50	7,45
TA80300077	0,77	3,00	38	6,50	7,45
TA80300078	0,78	3,00	38	6,50	7,45
TA80300079	0,79	3,00	38	6,50	7,45
TA80300080	0,80	3,00	38	6,50	7,45
TA80300081	0,81	3,00	38	6,50	7,45
TA80300082	0,82	3,00	38	6,50	7,45
TA80300083	0,83	3,00	38	6,50	7,45
TA80300084	0,84	3,00	38	6,50	7,45
TA80300085	0,85	3,00	38	6,50	7,45
TA80300086	0,86	3,00	38	7,00	8,00
TA80300087	0,87	3,00	38	7,00	8,00
TA80300088	0,88	3,00	38	7,00	8,00
TA80300089	0,89	3,00	38	7,00	8,00
TA80300090	0,90	3,00	38	7,00	8,00
TA80300091	0,91	3,00	38	7,00	8,00
TA80300092	0,92	3,00	38	7,00	8,00
TA80300093	0,93	3,00	38	7,00	8,00
TA80300094	0,94	3,00	38	7,00	8,00
TA80300095	0,95	3,00	38	7,00	8,00
TA80300096	0,96	3,00	38	8,00	9,10
TA80300097	0,97	3,00	38	8,00	9,10
TA80300098	0,98	3,00	38	8,00	9,10
TA80300099	0,99	3,00	38	8,00	9,10
TA80300100	1,00	3,00	38	9,00	10,20
TA80300101	1,01	3,00	38	9,00	10,20
TA80300102	1,02	3,00	38	9,00	10,20
TA80300103	1,03	3,00	38	9,00	10,20
TA80300104	1,04	3,00	38	9,00	10,20
TA80300105	1,05	3,00	38	9,00	10,20
TA80300106	1,06	3,00	38	9,00	10,20
TA80300107	1,07	3,00	38	9,00	10,20
TA80300108	1,08	3,00	38	9,00	10,20
TA80300109	1,09	3,00	38	9,00	10,20
TA80300110	1,10	3,00	38	9,00	10,20
TA80300111	1,11	3,00	38	9,00	10,20
TA80300112	1,12	3,00	38	9,00	10,20
TA80300113	1,13	3,00	38	9,00	10,20
TA80300114	1,14	3,00	38	9,00	10,20
TA80300115	1,15	3,00	38	9,00	10,20
TA80300116	1,16	3,00	38	9,00	10,20
TA80300117	1,17	3,00	38	9,00	10,20
TA80300118	1,18	3,00	38	9,00	10,20
TA80300119	1,19	3,00	38	10,00	11,30
TA80300120	1,20	3,00	38	10,00	11,30
TA80300121	1,21	3,00	38	10,00	11,30
TA80300122	1,22	3,00	38	10,00	11,30
TA80300123	1,23	3,00	38	10,00	11,30
TA80300124	1,24	3,00	38	10,00	11,30
TA80300125	1,25	3,00	38	10,00	11,30

Art. Tusa Precision	d1 h6	d2 h6	l1 +/-0.2	l2 0/+0.5	l3 0/+0.5
TA80300126	1,26	3,00	38	10,00	11,30
TA80300127	1,27	3,00	38	10,00	11,30
TA80300128	1,28	3,00	38	10,00	11,30
TA80300129	1,29	3,00	38	10,00	11,30
TA80300130	1,30	3,00	38	10,00	11,30
TA80300131	1,31	3,00	38	10,00	11,30
TA80300132	1,32	3,00	38	10,00	11,30
TA80300133	1,33	3,00	38	11,00	12,95
TA80300134	1,34	3,00	38	11,00	12,95
TA80300135	1,35	3,00	38	11,00	12,95
TA80300136	1,36	3,00	38	11,00	12,95
TA80300137	1,37	3,00	38	11,00	12,95
TA80300138	1,38	3,00	38	11,00	12,95
TA80300139	1,39	3,00	38	11,00	12,95
TA80300140	1,40	3,00	38	11,00	12,95
TA80300141	1,41	3,00	38	11,00	12,95
TA80300142	1,42	3,00	38	11,00	12,95
TA80300143	1,43	3,00	38	11,00	12,95
TA80300144	1,44	3,00	38	11,00	12,95
TA80300145	1,45	3,00	38	11,00	12,95
TA80300146	1,46	3,00	38	11,00	12,95
TA80300147	1,47	3,00	38	11,00	12,95
TA80300148	1,48	3,00	38	11,00	12,95
TA80300149	1,49	3,00	38	11,00	12,95
TA80300150	1,50	3,00	38	11,00	12,95
TA80300151	1,51	3,00	38	12,00	13,50
TA80300152	1,52	3,00	38	12,00	13,50
TA80300153	1,53	3,00	38	12,00	13,50
TA80300154	1,54	3,00	38	12,00	13,50
TA80300155	1,55	3,00	38	12,00	13,50
TA80300156	1,56	3,00	38	12,00	13,50
TA80300157	1,57	3,00	38	12,00	13,50
TA80300158	1,58	3,00	38	12,00	13,50
TA80300159	1,59	3,00	38	12,00	13,50
TA80300160	1,60	3,00	38	12,00	13,50
TA80300161	1,61	3,00	38	12,00	13,50
TA80300162	1,62	3,00	38	12,00	13,50
TA80300163	1,63	3,00	38	12,00	13,50
TA80300164	1,64	3,00	38	12,00	13,50
TA80300165	1,65	3,00	38	12,00	13,50
TA80300166	1,66	3,00	38	12,00	13,50
TA80300167	1,67	3,00	38	12,00	13,50
TA80300168	1,68	3,00	38	12,00	13,50
TA80300169	1,69	3,00	38	12,00	13,50
TA80300170	1,70	3,00	38	12,00	13,50
TA80300171	1,71	3,00	38	12,00	13,50
TA80300172	1,72	3,00	38	12,00	13,50
TA80300173	1,73	3,00	38	12,00	13,50
TA80300174	1,74	3,00	38	12,00	13,50
TA80300175	1,75	3,00	38	12,00	13,50
TA80300176	1,76	3,00	38	12,00	13,50
TA80300177	1,77	3,00	38	12,00	13,50
TA80300178	1,78	3,00	38	12,00	13,50
TA80300179	1,79	3,00	38	12,00	13,50
TA80300180	1,80	3,00	38	12,00	13,50
TA80300181	1,81	3,00	38	12,00	13,50
TA80300182	1,82	3,00	38	12,00	13,50
TA80300183	1,83	3,00	38	12,00	13,50
TA80300184	1,84	3,00	38	12,00	13,50
TA80300185	1,85	3,00	38	12,00	13,50
TA80300186	1,86	3,00	38	12,00	13,50
TA80300187	1,87	3,00	38	12,00	13,50
TA80300188	1,88	3,00	38	12,00	13,50
TA80300189	1,89	3,00	38	12,00	13,50
TA80300190	1,90	3,00	38	12,00	13,50
TA80300191	1,91	3,00	38	12,00	13,50
TA80300192	1,92	3,00	38	12,00	13,50
TA80300193	1,93	3,00	38	12,00	13,50
TA80300194	1,94	3,00	38	12,00	13,50
TA80300195	1,95	3,00	38	12,00	13,50
TA80300196	1,96	3,00	38	12,00	13,50
TA80300197	1,97	3,00	38	12,00	13,50
TA80300198	1,98	3,00	38	12,00	13,50
TA80300199	1,99	3,00	38	12,00	13,50
TA80300200	2,00	3,00	50	12,00	13,50
TA80300205	2,05	3,00	50	15,00	16,80
TA80300210	2,10	3,00	50	15,00	16,80
TA80300215	2,15	3,00	50	15,00	16,80
TA80300220	2,20	3,00	50	15,00	16,80
TA80300225	2,25	3,00	50	15,00	16,80
TA80300230	2,30	3,00	50	15,00	16,80
TA80300235	2,35	3,00	50	15,00	16,80
TA80300240	2,40	3,00	50	15,00	16,80
TA80300245	2,45	3,00	50	15,00	16,80
TA80300250	2,50	3,00	50	15,00	16,80
TA80300255	2,55	3,00	50	18,00	20,10
TA80300260	2,60	3,00	50	18,00	20,10
TA80300265	2,65	3,00	50	18,00	20,10
TA80300270	2,70	3,00	50	18,00	20,10
TA80300275	2,75	3,00	50	18,00	20,10
TA80300280	2,80	3,00	50	18,00	20,10
TA80300285	2,85	3,00	50	18,00	20,10
TA80300290	2,90	3,00	50	18,00	20,10
TA80300295	2,95	3,00	50	18,00	20,10
TA80300300	3,00	3,00	50	18,00	20,10

Notes

MTB25N

Punta centesimale senza canalini
Hundredth drill without coolant holes
Hundertstel-Bohrer ohne innere Kühlkanälen
Foret centésimales sans arrosage interne

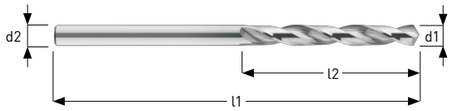






Z
2

TUSA
NORM



P M K N H O



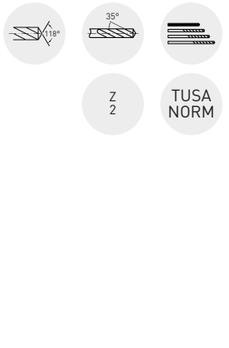
Art. Tusa Precision	d1 h6	d2 h6	l1 0/+1.0	l2 0/+1.0
MTB25N0030 - MTB25N0039	0,30-0,39	0,30-0,39	30	4,00
MTB25N0040 - MTB25N0049	0,40-0,49	0,40-0,49	30	5,00
MTB25N0050 - MTB25N0059	0,50-0,59	0,50-0,59	30	6,00
MTB25N0060 - MTB25N0069	0,60-0,69	0,60-0,69	30	6,00
MTB25N0070 - MTB25N0079	0,70-0,79	0,70-0,79	40	12,00
MTB25N0080 - MTB25N0089	0,80-0,89	0,80-0,89	40	12,00
MTB25N0090 - MTB25N0099	0,90-0,99	0,90-0,99	40	12,00
MTB25N0100 - MTB25N0109	1,00-1,09	1,00-1,09	40	15,00
MTB25N0110 - MTB25N0119	1,10-1,19	1,10-1,19	40	15,00
MTB25N0120 - MTB25N0129	1,20-1,29	1,20-1,29	40	15,00
MTB25N0130 - MTB25N0139	1,30-1,39	1,30-1,39	40	16,00
MTB25N0140 - MTB25N0149	1,40-1,49	1,40-1,49	40	16,00
MTB25N0150 - MTB25N0159	1,50-1,59	1,50-1,59	40	16,00
MTB25N0160 - MTB25N0169	1,60-1,69	1,60-1,69	40	18,00
MTB25N0170 - MTB25N0179	1,70-1,79	1,70-1,79	40	18,00
MTB25N0180 - MTB25N0189	1,80-1,89	1,80-1,89	40	18,00
MTB25N0190 - MTB25N0199	1,90-1,99	1,90-1,99	40	18,00
MTB25N0200 - MTB25N0209	2,00-2,09	2,00-2,09	40	18,00
MTB25N0210 - MTB25N0219	2,10-2,19	2,10-2,19	40	20,00
MTB25N0220 - MTB25N0229	2,20-2,29	2,20-2,29	40	20,00
MTB25N0230 - MTB25N0239	2,30-2,39	2,30-2,39	40	20,00
MTB25N0240 - MTB25N0249	2,40-2,49	2,40-2,49	40	20,00
MTB25N0250 - MTB25N0259	2,50-2,59	2,50-2,59	40	20,00
MTB25N0260 - MTB25N0269	2,60-2,69	2,60-2,69	45	20,00
MTB25N0270 - MTB25N0279	2,70-2,79	2,70-2,79	45	20,00
MTB25N0280 - MTB25N0289	2,80-2,89	2,80-2,89	45	20,00
MTB25N0290 - MTB25N0299	2,90-2,99	2,90-2,99	45	20,00
MTB25N0300	3,00	3,00	45	20,00
MTB25N0305	3,05	3,05	45	20,00
MTB25N0310	3,10	3,10	50	25,00
MTB25N0315	3,15	3,15	50	25,00
MTB25N0320	3,20	3,20	50	25,00
MTB25N0325	3,25	3,25	50	25,00
MTB25N0330	3,30	3,30	50	25,00
MTB25N0335	3,35	3,35	50	25,00
MTB25N0340	3,40	3,40	50	25,00
MTB25N0345	3,45	3,45	50	25,00
MTB25N0350	3,50	3,50	50	25,00
MTB25N0355	3,55	3,55	50	25,00
MTB25N0360	3,60	3,60	55	27,00
MTB25N0365	3,65	3,65	55	27,00
MTB25N0370	3,70	3,70	55	27,00
MTB25N0375	3,75	3,75	55	27,00
MTB25N0380	3,80	3,80	55	27,00
MTB25N0385	3,85	3,85	55	27,00
MTB25N0390	3,90	3,90	55	27,00
MTB25N0395	3,95	3,95	55	27,00
MTB25N0400	4,00	4,00	55	27,00
MTB25N0405	4,05	4,05	55	27,00
MTB25N0410	4,10	4,10	60	30,00
MTB25N0415	4,15	4,15	60	30,00
MTB25N0420	4,20	4,20	60	30,00
MTB25N0425	4,25	4,25	60	30,00
MTB25N0430	4,30	4,30	60	30,00
MTB25N0435	4,35	4,35	60	30,00
MTB25N0440	4,40	4,40	60	30,00
MTB25N0445	4,45	4,45	60	30,00
MTB25N0450	4,50	4,50	60	30,00
MTB25N0455	4,55	4,55	60	30,00
MTB25N0460	4,60	4,60	60	30,00
MTB25N0465	4,65	4,65	60	30,00
MTB25N0470	4,70	4,70	60	30,00
MTB25N0475	4,75	4,75	60	30,00
MTB25N0480	4,80	4,80	60	30,00
MTB25N0485	4,85	4,85	60	30,00
MTB25N0490	4,90	4,90	60	30,00
MTB25N0495	4,95	4,95	60	30,00
MTB25N0500	5,00	5,00	60	30,00
MTB25N0505	5,05	5,05	60	30,00
MTB25N0510	5,10	5,10	65	40,00
MTB25N0515	5,15	5,15	65	40,00
MTB25N0520	5,20	5,20	65	40,00
MTB25N0525	5,25	5,25	65	40,00
MTB25N0530	5,30	5,30	65	40,00
MTB25N0535	5,35	5,35	65	40,00
MTB25N0540	5,40	5,40	65	40,00
MTB25N0545	5,45	5,45	65	40,00
MTB25N0550	5,50	5,50	65	40,00
MTB25N0555	5,55	5,55	65	40,00
MTB25N0560	5,60	5,60	65	40,00
MTB25N0565	5,65	5,65	65	40,00
MTB25N0570	5,70	5,70	65	40,00
MTB25N0575	5,75	5,75	65	40,00
MTB25N0580	5,80	5,80	65	40,00
MTB25N0585	5,85	5,85	65	40,00
MTB25N0590	5,90	5,90	65	40,00
MTB25N0595	5,95	5,95	65	40,00
MTB25N0600	6,00	6,00	65	40,00
MTB25N0610	6,10	6,10	65	40,00
MTB25N0620	6,20	6,20	65	40,00
MTB25N0630	6,30	6,30	65	40,00
MTB25N0640	6,40	6,40	65	40,00
MTB25N0650	6,50	6,50	65	40,00
MTB25N0660	6,60	6,60	65	40,00
MTB25N0670	6,70	6,70	65	40,00
MTB25N0680	6,80	6,80	65	40,00

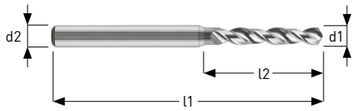
Art. Tusa Precision	d1 h6	d2 h6	l1 0/+1.0	l2 0/+1.0
MTB25N0690	6,90	6,90	65	40,00
MTB25N0700	7,00	7,00	65	40,00
MTB25N0720	7,20	7,20	80	40,00
MTB25N0750	7,50	7,50	80	40,00
MTB25N0800	8,00	8,00	80	40,00
MTB25N0850	8,50	8,50	80	40,00
MTB25N0900	9,00	9,00	80	40,00
MTB25N0950	9,50	9,50	80	40,00
MTB25N1000	10,00	10,00	100	50,00
MTB25N1050	10,50	10,50	100	50,00
MTB25N1100	11,00	11,00	100	50,00
MTB25N1150	11,50	11,50	100	50,00
MTB25N1200	12,00	12,00	100	50,00
MTB25N1250	12,50	12,50	100	50,00
MTB25N1300	13,00	13,00	100	50,00

Notes

TA35

Micropunta elicoidale - serie corta
Micro twist drill - short series
Micro-Spiralbohrer - kurze serie
Micro-foret hélicoïdal - série courte





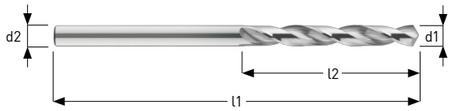
P M K N H O

Art. Tusa Precision	d1 h6	d2 h6	l1 0/+1.0	l2 0/+1.0
TA35000020	0,20	1,00	30	3,00
TA35000025	0,25	1,00	30	3,00
TA35000030	0,30	1,00	30	3,00
TA35000035	0,35	1,00	30	4,00
TA35000040	0,40	1,00	30	4,00
TA35000045	0,45	1,00	30	6,00
TA35000050	0,50	1,00	30	6,00
TA35000055	0,55	1,00	30	6,00
TA35000060	0,60	1,00	30	6,00
TA35000065	0,65	1,00	30	7,00
TA35000070	0,70	1,00	30	7,00
TA35000075	0,75	1,50	30	8,00
TA35000080	0,80	1,50	30	8,00
TA35000085	0,85	1,50	30	8,00
TA35000090	0,90	1,50	30	8,00
TA35000095	0,95	1,50	30	10,00
TA35000100	1,00	1,50	30	10,00
TA35000105	1,05	1,50	30	10,00
TA35000110	1,10	1,50	30	10,00
TA35000113	1,13	1,50	30	10,00
TA35000115	1,15	1,50	30	12,00
TA35000120	1,20	1,50	30	12,00
TA35000125	1,25	1,50	30	12,00
TA35000130	1,30	1,50	30	12,00
TA35000135	1,35	1,50	30	12,00
TA35000140	1,40	1,50	30	12,00
TA35000145	1,45	1,50	30	12,00
TA35000150	1,50	2,00	30	12,00
TA35000155	1,55	2,00	30	12,00
TA35000160	1,60	2,00	30	12,00
TA35000165	1,65	2,00	30	12,00
TA35000170	1,70	2,00	30	12,00
TA35000175	1,75	2,00	30	12,00
TA35000180	1,80	2,00	30	12,00
TA35000185	1,85	2,00	30	12,00
TA35000190	1,90	2,00	30	12,00
TA35000195	1,95	2,00	30	12,00
TA35000200	2,00	2,50	30	12,00

MTB25

Micropunta elicoidale - serie corta
Micro twist drill - short series
Micro-Spiralbohrer - kurze Serie
Micro-foret hélicoïdal - série courte





P M K N O

Art. Tusa Precision	d1 h6	d2 h6	l1 0/+1.0	l2 0/+1.0
MTB2500050	0,50	0,50	20	3,00
MTB2500060	0,60	0,60	21	4,00
MTB2500070	0,70	0,70	23	5,00
MTB2500080	0,80	0,80	24	5,00
MTB2500090	0,90	0,90	25	6,00
MTB2500100	1,00	1,00	26	6,00
MTB2500110	1,10	1,10	28	7,00
MTB2500120	1,20	1,20	30	8,00
MTB2500130	1,30	1,30	30	8,00
MTB2500140	1,40	1,40	32	9,00
MTB2500150	1,50	1,50	32	9,00
MTB2500160	1,60	1,60	34	10,00
MTB2500170	1,70	1,70	34	10,00
MTB2500180	1,80	1,80	36	11,00
MTB2500190	1,90	1,90	36	11,00
MTB2500200	2,00	2,00	38	12,00
MTB2500210	2,10	2,10	38	12,00
MTB2500220	2,20	2,20	40	13,00
MTB2500230	2,30	2,30	40	13,00
MTB2500240	2,40	2,40	43	14,00
MTB2500250	2,50	2,50	43	14,00
MTB2500260	2,60	2,60	43	14,00
MTB2500270	2,70	2,70	46	16,00
MTB2500280	2,80	2,80	46	16,00
MTB2500290	2,90	2,90	46	16,00
MTB2500300	3,00	3,00	46	16,00
MTB2500310	3,10	3,10	49	18,00
MTB2500320	3,20	3,20	49	18,00
MTB2500330	3,30	3,30	49	18,00
MTB2500340	3,40	3,40	52	20,00
MTB2500350	3,50	3,50	52	20,00
MTB2500360	3,60	3,60	52	20,00
MTB2500370	3,70	3,70	52	20,00
MTB2500380	3,80	3,80	55	22,00
MTB2500390	3,90	3,90	55	22,00
MTB2500400	4,00	4,00	55	22,00
MTB2500410	4,10	4,10	55	22,00
MTB2500420	4,20	4,20	55	22,00
MTB2500430	4,30	4,30	58	24,00
MTB2500440	4,40	4,40	58	24,00

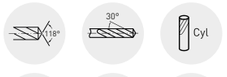
Art. Tusa Precision	d1 h6	d2 h6	l1 0/+1.0	l2 0/+1.0
MTB2500450	4,50	4,50	58	24,00
MTB2500460	4,60	4,60	58	24,00
MTB2500470	4,70	4,70	58	24,00
MTB2500480	4,80	4,80	62	26,00
MTB2500490	4,90	4,90	62	26,00
MTB2500500	5,00	5,00	62	26,00
MTB2500510	5,10	5,10	62	26,00
MTB2500520	5,20	5,20	62	26,00
MTB2500530	5,30	5,30	62	26,00
MTB2500540	5,40	5,40	66	28,00
MTB2500550	5,50	5,50	66	28,00
MTB2500560	5,60	5,60	66	28,00
MTB2500570	5,70	5,70	66	28,00
MTB2500580	5,80	5,80	66	28,00
MTB2500590	5,90	5,90	66	28,00
MTB2500600	6,00	6,00	66	28,00
MTB2500610	6,10	6,10	70	31,00
MTB2500620	6,20	6,20	70	31,00
MTB2500630	6,30	6,30	70	31,00
MTB2500640	6,40	6,40	70	31,00
MTB2500650	6,50	6,50	70	31,00
MTB2500660	6,60	6,60	70	31,00
MTB2500670	6,70	6,70	70	31,00
MTB2500680	6,80	6,80	74	34,00
MTB2500690	6,90	6,90	74	34,00
MTB2500700	7,00	7,00	74	34,00
MTB2500710	7,10	7,10	74	34,00
MTB2500720	7,20	7,20	74	34,00
MTB2500730	7,30	7,30	74	34,00
MTB2500740	7,40	7,40	74	34,00
MTB2500750	7,50	7,50	74	34,00
MTB2500760	7,60	7,60	79	37,00
MTB2500770	7,70	7,70	79	37,00
MTB2500780	7,80	7,80	79	37,00
MTB2500790	7,90	7,90	79	37,00
MTB2500800	8,00	8,00	79	37,00
MTB2500810	8,10	8,10	79	37,00
MTB2500820	8,20	8,20	79	37,00
MTB2500830	8,30	8,30	79	37,00
MTB2500840	8,40	8,40	79	37,00
MTB2500850	8,50	8,50	79	37,00
MTB2500860	8,60	8,60	84	40,00
MTB2500870	8,70	8,70	84	40,00
MTB2500880	8,80	8,80	84	40,00
MTB2500890	8,90	8,90	84	40,00
MTB2500900	9,00	9,00	84	40,00
MTB2500910	9,10	9,10	84	40,00
MTB2500920	9,20	9,20	84	40,00
MTB2500930	9,30	9,30	84	40,00
MTB2500940	9,40	9,40	84	40,00
MTB2500950	9,50	9,50	84	43,00
MTB2500960	9,60	9,60	89	43,00
MTB2500970	9,70	9,70	89	43,00
MTB2500980	9,80	9,80	89	43,00
MTB2500990	9,90	9,90	89	43,00
MTB2501000	10,00	10,00	89	43,00

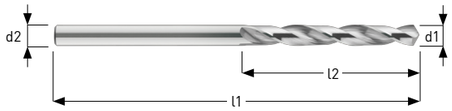
Art. Tusa Precision	d1 h6	d2 h6	l1 0/+1.0	l2 0/+1.0
MTB2501010	10,10	10,10	89	43,00
MTB2501050	10,50	10,50	89	43,00
MTB2501100	11,00	11,00	95	47,00
MTB2501150	11,50	11,50	95	47,00
MTB2501180	11,80	11,80	95	47,00
MTB2501200	12,00	12,00	102	51,00
MTB2501250	12,50	12,50	102	51,00
MTB2501270	12,70	12,70	102	51,00
MTB2501300	13,00	13,00	102	51,00
MTB2501350	13,50	13,50	102	51,00
MTB2501400	14,00	14,00	107	54,00
MTB2501450	14,50	14,50	107	56,00
MTB2501500	15,00	15,00	111	56,00
MTB2501600	16,00	16,00	115	58,00
MTB2501800	18,00	18,00	123	62,00
MTB2502000	20,00	20,00	131	66,00

Notes

MTB33

Micropunta elicoidale - serie corta
Micro twist drill - short series
Micro-Spiralbohrer - kurze serie
Micro-foret hélicoïdal - série courte





P M K N O



Art. Tusa Precision	d1 h6	d2 h6	l1 0/+1.0	l2 0/+1.0
MTB3300100	1,00	1,00	26	6,00
MTB3300105	1,05	1,05	26	6,00
MTB3300110	1,10	1,10	28	7,00
MTB3300115	1,15	1,15	28	7,00
MTB3300120	1,20	1,20	30	8,00
MTB3300125	1,25	1,25	30	8,00
MTB3300130	1,30	1,30	30	8,00
MTB3300135	1,35	1,35	32	9,00
MTB3300140	1,40	1,40	32	9,00
MTB3300145	1,45	1,45	32	9,00
MTB3300150	1,50	1,50	32	9,00
MTB3300155	1,55	1,55	34	10,00
MTB3300160	1,60	1,60	34	10,00
MTB3300165	1,65	1,65	34	10,00
MTB3300170	1,70	1,70	34	10,00
MTB3300175	1,75	1,75	36	11,00
MTB3300180	1,80	1,80	36	11,00
MTB3300185	1,85	1,85	36	11,00
MTB3300190	1,90	1,90	36	11,00
MTB3300195	1,95	1,95	38	12,00
MTB3300200	2,00	2,00	38	12,00
MTB3300205	2,05	2,05	38	12,00
MTB3300210	2,10	2,10	38	12,00
MTB3300215	2,15	2,15	40	13,00
MTB3300220	2,20	2,20	40	13,00
MTB3300225	2,25	2,25	40	13,00
MTB3300230	2,30	2,30	40	13,00
MTB3300235	2,35	2,35	40	13,00
MTB3300240	2,40	2,40	43	14,00
MTB3300245	2,45	2,45	43	14,00
MTB3300250	2,50	2,50	43	14,00
MTB3300255	2,55	2,55	43	14,00
MTB3300260	2,60	2,60	43	14,00
MTB3300265	2,65	2,65	43	14,00
MTB3300270	2,70	2,70	46	16,00
MTB3300275	2,75	2,75	46	16,00
MTB3300280	2,80	2,80	46	16,00
MTB3300285	2,85	2,85	46	16,00
MTB3300290	2,90	2,90	46	16,00
MTB3300295	2,95	2,95	46	16,00

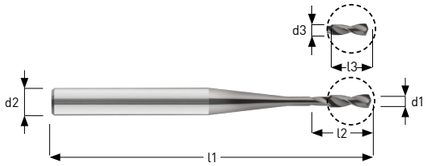
Art. Tusa Precision	d1 h6	d2 h6	l1 0/+1.0	l2 0/+1.0
MTB3300300	3,00	3,00	46	16,00
MTB3300350	3,50	3,50	52	20,00
MTB3300400	4,00	4,00	55	22,00
MTB3300450	4,50	4,50	58	24,00
MTB3300500	5,00	5,00	62	26,00
MTB3300550	5,50	5,50	66	28,00
MTB3300600	6,00	6,00	70	28,00
MTB3300650	6,50	6,50	70	31,00
MTB3300700	7,00	7,00	74	34,00
MTB3300750	7,50	7,50	74	34,00
MTB3300800	8,00	8,00	79	37,00
MTB3300850	8,50	8,50	79	37,00
MTB3300900	9,00	9,00	84	40,00
MTB3300950	9,50	9,50	84	40,00
MTB3301000	10,00	10,00	89	43,00
MTB3301050	10,50	10,50	89	43,00
MTB3301100	11,00	11,00	95	47,00
MTB3301200	12,00	12,00	102	51,00

Notes

TA303B

Micropunta elicoidale con svasatura posteriore - serie corta
Combination drill with back chamfer - short series
Mikrobohrer mit Rückwärtsentgrater - kurze serie
Micro-foret hélicoïdal avec chanfrein postérieur - série courte

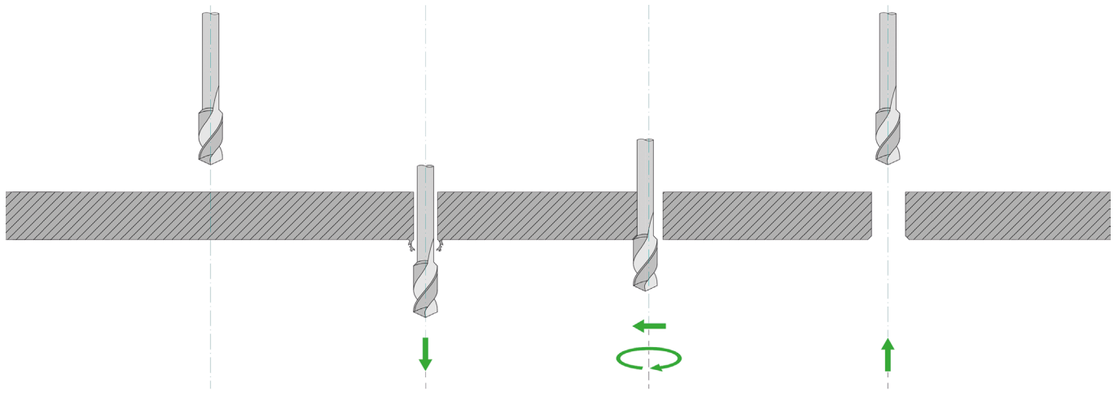






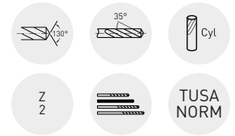
P M K N O

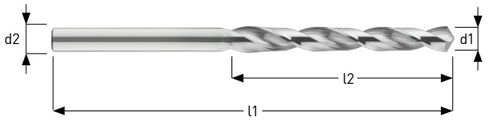
Art. Tusa Precision	d1 h5	d2 h6	d3 0/0.0025	l1 0/+0.5	l2 0/+0.5	l3 +/-0.1
TA303B0050	0,50	3,00	0,34	50	3,00	1,50
TA303B0060	0,60	3,00	0,40	50	3,60	1,80
TA303B0070	0,70	3,00	0,47	50	4,20	2,10
TA303B0080	0,80	3,00	0,54	50	4,80	2,40
TA303B0090	0,90	3,00	0,60	50	5,40	2,70
TA303B0100	1,00	3,00	0,67	50	6,00	3,00
TA303B0110	1,10	3,00	0,74	50	6,60	3,30
TA303B0120	1,20	3,00	0,80	50	7,20	3,60
TA303B0130	1,30	3,00	0,87	50	7,80	3,90
TA303B0140	1,40	3,00	0,94	50	8,40	4,20
TA303B0150	1,50	3,00	1,01	50	9,00	4,50
TA303B0160	1,60	4,00	1,07	60	9,60	4,80
TA303B0170	1,70	4,00	1,14	60	10,20	5,10
TA303B0180	1,80	4,00	1,21	60	10,80	5,40
TA303B0190	1,90	4,00	1,27	60	11,40	5,70
TA303B0200	2,00	4,00	1,34	60	12,00	6,00
TA303B0210	2,10	6,00	1,41	70	12,60	6,30
TA303B0220	2,20	6,00	1,47	70	13,20	6,60
TA303B0230	2,30	6,00	1,54	70	13,80	6,90
TA303B0240	2,40	6,00	1,61	70	14,40	7,20
TA303B0250	2,50	6,00	1,68	70	15,00	7,50
TA303B0260	2,60	6,00	1,74	70	15,60	7,80
TA303B0270	2,70	6,00	1,81	70	16,20	8,10
TA303B0280	2,80	6,00	1,88	70	16,80	8,40
TA303B0290	2,90	6,00	1,94	70	17,40	8,70
TA303B0300	3,00	6,00	2,01	70	18,00	9,00



TC35

Micropunta elicoidale - serie media
Micro twist drill - medium series
Micro-Spiralbohrer - mittelere Serie
Micro-foret hélicoïdal - série moyenne







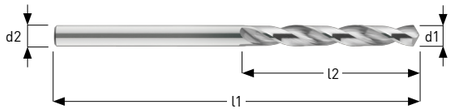
P M K N S O

Art. Tusa Precision	d1 h6	d2 h6	l1 0/+1.0	l2 0/+1.0
TC35000030	0,30	0,30	30	6,00
TC35000035	0,35	0,35	30	6,00
TC35000040	0,40	0,40	30	6,00
TC35000045	0,45	0,45	38	9,00
TC35000050	0,50	0,50	38	9,00
TC35000055	0,55	0,55	38	9,00
TC35000060	0,60	0,60	38	9,00
TC35000065	0,65	0,65	38	13,00
TC35000070	0,70	0,70	38	13,00
TC35000075	0,75	0,75	38	13,00
TC35000080	0,80	0,80	38	13,00
TC35000085	0,85	0,85	38	16,00
TC35000090	0,90	0,90	38	16,00
TC35000095	0,95	0,95	38	16,00
TC35000100	1,00	1,00	38	16,00
TC35000105	1,05	1,05	38	16,00
TC35000110	1,10	1,10	38	16,00
TC35000115	1,15	1,15	38	16,00
TC35000120	1,20	1,20	38	16,00
TC35000125	1,25	1,25	38	16,00
TC35000130	1,30	1,30	38	16,00
TC35000135	1,35	1,35	38	16,00
TC35000140	1,40	1,40	38	16,00
TC35000145	1,45	1,45	38	16,00
TC35000150	1,50	1,50	38	16,00
TC35000155	1,55	1,55	38	16,00
TC35000160	1,60	1,60	38	16,00
TC35000165	1,65	1,65	38	16,00
TC35000170	1,70	1,70	38	16,00
TC35000175	1,75	1,75	38	16,00
TC35000180	1,80	1,80	38	16,00
TC35000185	1,85	1,85	38	16,00
TC35000190	1,90	1,90	38	16,00
TC35000195	1,95	1,95	38	16,00
TC35000200	2,00	2,00	38	16,00

MTB30

Micropunta elicoidale - serie media
Micro twist drill - medium series
Micro-Spiralbohrer - mittelere Serie
Micro-foret hélicoïdal - série moyenne







P M K N O

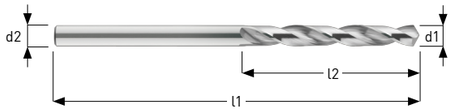
Art. Tusa Precision	d1 h6	d2 h6	l1 0/+1.0	l2 0/+1.0
MTB3000080	0,80	0,80	30	10,00
MTB3000090	0,90	0,90	32	11,00
MTB3000100	1,00	1,00	34	12,00
MTB3000110	1,10	1,10	36	14,00
MTB3000120	1,20	1,20	38	16,00
MTB3000130	1,30	1,30	38	16,00
MTB3000140	1,40	1,40	40	18,00
MTB3000150	1,50	1,50	40	18,00
MTB3000160	1,60	1,60	43	20,00
MTB3000170	1,70	1,70	43	20,00
MTB3000180	1,80	1,80	46	22,00
MTB3000190	1,90	1,90	46	22,00
MTB3000200	2,00	2,00	49	24,00
MTB3000210	2,10	2,10	49	24,00
MTB3000220	2,20	2,20	53	27,00
MTB3000230	2,30	2,30	53	27,00
MTB3000240	2,40	2,40	57	30,00
MTB3000250	2,50	2,50	57	30,00
MTB3000260	2,60	2,60	57	30,00
MTB3000270	2,70	2,70	61	33,00
MTB3000280	2,80	2,80	61	33,00
MTB3000290	2,90	2,90	61	33,00
MTB3000300	3,00	3,00	61	33,00
MTB3000310	3,10	3,10	65	36,00
MTB3000320	3,20	3,20	65	36,00
MTB3000330	3,30	3,30	65	36,00
MTB3000340	3,40	3,40	70	39,00
MTB3000350	3,50	3,50	70	39,00
MTB3000360	3,60	3,60	70	39,00
MTB3000370	3,70	3,70	70	39,00
MTB3000380	3,80	3,80	75	43,00
MTB3000390	3,90	3,90	75	43,00
MTB3000400	4,00	4,00	75	43,00
MTB3000410	4,10	4,10	75	43,00
MTB3000420	4,20	4,20	75	43,00
MTB3000430	4,30	4,30	80	47,00
MTB3000440	4,40	4,40	80	47,00
MTB3000450	4,50	4,50	80	47,00
MTB3000460	4,60	4,60	80	47,00
MTB3000470	4,70	4,70	80	47,00
MTB3000480	4,80	4,80	86	52,00
MTB3000490	4,90	4,90	86	52,00
MTB3000500	5,00	5,00	86	52,00
MTB3000510	5,10	5,10	86	52,00
MTB3000520	5,20	5,20	86	52,00
MTB3000530	5,30	5,30	86	52,00
MTB3000540	5,40	5,40	93	57,00
MTB3000550	5,50	5,50	93	57,00
MTB3000560	5,60	5,60	93	57,00
MTB3000570	5,70	5,70	93	57,00
MTB3000580	5,80	5,80	93	57,00
MTB3000590	5,90	5,90	93	57,00
MTB3000600	6,00	6,00	93	57,00
MTB3000650	6,50	6,50	101	63,00
MTB3000700	7,00	7,00	109	69,00
MTB3000750	7,50	7,50	109	69,00
MTB3000800	8,00	8,00	117	75,00
MTB3000850	8,50	8,50	117	75,00
MTB3000900	9,00	9,00	125	81,00
MTB3000950	9,50	9,50	125	81,00
MTB3001000	10,00	10,00	133	87,00
MTB3001050	10,50	10,50	133	87,00
MTB3001100	11,00	11,00	142	94,00
MTB3001150	11,50	11,50	142	94,00
MTB3001200	12,00	12,00	151	101,00
MTB3001250	12,50	12,50	151	101,00
MTB3001300	13,00	13,00	151	101,00
MTB3001400	14,00	14,00	160	108,00
MTB3001500	15,00	15,00	160	114,00
MTB3001600	16,00	16,00	160	120,00

Notes

MTB35

Micropunta elicoidale - serie media
Micro twist drill - medium series
Micro-Spiralbohrer - mittelere Serie
Micro-foret hélicoïdal - série moyenne





P M K N O



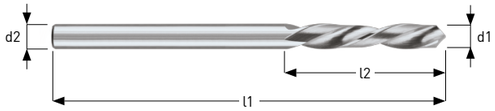
Art. Tusa Precision	d1 h6	d2 h6	l1 0/+1.0	l2 0/+1.0
MTB3500030	0,30	0,30	28	4,00
MTB3500035	0,35	0,35	30	5,00
MTB3500040	0,40	0,40	30	5,00
MTB3500045	0,45	0,45	30	5,00
MTB3500050	0,50	0,50	30	5,00
MTB3500055	0,55	0,55	30	5,00
MTB3500060	0,60	0,60	30	5,00
MTB3500065	0,65	0,65	30	6,00
MTB3500070	0,70	0,70	30	6,00
MTB3500075	0,75	0,75	30	8,00
MTB3500080	0,80	0,80	30	8,00
MTB3500085	0,85	0,85	30	9,00
MTB3500090	0,90	0,90	30	9,00
MTB3500095	0,95	0,95	30	10,00
MTB3500100	1,00	1,00	30	10,00
MTB3500105	1,05	1,05	30	10,00
MTB3500110	1,10	1,10	30	10,00
MTB3500115	1,15	1,15	30	12,00
MTB3500120	1,20	1,20	30	12,00
MTB3500125	1,25	1,25	30	12,00
MTB3500130	1,30	1,30	30	12,00
MTB3500135	1,35	1,35	30	12,00
MTB3500140	1,40	1,40	30	12,00
MTB3500145	1,45	1,45	30	12,00
MTB3500150	1,50	1,50	30	12,00
MTB3500155	1,55	1,55	40	16,00
MTB3500160	1,60	1,60	40	16,00
MTB3500165	1,65	1,65	40	16,00
MTB3500170	1,70	1,70	40	16,00
MTB3500175	1,75	1,75	40	16,00
MTB3500180	1,80	1,80	40	16,00
MTB3500185	1,85	1,85	40	16,00
MTB3500190	1,90	1,90	40	16,00
MTB3500195	1,95	1,95	40	16,00
MTB3500200	2,00	2,00	40	16,00
MTB3500205	2,05	2,05	40	18,00
MTB3500210	2,10	2,10	40	18,00
MTB3500215	2,15	2,15	40	18,00
MTB3500230	2,30	2,30	40	18,00
MTB3500235	2,35	2,35	40	18,00
MTB3500240	2,40	2,40	40	18,00
MTB3500245	2,45	2,45	40	18,00
MTB3500250	2,50	2,50	40	18,00
MTB3500255	2,55	2,55	45	18,00
MTB3500260	2,60	2,60	45	18,00
MTB3500265	2,65	2,65	45	18,00
MTB3500270	2,70	2,70	45	18,00
MTB3500275	2,75	2,75	45	18,00
MTB3500280	2,80	2,80	45	18,00
MTB3500285	2,85	2,85	45	18,00
MTB3500290	2,90	2,90	45	18,00
MTB3500295	2,95	2,95	45	18,00
MTB3500300	3,00	3,00	45	18,00
MTB3500310	3,10	3,10	50	20,00
MTB3500315	3,15	3,15	50	20,00
MTB3500317	3,17	3,17	50	20,00
MTB3500320	3,20	3,20	50	20,00
MTB3500330	3,30	3,30	50	20,00
MTB3500340	3,40	3,40	50	20,00
MTB3500350	3,50	3,50	50	20,00
MTB3500360	3,60	3,60	50	20,00
MTB3500370	3,70	3,70	50	20,00
MTB3500380	3,80	3,80	50	20,00
MTB3500390	3,90	3,90	50	20,00
MTB3500400	4,00	4,00	50	20,00
MTB3500410	4,10	4,10	50	25,00
MTB3500420	4,20	4,20	50	25,00
MTB3500430	4,30	4,30	50	25,00
MTB3500440	4,40	4,40	50	25,00
MTB3500450	4,50	4,50	50	25,00
MTB3500460	4,60	4,60	50	25,00
MTB3500470	4,70	4,70	50	25,00
MTB3500480	4,80	4,80	50	25,00
MTB3500490	4,90	4,90	50	25,00
MTB3500500	5,00	5,00	50	25,00
MTB3500510	5,10	5,10	50	25,00
MTB3500520	5,20	5,20	50	25,00
MTB3500530	5,30	5,30	50	25,00
MTB3500540	5,40	5,40	50	25,00
MTB3500550	5,50	5,50	50	25,00
MTB3500560	5,60	5,60	50	25,00
MTB3500570	5,70	5,70	50	25,00
MTB3500580	5,80	5,80	50	25,00
MTB3500590	5,90	5,90	50	25,00
MTB3500600	6,00	6,00	50	25,00

Notes

MTB35L

Micropunta elicoidale con taglio sinistro - serie media
Left-hand micro twist drill - medium series
Linksdrall-Mikro-Spiralbohrer - mittelere Serie
Micro foret hélicoïdal gauche - série moyenne







P M K N H O

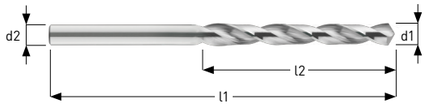
Art. Tusa Precision	d1 h6	d2 h6	l1 0/+1.0	l2 0/+1.0
MTB35L0050	0,50	0,50	30	5,00
MTB35L0055	0,55	0,55	30	5,00
MTB35L0060	0,60	0,60	30	5,00
MTB35L0065	0,65	0,65	30	6,00
MTB35L0070	0,70	0,70	30	6,00
MTB35L0075	0,75	0,75	30	8,00
MTB35L0080	0,80	0,80	30	8,00
MTB35L0085	0,85	0,85	30	9,00
MTB35L0090	0,90	0,90	30	9,00
MTB35L0095	0,95	0,95	30	10,00
MTB35L0100	1,00	1,00	30	10,00
MTB35L0105	1,05	1,05	30	10,00
MTB35L0110	1,10	1,10	30	10,00
MTB35L0115	1,15	1,15	30	12,00
MTB35L0120	1,20	1,20	30	12,00
MTB35L0125	1,25	1,25	30	12,00
MTB35L0130	1,30	1,30	30	12,00
MTB35L0135	1,35	1,35	30	12,00
MTB35L0140	1,40	1,40	30	12,00
MTB35L0145	1,45	1,45	30	12,00
MTB35L0150	1,50	1,50	30	12,00
MTB35L0155	1,55	1,55	40	16,00
MTB35L0160	1,60	1,60	40	16,00
MTB35L0165	1,65	1,65	40	16,00
MTB35L0170	1,70	1,70	40	16,00
MTB35L0175	1,75	1,75	40	16,00
MTB35L0180	1,80	1,80	40	16,00
MTB35L0185	1,85	1,85	40	16,00
MTB35L0190	1,90	1,90	40	16,00
MTB35L0195	1,95	1,95	40	16,00
MTB35L0200	2,00	2,00	40	16,00
MTB35L0205	2,05	2,05	40	18,00
MTB35L0210	2,10	2,10	40	18,00
MTB35L0215	2,15	2,15	40	18,00
MTB35L0220	2,20	2,20	40	18,00
MTB35L0225	2,25	2,25	40	18,00
MTB35L0230	2,30	2,30	40	18,00
MTB35L0235	2,35	2,35	40	18,00
MTB35L0240	2,40	2,40	40	18,00
MTB35L0245	2,45	2,45	40	18,00
MTB35L0250	2,50	2,50	40	18,00
MTB35L0255	2,55	2,55	45	18,00
MTB35L0260	2,60	2,60	45	18,00
MTB35L0265	2,65	2,65	45	18,00
MTB35L0270	2,70	2,70	45	18,00
MTB35L0275	2,75	2,75	45	18,00
MTB35L0280	2,80	2,80	45	18,00
MTB35L0285	2,85	2,85	45	18,00
MTB35L0290	2,90	2,90	45	18,00
MTB35L0295	2,95	2,95	45	18,00
MTB35L0300	3,00	3,00	45	18,00
MTB35L0310	3,10	3,10	50	20,00
MTB35L0317	3,17	3,17	50	20,00
MTB35L0320	3,20	3,20	50	20,00
MTB35L0330	3,30	3,30	50	20,00
MTB35L0340	3,40	3,40	50	20,00
MTB35L0350	3,50	3,50	50	20,00
MTB35L0360	3,60	3,60	50	20,00
MTB35L0370	3,70	3,70	50	20,00
MTB35L0380	3,80	3,80	50	20,00
MTB35L0390	3,90	3,90	50	20,00
MTB35L0400	4,00	4,00	50	20,00
MTB35L0410	4,10	4,10	50	25,00
MTB35L0420	4,20	4,20	50	25,00
MTB35L0430	4,30	4,30	50	25,00
MTB35L0440	4,40	4,40	50	25,00
MTB35L0450	4,50	4,50	50	25,00
MTB35L0460	4,60	4,60	50	25,00
MTB35L0470	4,70	4,70	50	25,00
MTB35L0480	4,80	4,80	50	25,00
MTB35L0490	4,90	4,90	50	25,00
MTB35L0500	5,00	5,00	50	25,00
MTB35L0510	5,10	5,10	50	25,00
MTB35L0520	5,20	5,20	50	25,00
MTB35L0530	5,30	5,30	50	25,00
MTB35L0540	5,40	5,40	50	25,00
MTB35L0550	5,50	5,50	50	25,00
MTB35L0560	5,60	5,60	50	25,00
MTB35L0570	5,70	5,70	50	25,00
MTB35L0580	5,80	5,80	50	25,00
MTB35L0590	5,90	5,90	50	25,00
MTB35L0600	6,00	6,00	50	25,00

Notes

MTB45

Micropunta elicoidale - serie lunga
Micro twist drill - long series
Micro-Spiralbohrer - lange Serie
Micro-foret hélicoïdal - série longue





P M K N H O



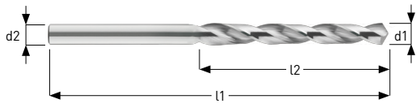
Art. Tusa Precision	d1 h6	d2 h6	l1 0/+1.0	l2 0/+1.0
MTB4500030	0,30	0,30	40	8,00
MTB4500040	0,40	0,40	40	8,00
MTB4500050	0,50	0,50	40	8,00
MTB4500060	0,60	0,60	40	8,00
MTB4500070	0,70	0,70	50	15,00
MTB4500080	0,80	0,80	50	15,00
MTB4500090	0,90	0,90	50	15,00
MTB4500100	1,00	1,00	50	16,00
MTB4500110	1,10	1,10	50	16,00
MTB4500120	1,20	1,20	50	18,00
MTB4500130	1,30	1,30	50	18,00
MTB4500140	1,40	1,40	50	18,00
MTB4500150	1,50	1,50	50	24,00
MTB4500160	1,60	1,60	55	24,00
MTB4500170	1,70	1,70	55	24,00
MTB4500180	1,80	1,80	55	24,00
MTB4500190	1,90	1,90	55	24,00
MTB4500200	2,00	2,00	55	24,00
MTB4500210	2,10	2,10	55	24,00
MTB4500220	2,20	2,20	58	26,00
MTB4500230	2,30	2,30	58	26,00
MTB4500240	2,40	2,40	61	26,00
MTB4500250	2,50	2,50	61	26,00
MTB4500260	2,60	2,60	64	28,00
MTB4500270	2,70	2,70	64	28,00
MTB4500280	2,80	2,80	67	30,00
MTB4500290	2,90	2,90	71	30,00
MTB4500300	3,00	3,00	71	30,00
MTB4500310	3,10	3,10	71	32,00
MTB4500320	3,20	3,20	71	32,00
MTB4500330	3,30	3,30	73	35,00
MTB4500340	3,40	3,40	73	35,00
MTB4500350	3,50	3,50	73	35,00
MTB4500360	3,60	3,60	76	37,00
MTB4500370	3,70	3,70	76	37,00
MTB4500380	3,80	3,80	76	37,00
MTB4500390	3,90	3,90	79	37,00
MTB4500400	4,00	4,00	83	40,00
MTB4500410	4,10	4,10	83	40,00
MTB4500420	4,20	4,20	83	40,00
MTB4500430	4,30	4,30	83	40,00
MTB4500440	4,40	4,40	86	42,00
MTB4500450	4,50	4,50	86	42,00
MTB4500460	4,60	4,60	86	42,00
MTB4500470	4,70	4,70	89	42,00
MTB4500480	4,80	4,80	89	42,00
MTB4500490	4,90	4,90	92	45,00
MTB4500500	5,00	5,00	92	45,00
MTB4500510	5,10	5,10	92	45,00
MTB4500520	5,20	5,20	95	45,00
MTB4500530	5,30	5,30	95	45,00
MTB4500540	5,40	5,40	95	45,00
MTB4500550	5,50	5,50	95	45,00
MTB4500560	5,60	5,60	98	45,00
MTB4500570	5,70	5,70	98	45,00
MTB4500580	5,80	5,80	98	45,00
MTB4500590	5,90	5,90	98	45,00
MTB4500600	6,00	6,00	102	50,00
MTB4500610	6,10	6,10	102	50,00
MTB4500620	6,20	6,20	102	50,00
MTB4500630	6,30	6,30	102	50,00
MTB4500640	6,40	6,40	105	50,00
MTB4500650	6,50	6,50	105	50,00
MTB4500660	6,60	6,60	105	50,00
MTB4500670	6,70	6,70	105	50,00
MTB4500680	6,80	6,80	105	50,00
MTB4500690	6,90	6,90	105	50,00
MTB4500700	7,00	7,00	105	50,00
MTB4500710	7,10	7,10	108	52,00
MTB4500720	7,20	7,20	108	52,00
MTB4500730	7,30	7,30	108	52,00
MTB4500740	7,40	7,40	111	52,00
MTB4500750	7,50	7,50	111	52,00
MTB4500760	7,60	7,60	111	52,00
MTB4500770	7,70	7,70	114	55,00
MTB4500780	7,80	7,80	114	55,00
MTB4500790	7,90	7,90	114	55,00
MTB4500800	8,00	8,00	117	60,00
MTB4500850	8,50	8,50	121	60,00
MTB4500900	9,00	9,00	124	65,00
MTB4500950	9,50	9,50	127	65,00
MTB4501000	10,00	10,00	130	70,00
MTB4501050	10,50	10,50	137	70,00
MTB4501100	11,00	11,00	140	70,00
MTB4501150	11,50	11,50	143	70,00
MTB4501200	12,00	12,00	149	70,00
MTB4501250	12,50	12,50	149	70,00
MTB4501300	13,00	13,00	149	70,00

Notes

MTB50

Micropunta elicoidale - serie lunga
Micro twist drill - long series
Micro-Spiralbohrer - lange Serie
Micro-foret hélicoïdal - série longue







P M K N H O

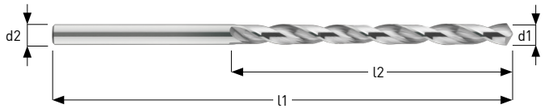
Art. Tusa Precision	d1 h6	d2 h6	l1 0/+1.0	l2 0/+1.0
MTB5000100	1,00	1,00	75	25,00
MTB5000110	1,10	1,10	75	25,00
MTB5000120	1,20	1,20	75	25,00
MTB5000130	1,30	1,30	75	25,00
MTB5000140	1,40	1,40	75	30,00
MTB5000150	1,50	1,50	75	30,00
MTB5000160	1,60	1,60	75	30,00
MTB5000170	1,70	1,70	75	30,00
MTB5000180	1,80	1,80	75	30,00
MTB5000190	1,90	1,90	75	30,00
MTB5000200	2,00	2,00	75	30,00
MTB5000210	2,10	2,10	75	30,00
MTB5000220	2,20	2,20	75	30,00
MTB5000230	2,30	2,30	75	30,00
MTB5000240	2,40	2,40	100	35,00
MTB5000250	2,50	2,50	100	35,00
MTB5000260	2,60	2,60	100	35,00
MTB5000270	2,70	2,70	100	35,00
MTB5000280	2,80	2,80	100	35,00
MTB5000290	2,90	2,90	100	35,00
MTB5000300	3,00	3,00	100	50,00
MTB5000310	3,10	3,10	100	50,00
MTB5000320	3,20	3,20	100	50,00
MTB5000330	3,30	3,30	100	50,00
MTB5000340	3,40	3,40	100	50,00
MTB5000350	3,50	3,50	100	50,00
MTB5000360	3,60	3,60	100	50,00
MTB5000370	3,70	3,70	100	50,00
MTB5000380	3,80	3,80	100	50,00
MTB5000390	3,90	3,90	100	50,00
MTB5000400	4,00	4,00	100	50,00
MTB5000410	4,10	4,10	100	50,00
MTB5000420	4,20	4,20	100	50,00
MTB5000430	4,30	4,30	100	50,00
MTB5000440	4,40	4,40	100	50,00
MTB5000450	4,50	4,50	100	50,00
MTB5000460	4,60	4,60	100	50,00
MTB5000470	4,70	4,70	100	50,00
MTB5000480	4,80	4,80	100	50,00
MTB5000490	4,90	4,90	100	50,00
MTB5000500	5,00	5,00	150	75,00
MTB5000510	5,10	5,10	150	75,00
MTB5000520	5,20	5,20	150	75,00
MTB5000530	5,30	5,30	150	75,00
MTB5000540	5,40	5,40	150	75,00
MTB5000550	5,50	5,50	150	75,00
MTB5000560	5,60	5,60	150	75,00
MTB5000570	5,70	5,70	150	75,00
MTB5000580	5,80	5,80	150	75,00
MTB5000590	5,90	5,90	150	75,00
MTB5000600	6,00	6,00	150	75,00
MTB5000650	6,50	6,50	150	75,00
MTB5000700	7,00	7,00	150	75,00
MTB5000750	7,50	7,50	150	75,00
MTB5000800	8,00	8,00	150	75,00
MTB5000850	8,50	8,50	150	75,00
MTB5000900	9,00	9,00	150	75,00
MTB5000950	9,50	9,50	150	75,00
MTB5001000	10,00	10,00	150	75,00
MTB5001050	10,50	10,50	200	90,00
MTB5001100	11,00	11,00	200	90,00
MTB5001150	11,50	11,50	200	90,00
MTB5001200	12,00	12,00	200	90,00
MTB5001250	12,50	12,50	200	90,00
MTB5001300	13,00	13,00	200	90,00

Notes

MTB60

Micropunta elicoidale - serie extra lunga
Micro twist drill - extra long series
Micro-Spiralbohrer - extra lange Serie
Micro-foret hélicoïdal - série extra longue







P M K N H O

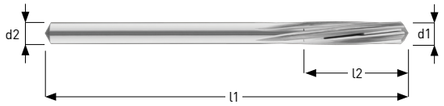
Art. Tusa Precision	d1 h6	d2 h6	l1 0/+1.0	l2 0/+1.0
MTB6000100	1,00	1,00	100	50,00
MTB6000110	1,10	1,10	100	50,00
MTB6000120	1,20	1,20	100	50,00
MTB6000130	1,30	1,30	100	50,00
MTB6000140	1,40	1,40	100	50,00
MTB6000150	1,50	1,50	100	50,00
MTB6000160	1,60	1,60	100	50,00
MTB6000170	1,70	1,70	100	50,00
MTB6000180	1,80	1,80	100	50,00
MTB6000190	1,90	1,90	100	50,00
MTB6000200	2,00	2,00	100	50,00
MTB6000210	2,10	2,10	100	50,00
MTB6000220	2,20	2,20	100	50,00
MTB6000230	2,30	2,30	100	50,00
MTB6000240	2,40	2,40	150	75,00
MTB6000250	2,50	2,50	150	75,00
MTB6000260	2,60	2,60	150	75,00
MTB6000270	2,70	2,70	150	75,00
MTB6000280	2,80	2,80	150	75,00
MTB6000290	2,90	2,90	150	75,00
MTB6000300	3,00	3,00	150	75,00
MTB6000310	3,10	3,10	150	75,00
MTB6000320	3,20	3,20	150	75,00
MTB6000330	3,30	3,30	150	75,00
MTB6000340	3,40	3,40	150	75,00
MTB6000350	3,50	3,50	150	75,00
MTB6000360	3,60	3,60	150	75,00
MTB6000370	3,70	3,70	150	75,00
MTB6000380	3,80	3,80	150	75,00
MTB6000390	3,90	3,90	150	75,00
MTB6000400	4,00	4,00	150	75,00
MTB6000410	4,10	4,10	150	75,00
MTB6000420	4,20	4,20	150	75,00
MTB6000430	4,30	4,30	150	75,00
MTB6000440	4,40	4,40	150	75,00
MTB6000450	4,50	4,50	150	75,00
MTB6000460	4,60	4,60	150	75,00
MTB6000470	4,70	4,70	150	75,00
MTB6000480	4,80	4,80	150	75,00
MTB6000490	4,90	4,90	150	75,00
MTB6000500	5,00	5,00	200	100,00
MTB6000510	5,10	5,10	200	100,00
MTB6000520	5,20	5,20	200	100,00
MTB6000530	5,30	5,30	200	100,00
MTB6000540	5,40	5,40	200	100,00
MTB6000550	5,50	5,50	200	100,00
MTB6000560	5,60	5,60	200	100,00
MTB6000570	5,70	5,70	200	100,00
MTB6000580	5,80	5,80	200	100,00
MTB6000590	5,90	5,90	200	100,00
MTB6000600	6,00	6,00	200	100,00
MTB6000650	6,50	6,50	200	105,00
MTB6000700	7,00	7,00	200	105,00
MTB6000750	7,50	7,50	200	105,00
MTB6000800	8,00	8,00	200	105,00
MTB6000850	8,50	8,50	250	130,00
MTB6000900	9,00	9,00	250	130,00
MTB6000950	9,50	9,50	250	145,00
MTB6001000	10,00	10,00	250	145,00

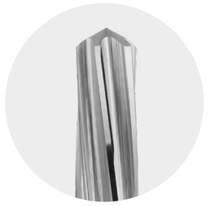
Notes

MS402

Alesatore cilindrico con spirale sinistra e taglio destro
Cylindrical reamer with left-hand helix and right-hand cut
Spiralgenutet Reibahle mit Linksdrall und Rechtsschnitt
Alésoir avec hélice gauche et coupe droite

7° | Z 4-8 | DIN 212





P M K N S H

Art. Tusa Precision	d1 H7	d2 h6	l1 0/+1.0	l2 0/+1.0	Z
MS40200100	1,00	1,00	40	5,00	4
MS40200105	1,05	1,05	40	5,00	4
MS40200110	1,10	1,10	40	7,00	4
MS40200115	1,15	1,15	40	7,00	4
MS40200120	1,20	1,20	40	7,00	4
MS40200125	1,25	1,25	40	7,00	4
MS40200130	1,30	1,30	40	7,00	4
MS40200135	1,35	1,35	40	7,00	4
MS40200140	1,40	1,40	40	8,00	4
MS40200145	1,45	1,45	40	8,00	4
MS40200150	1,50	1,50	40	8,00	4
MS40200155	1,55	1,55	43	8,00	4
MS40200160	1,60	1,60	43	9,00	4
MS40200165	1,65	1,65	43	9,00	4
MS40200170	1,70	1,70	46	10,00	4
MS40200175	1,75	1,75	46	10,00	4
MS40200180	1,80	1,80	46	10,00	4
MS40200185	1,85	1,85	46	10,00	4
MS40200190	1,90	1,90	46	11,00	4
MS40200195	1,95	1,95	46	11,00	4
MS40200197	1,97	1,97	49	11,00	4
MS40200198	1,98	1,98	49	11,00	4
MS40200199	1,99	1,99	49	11,00	4
MS40200200	2,00	2,00	49	11,00	4
MS40200201	2,01	2,01	49	11,00	4
MS40200202	2,02	2,02	49	11,00	4
MS40200203	2,03	2,03	49	11,00	4
MS40200206	2,06	2,06	49	11,00	4
MS40200210	2,10	2,10	49	11,00	4
MS40200215	2,15	2,15	49	11,00	4
MS40200220	2,20	2,20	53	12,00	4
MS40200225	2,25	2,25	53	12,00	4
MS40200230	2,30	2,30	53	12,00	4
MS40200235	2,35	2,35	53	12,00	4
MS40200240	2,40	2,40	57	14,00	4
MS40200245	2,45	2,45	57	14,00	4
MS40200250	2,50	2,50	57	14,00	4
MS40200255	2,55	2,55	57	14,00	4
MS40200260	2,60	2,60	61	14,00	4
MS40200265	2,65	2,65	61	14,00	4
MS40200270	2,70	2,70	61	15,00	4
MS40200275	2,75	2,75	61	15,00	4
MS40200280	2,80	2,80	61	15,00	4
MS40200285	2,85	2,85	61	15,00	4
MS40200290	2,90	2,90	61	15,00	4
MS40200297	2,97	2,97	61	15,00	4
MS40200298	2,98	2,98	61	15,00	4
MS40200299	2,99	2,99	61	15,00	4
MS40200300	3,00	3,00	61	15,00	4
MS40200301	3,01	3,01	65	16,00	4
MS40200302	3,02	3,02	65	16,00	4
MS40200303	3,03	3,03	65	16,00	4
MS40200306	3,06	3,06	65	16,00	4
MS40200310	3,10	3,10	65	16,00	4
MS40200315	3,15	3,15	65	16,00	4
MS40200320	3,20	3,20	65	16,00	4
MS40200325	3,25	3,25	65	16,00	4
MS40200330	3,30	3,30	65	16,00	4
MS40200335	3,35	3,35	70	18,00	4
MS40200340	3,40	3,40	70	18,00	4
MS40200345	3,45	3,45	70	18,00	4
MS40200350	3,50	3,50	70	18,00	4
MS40200355	3,55	3,55	70	18,00	4
MS40200360	3,60	3,60	70	18,00	4
MS40200365	3,65	3,65	70	18,00	4
MS40200370	3,70	3,70	70	18,00	4
MS40200375	3,75	3,75	70	18,00	4
MS40200380	3,80	4,00	75	19,00	4
MS40200385	3,85	4,00	75	19,00	4
MS40200390	3,90	4,00	75	19,00	4
MS40200397	3,97	4,00	75	19,00	4
MS40200398	3,98	4,00	75	19,00	4
MS40200399	3,99	4,00	75	19,00	4
MS40200400	4,00	4,00	75	19,00	4
MS40200450	4,50	4,50	80	21,00	4
MS40200500	5,00	5,00	86	23,00	6
MS40200550	5,50	5,60	93	26,00	6
MS40200600	6,00	5,60	93	26,00	6
MS40200650	6,50	6,30	101	28,00	6
MS40200700	7,00	7,10	109	31,00	6
MS40200750	7,50	7,10	109	31,00	6
MS40200800	8,00	8,00	117	33,00	6
MS40200850	8,50	8,00	117	33,00	6
MS40200900	9,00	9,00	125	36,00	6
MS40200950	9,50	9,00	125	36,00	6
MS40201000	10,00	10,00	133	38,00	6
MS40201050	10,50	10,00	133	38,00	6
MS40201100	11,00	10,00	142	41,00	6
MS40201150	11,50	10,00	142	41,00	6
MS40201200	12,00	10,00	151	44,00	6
MS40201250	12,50	10,00	151	44,00	6
MS40201300	13,00	10,00	151	44,00	6
MS40201350	13,50	12,50	160	47,00	8
MS40201400	14,00	12,50	160	47,00	8
MS40201450	14,50	12,50	162	50,00	8
MS40201500	15,00	12,50	162	50,00	8
MS40201550	15,50	12,50	170	52,00	8
MS40201600	16,00	12,50	170	52,00	8

TA803

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocità di taglio Cutting Speed Ø 0.30-0.50	Ø 0.51-1.00	Ø 1.01-2.00	Ø 2.05-3.00	Avanzamento mm/giro Cutting Feed mm/rev Ø 0.30-0.50	Ø 0.51-1.00	Ø 1.01-2.00	Ø 2.05-3.00
P00	●	5-12	12-35	35-65	35-60	0.003-0.008	0.007-0.015	0.014-0.025	0.023-0.035
P01	●	5-12	12-35	35-65	35-60	0.003-0.008	0.007-0.015	0.014-0.025	0.023-0.035
P02	●	5-12	12-35	35-65	35-60	0.003-0.008	0.007-0.015	0.014-0.025	0.023-0.035
P03	●	4-9	9-28	28-55	28-55	0.002-0.007	0.006-0.014	0.012-0.023	0.021-0.032
P04	●	3,3-7	7-23	23-50	23-50	0.002-0.006	0.005-0.013	0.011-0.02	0.018-0.030
P05	●	4-9	9-28	28-55	28-55	0.002-0.005	0.004-0.011	0.01-0.018	0.016-0.028
P06	●	4-9	9-28	28-55	28-55	0.002-0.005	0.004-0.011	0.01-0.018	0.016-0.028
M01	●	3-8	8-20	18-35	18-35	0.002-0.004	0.003-0.009	0.008-0.016	0.016-0.028
M02	●	3-8	8-20	18-35	18-35	0.002-0.004	0.003-0.009	0.008-0.016	0.016-0.028
M03	●	3-8	8-20	18-35	18-35	0.002-0.004	0.003-0.009	0.008-0.016	0.016-0.028
K01	●	5-12	12-35	35-65	35-60	0.003-0.008	0.007-0.015	0.014-0.025	0.023-0.035
K03	●	4-10	10-30	30-55	30-50	0.002-0.007	0.006-0.014	0.012-0.022	0.02-0.035
K02	●	4-10	10-30	30-55	30-50	0.002-0.007	0.006-0.014	0.012-0.022	0.02-0.035
N01	●	6-19	19-45	45-80	45-80	0.002-0.006	0.005-0.013	0.012-0.02	0.018-0.03
N02	●	5,5-17	17-45	45-70	45-70	0.003-0.007	0.006-0.015	0.014-0.022	0.02-0.035
N03	●	5,5-15	15-35	35-65	35-65	0.003-0.006	0.006-0.013	0.012-0.02	0.018-0.032
N04	◑	5,5-18	15-40	35-70	35-70	0.002-0.006	0.004-0.013	0.009-0.02	0.015-0.032
S01	●	2,5-7	8-18	18-35	18-35	0.002-0.004	0.003-0.007	0.006-0.011	0.01-0.018
S02	●	2,5-7	8-18	18-35	18-35	0.002-0.004	0.003-0.007	0.006-0.011	0.01-0.018
S03	●	2,5-7	8-18	18-35	18-35	0.002-0.004	0.003-0.007	0.006-0.011	0.01-0.018
S04	◑	5-8	6-12	11-20	11-20	0.002-0.006	0.005-0.013	0.012-0.02	0.018-0.03
H01	○	-	-	-	-	-	-	-	-
H02	○	-	-	-	-	-	-	-	-
H03	○	-	-	-	-	-	-	-	-
O01	●	5-12	12-35	35-65	35-60	0.003-0.01	0.009-0.018	0.016-0.028	0.026-0.04
O02	○	-	-	-	-	-	-	-	-
O03	○	-	-	-	-	-	-	-	-
O04	○	-	-	-	-	-	-	-	-
O05	○	-	-	-	-	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

MTB25N

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocità di taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 0.30-0.75	Ø 0.76-0.99	Ø 1.00-2.00	Ø 2.01-4.00	Ø 4.05-6.00	Ø 6.10-8.50	Ø 9.00-13.00
P00	●	10-20	0.005 - 0.012	0.01 - 0.02	0.015-0.03	0.02-0.04	0.03-0.06	0.04-0.08	0.06-0.120
P01	●	10-20	0.005 - 0.012	0.01 - 0.02	0.015-0.03	0.02-0.04	0.03-0.06	0.04-0.08	0.06-0.120
P02	●	10-20	0.005 - 0.012	0.01 - 0.02	0.015-0.03	0.02-0.04	0.03-0.06	0.04-0.08	0.06-0.120
P03	●	10-20	0.003 - 0.008	0.08-0.018	0.012-0.025	0.02-0.04	0.03-0.06	0.04-0.08	0.06-0.120
P04	◑	8-15	0.002 - 0.006	0.006-0.015	0.010-0.018	0.015-0.030	0.025-0.040	0.035-0.060	0.050-0.090
P05	◑	8-15	0.002 - 0.006	0.006-0.015	0.010-0.018	0.015-0.030	0.025-0.040	0.035-0.060	0.050-0.090
P06	◑	8-15	0.002 - 0.006	0.006-0.015	0.010-0.018	0.015-0.030	0.025-0.040	0.035-0.060	0.050-0.090
M01	◑	5-15	0.002 - 0.006	0.005-0.014	0.008-0.016	0.012-0.025	0.020-0.035	0.030-0.050	0.040-0.080
M02	◑	5-15	0.002 - 0.006	0.005-0.014	0.008-0.016	0.012-0.025	0.020-0.035	0.030-0.050	0.040-0.080
M03	◑	5-15	0.002 - 0.006	0.005-0.014	0.008-0.016	0.012-0.025	0.020-0.035	0.030-0.050	0.040-0.080
K01	◑	20-40	0.005 - 0.012	0.01 - 0.02	0.015-0.03	0.02-0.04	0.03-0.06	0.04-0.08	0.06-0.120
K03	◑	20-40	0.003 - 0.008	0.08-0.018	0.012-0.025	0.02-0.04	0.03-0.06	0.04-0.08	0.06-0.120
K02	◑	20-40	0.003 - 0.008	0.08-0.018	0.012-0.025	0.02-0.04	0.03-0.06	0.04-0.08	0.06-0.120
N01	●	30-50	0.01 - 0.02	0.015-0.040	0.03 - 0.06	0.04-0.08	0.060-0.100	0.080-0.140	0.100-0.200
N02	●	30-50	0.01 - 0.02	0.015-0.040	0.03 - 0.06	0.04-0.08	0.060-0.100	0.080-0.140	0.100-0.200
N03	●	30-50	0.008 - 0.018	0.010-0.030	0.020-0.050	0.035-0.070	0.060-0.100	0.080-0.140	0.100-0.200
N04	●	10-50	0.006-0.018	0.010-0.030	0.025-0.050	0.030-0.070	0.065-0.100	0.080-0.140	0.100-0.200
S01	○	-	-	-	-	-	-	-	-
S02	○	-	-	-	-	-	-	-	-
S03	○	-	-	-	-	-	-	-	-
S04	◑	8-15	0.002 - 0.006	0.006-0.015	0.010-0.018	0.015-0.030	0.025-0.040	0.035-0.060	0.050-0.090
H01	◑	8-15	0.01 - 0.02	0.015-0.040	0.03 - 0.06	0.04-0.08	0.060-0.100	0.080-0.140	0.100-0.200
H02	◑	8-15	0.01 - 0.02	0.015-0.040	0.03 - 0.06	0.04-0.08	0.060-0.100	0.080-0.140	0.100-0.200
H03	○	-	-	-	-	-	-	-	-
O01	●	30-50	0.01 - 0.02	0.015-0.040	0.03 - 0.06	0.04-0.08	0.060-0.100	0.080-0.140	0.100-0.200
O02	○	-	-	-	-	-	-	-	-
O03	○	-	-	-	-	-	-	-	-
O04	○	-	-	-	-	-	-	-	-
O05	○	-	-	-	-	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

TA35

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocità di taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 0.20-0.50	Ø 0.55-2.00
P00	●	20-40	0.002-0.008	0.01-0.02
P01	●	20-40	0.002-0.008	0.01-0.02
P02	●	20-40	0.002-0.008	0.01-0.02
P03	●	20-40	0.002-0.008	0.01-0.02
P04	◑	15-35	0.002-0.006	0.008-0.016
P05	◑	10-20	0.001-0.006	0.005-0.012
P06	◑	10-20	0.001-0.006	0.003-0.01
M01	◑	10-20	0.001-0.006	0.003-0.01
M02	◑	10-20	0.001-0.006	0.003-0.01
M03	◑	10-20	0.001-0.006	0.003-0.01
K01	◑	15-35	0.002-0.008	0.01-0.02
K03	◑	15-35	0.002-0.008	0.01-0.02
K02	◑	15-35	0.002-0.008	0.01-0.02
N01	●	80-120	0.005-0.010	0.020-0.040
N02	●	80-120	0.005-0.010	0.020-0.040
N03	●	60-100	0.005-0.010	0.020-0.040
N04	●	30-70	0.005-0.010	0.010-0.025
S01	○	-	-	-
S02	○	-	-	-
S03	○	-	-	-
S04	◑	10-20	0.001-0.006	0.003-0.01
H01	◑	10-20	0.001-0.006	0.003-0.01
H02	◑	10-20	0.001-0.006	0.003-0.01
H03	○	-	-	-
O01	●	80-120	0.005-0.010	0.020-0.040
O02	○	-	-	-
O03	○	-	-	-
O04	○	-	-	-
O05	○	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

MTB25

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocità di taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 0.50-4.00	Ø 4.10-8.00	Ø 8.10-12.00	Ø 12.50-16-00	Ø 18.00-20.00
P00	●	40-60	0.01-0.03	0.02-0.05	0.05-0.08	0.08-0.12	0.12-0.15
P01	●	40-60	0.01-0.03	0.02-0.05	0.05-0.08	0.08-0.12	0.12-0.15
P02	●	40-60	0.01-0.03	0.02-0.05	0.05-0.08	0.08-0.12	0.12-0.15
P03	●	30-50	0.01-0.02	0.02-0.03	0.03-0.06	0.06-0.08	0.08-0.10
P04	◑	20-40	0.01-0.02	0.02-0.03	0.03-0.06	0.06-0.08	0.08-0.10
P05	◑	15-30	0.01-0.02	0.02-0.04	0.04-0.08	0.06-0.10	0.10-0.12
P06	◑	15-30	0.01-0.02	0.02-0.04	0.04-0.08	0.06-0.10	0.10-0.12
M01	◑	15-30	0.01-0.02	0.02-0.04	0.04-0.08	0.06-0.10	0.10-0.12
M02	◑	15-30	0.01-0.02	0.02-0.04	0.04-0.08	0.06-0.10	0.10-0.12
M03	◑	15-30	0.01-0.02	0.02-0.04	0.04-0.08	0.06-0.10	0.10-0.12
K01	◑	30-50	0.04-0.06	0.04-0.06	0.06-0.09	0.09-0.14	0.14-0.18
K03	◑	30-50	0.04-0.06	0.04-0.06	0.06-0.09	0.09-0.14	0.14-0.18
K02	◑	30-50	0.04-0.06	0.04-0.06	0.06-0.09	0.09-0.14	0.14-0.18
N01	●	60-100	0.06-0.08	0.06-0.08	0.08-0.13	0.13-0.16	0.16-0.20
N02	●	60-100	0.06-0.08	0.06-0.08	0.08-0.13	0.13-0.16	0.16-0.20
N03	●	50-80	0.04-0.06	0.04-0.06	0.06-0.09	0.09-0.14	0.12-0.14
N04	●	30-70	0.06-0.08	0.06-0.08	0.08-0.13	0.13-0.16	0.16-0.20
S01	○	-	-	-	-	-	-
S02	○	-	-	-	-	-	-
S03	○	-	-	-	-	-	-
S04	○	-	-	-	-	-	-
H01	○	-	-	-	-	-	-
H02	○	-	-	-	-	-	-
H03	○	-	-	-	-	-	-
O01	●	60-100	0.06-0.08	0.06-0.08	0.08-0.13	0.13-0.16	0.16-0.20
O02	○	-	-	-	-	-	-
O03	○	-	-	-	-	-	-
O04	○	-	-	-	-	-	-
O05	○	-	-	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

MTB33

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocità di taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 1.00-4.00	Ø 4.50-8.00	Ø 8.50-12.00
P00	●	40-60	0.01-0.03	0.02-0.05	0.05-0.08
P01	●	40-60	0.01-0.03	0.02-0.05	0.05-0.08
P02	●	40-60	0.01-0.03	0.02-0.05	0.05-0.08
P03	◑	30-50	0.01-0.02	0.02-0.03	0.03-0.06
P04	○	-	-	-	-
P05	◑	15-30	0.003-0.01	0.02-0.04	0.04-0.08
P06	◑	15-30	0.003-0.01	0.02-0.04	0.04-0.08
M01	◑	15-30	0.003-0.01	0.02-0.04	0.04-0.08
M02	◑	15-30	0.003-0.01	0.02-0.04	0.04-0.08
M03	◑	15-30	0.003-0.01	0.02-0.04	0.04-0.08
K01	◑	30-50	0.01-0.02	0.04-0.06	0.06-0.09
K03	◑	30-50	0.01-0.02	0.04-0.06	0.06-0.09
K02	◑	30-50	0.01-0.02	0.04-0.06	0.06-0.09
N01	●	60-100	0.03-0.06	0.06-0.08	0.08-0.13
N02	●	60-100	0.03-0.06	0.06-0.08	0.08-0.13
N03	●	50-80	0.01-0.04	0.04-0.06	0.06-0.09
N04	●	30-70	0.03-0.06	0.06-0.08	0.08-0.13
S01	○	-	-	-	-
S02	○	-	-	-	-
S03	○	-	-	-	-
S04	◑	30-50	0.005-0.01	0.008-0.015	0.01-0.02
H01	○	-	-	-	-
H02	○	-	-	-	-
H03	○	-	-	-	-
O01	●	60-100	0.03-0.06	0.06-0.08	0.08-0.13
O02	○	-	-	-	-
O03	○	-	-	-	-
O04	○	-	-	-	-
O05	○	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

TA303B

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocità di taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 0.50-1.00	Ø 1.10-2.00	Ø 2.10-3.00
P00	●	40-70	0.010-0.016	0.015-0.023	0.020-0.030
P01	●	40-70	0.010-0.016	0.015-0.023	0.020-0.030
P02	●	40-70	0.010-0.016	0.015-0.023	0.020-0.030
P03	●	30-60	0.010-0.016	0.015-0.023	0.020-0.030
P04	◑	25-40	0.010-0.016	0.015-0.023	0.020-0.030
P05	●	25-40	0.010-0.016	0.015-0.023	0.020-0.030
P06	●	25-40	0.010-0.016	0.015-0.023	0.020-0.030
M01	●	25-40	0.010-0.016	0.015-0.023	0.020-0.030
M02	●	25-40	0.010-0.016	0.015-0.023	0.020-0.030
M03	●	25-40	0.010-0.016	0.015-0.023	0.020-0.030
K01	●	25-40	0.010-0.016	0.015-0.023	0.020-0.030
K03	●	25-40	0.010-0.016	0.015-0.023	0.020-0.030
K02	●	25-40	0.010-0.016	0.015-0.023	0.020-0.030
N01	●	80-150	0.015-0.023	0.020-0-038	0.035-0.050
N02	●	80-150	0.015-0.023	0.020-0-038	0.035-0.050
N03	●	80-150	0.015-0.023	0.020-0-038	0.035-0.050
N04	●	40-100	0.010-0.020	0.015-0.032	0.020-0.045
S01	○	-	-	-	-
S02	○	-	-	-	-
S03	○	-	-	-	-
S04	○	-	-	-	-
H01	○	-	-	-	-
H02	○	-	-	-	-
H03	○	-	-	-	-
O01	●	80-150	0.015-0.023	0.020-0-038	0.035-0.050
O02	○	-	-	-	-
O03	○	-	-	-	-
O04	○	-	-	-	-
O05	○	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

TC35

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocità di taglio m/min Cutting Speed m/min Ø 0.30-0.50	Ø 0.55-2.00	Avanzamento mm/giro Cutting Feed mm/rev Ø 0.30-0.50	Ø 0.55-0.80	Ø 0.85-1.20	Ø 1.25-2.00
P00	●	8-20	20-40	0.001-0.1	0.01-0.018	0.018-0.025	0.025-0.035
P01	●	8-20	20-40	0.001-0.1	0.01-0.018	0.018-0.025	0.025-0.035
P02	●	8-20	20-40	0.001-0.1	0.01-0.018	0.018-0.025	0.025-0.035
P03	●	6-18	18-38	0.001-0.008	0.008-0.016	0.016-0.023	0.023-0.033
P04	◑	5-14	14-30	0.001-0.007	0.007-0.015	0.015-0.02	0.02-0.03
P05	◑	5-14	14-30	0.001-0.008	0.008-0.016	0.016-0.023	0.023-0.033
P06	◑	5-14	14-30	0.001-0.008	0.008-0.016	0.016-0.023	0.023-0.033
M01	◑	3-12	12-25	0.001-0.005	0.005-0.01	0.01-0.016	0.016-0.02
M02	◑	3-12	12-25	0.001-0.005	0.005-0.01	0.01-0.016	0.016-0.02
M03	◑	3-12	12-25	0.001-0.005	0.005-0.01	0.01-0.016	0.016-0.02
K01	◑	8-20	20-40	0.001-0.01	0.01-0.018	0.018-0.025	0.025-0.035
K03	◑	6-18	6-18	0.001-0.008	0.008-0.016	0.016-0.023	0.023-0.033
K02	◑	6-18	6-18	0.001-0.008	0.008-0.016	0.016-0.023	0.023-0.033
N01	●	6-18	18-38	0.001-0.007	0.007-0.015	0.015-0.02	0.02-0.03
N02	●	10-25	25-55	0.001-0.010	0.01-0.018	0.018-0.025	0.025-0.035
N03	●	8-22	22-50	0.001-0.08	0.008-0.016	0.016-0.023	0.023-0.033
N04	●	5-25	15-55	0.001-0.01	0.005-0.018	0.010-0.025	0.016-0.035
S01	◑	15-30	15-30	0.001-0.005	0.001-0.005	0.003-0.007	0.003-0.007
S02	◑	30-50	30-50	0.001-0.005	0.001-0.005	0.003-0.007	0.003-0.007
S03	◑	30-50	30-50	0.001-0.005	0.001-0.005	0.003-0.007	0.003-0.007
S04	◑	6-10	10-20	0.001-0.005	0.005-0.01	0.01-0.016	0.016-0.02
H01	○	-	-	-	-	-	-
H02	○	-	-	-	-	-	-
H03	○	-	-	-	-	-	-
O01	●	15-30	15-30	0.005-0.015	0.015-0.03	0.03-0.045	0.045-0.06
O02	○	-	-	-	-	-	-
O03	○	-	-	-	-	-	-
O04	○	-	-	-	-	-	-
O05	○	-	-	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

Made in Switzerland

MTB30

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocitàdi taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 0.80 - 0.90	Ø 1.00-4.00	Ø 4.10-8.50	Ø 9.00-16.00
P00	●	40-60	0.01-0.02	0.01-0.03	0.02-0.05	0.05-0.08
P01	●	40-60	0.01-0.02	0.01-0.03	0.02-0.05	0.05-0.08
P02	●	40-60	0.01-0.02	0.01-0.03	0.02-0.05	0.05-0.08
P03	●	30-50	0.007-0.015	0.01-0.02	0.02-0.03	0.03-0.04
P04	◑	20-40	0.006-0.013	0.008-0.017	0.015-0.025	0.02-0.03
P05	◑	15-30	0.003-0.01	0.005-0.015	0.01-0.02	0.015-0.025
P06	◑	15-30	0.003-0.01	0.005-0.015	0.01-0.02	0.015-0.025
M01	◑	15-30	0.003-0.01	0.005-0.015	0.01-0.02	0.015-0.025
M02	◑	15-30	0.003-0.01	0.005-0.015	0.01-0.02	0.015-0.025
M03	◑	15-30	0.003-0.01	0.005-0.015	0.01-0.02	0.015-0.025
K01	◑	30-50	0.01-0.02	0.01-0.03	0.02-0.05	0.05-0.08
K03	◑	30-50	0.01-0.02	0.01-0.03	0.02-0.05	0.05-0.08
K02	◑	30-50	0.01-0.02	0.01-0.03	0.02-0.05	0.05-0.08
N01	●	60-100	0.01-0.04	0.04-0.07	0.04-0.07	0.06-0.08
N02	●	60-100	0.01-0.04	0.04-0.07	0.04-0.07	0.06-0.08
N03	●	50-80	0.005-0.02	0.02-0.05	0.02-0.05	0.04-0.06
N04	●	30-70	0.01-0.04	0.04-0.07	0.04-0.07	0.06-0.08
S01	○	-	-	-	-	-
S02	○	-	-	-	-	-
S03	○	-	-	-	-	-
S04	○	-	-	-	-	-
H01	○	-	-	-	-	-
H02	○	-	-	-	-	-
H03	○	-	-	-	-	-
O01	●	60-100	0.01-0.04	0.04-0.07	0.04-0.07	0.06-0.08
O02	○	-	-	-	-	-
O03	○	-	-	-	-	-
O04	○	-	-	-	-	-
O05	○	-	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

MTB35

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocitàdi taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 0,30-1,00	Ø 1,05-4,00	Ø 4,10-6,00
P00	●	40-60	0.005-0.01	0.01-0.03	0.015-0.05
P01	●	40-60	0.005-0.01	0.01-0.03	0.015-0.05
P02	●	40-60	0.005-0.01	0.01-0.03	0.015-0.05
P03	◑	30-50	0.005-0.01	0.01-0.02	0.015-0.03
P04	○	-	-	-	-
P05	◑	15-30	0.003-0.008	0.003-0.01	0.015-0.04
P06	◑	15-30	0.003-0.008	0.003-0.01	0.015-0.04
M01	◑	15-30	0.003-0.008	0.003-0.01	0.015-0.04
M02	◑	15-30	0.003-0.008	0.003-0.01	0.015-0.04
M03	◑	15-30	0.003-0.008	0.003-0.01	0.015-0.04
K01	◑	30-50	0.005-0.01	0.01-0.02	0.03-0.05
K03	◑	30-50	0.005-0.01	0.01-0.02	0.03-0.05
K02	◑	30-50	0.005-0.01	0.01-0.02	0.03-0.05
N01	●	60-100	0.005-0.015	0.015-0.040	0.03-0.05
N02	●	60-100	0.005-0.015	0.015-0.040	0.03-0.05
N03	●	50-80	0.005-0.015	0.01-0.03	0.02-0.04
N04	●	30-70	0.005-0.015	0.01-0.03	0.04-0.06
S01	○	-	-	-	-
S02	○	-	-	-	-
S03	○	-	-	-	-
S04	◑	30-50	0.002-0.007	0.005-0.01	0.008-0.015
H01	○	-	-	-	-
H02	○	-	-	-	-
H03	○	-	-	-	-
O01	●	60-100	0.005-0.015	0.015-0.040	0.03-0.05
O02	○	-	-	-	-
O03	○	-	-	-	-
O04	○	-	-	-	-
O05	○	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

Made in Switzerland

MTB35L

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocità di taglio m/min Cutting Speed m/min Ø 0,50-1,95	Ø 2,00-3,90	Ø 4,00-6,00	Avanzamento mm/giro Cutting Feed mm/rev Ø 0,50-1,95	Ø 2,00-3,90	Ø 4,00-6,00
P00	●	30-50	40-60	50-70	0.01 - 0.02	0.020-0.035	0.040-0.060
P01	●	30-50	40-60	50-70	0.01 - 0.02	0.020-0.035	0.040-0.060
P02	●	30-50	40-60	50-70	0.01 - 0.02	0.020-0.035	0.040-0.060
P03	●	30-50	40-60	50-70	0.01 - 0.02	0.020-0.035	0.040-0.060
P04	◑	30-50	40-60	50-70	0.01 - 0.02	0.020-0.035	0.040-0.060
P05	◑	20-40	30-50	30-50	0.005-0.012	0.020-0.040	0.035-0.050
P06	◑	15-30	25-45	25-45	0.003 - 0.01	0.016-0.035	0.028-0.042
M01	◑	15-30	25-45	25-45	0.003 - 0.01	0.016-0.035	0.028-0.042
M02	◑	15-30	25-45	25-45	0.003 - 0.01	0.016-0.035	0.028-0.042
M03	◑	15-30	25-45	25-45	0.003 - 0.01	0.016-0.035	0.028-0.042
K01	◑	30-60	30-60	50-70	0.01 - 0.02	0.020-0.035	0.040-0.060
K03	◑	30-60	30-60	50-70	0.01 - 0.02	0.020-0.035	0.040-0.060
K02	◑	30-60	30-60	50-70	0.01 - 0.02	0.020-0.035	0.040-0.060
N01	●	40-60	40-60	60-100	0.020-0.040	0.030-0.050	0.040-0.070
N02	●	40-60	40-60	60-100	0.020-0.040	0.030-0.050	0.040-0.070
N03	●	40-60	40-60	60-100	0.020-0.040	0.030-0.050	0.040-0.070
N04	●	15-60	15-60	30-100	0.010-0.025	0.020-0.050	0.030-0.065
S01	○	-	-	-	-	-	-
S02	○	-	-	-	-	-	-
S03	○	-	-	-	-	-	-
S04	◑	10-20	10-20	25-45	0.003 - 0.008	0.006-0.015	0.016-0.035
H01	◑	10-20	10-20	25-45	0.003 - 0.008	0.006-0.015	0.016-0.035
H02	◑	10-20	10-20	25-45	0.003 - 0.008	0.006-0.015	0.016-0.035
H03	○	-	-	-	-	-	-
O01	●	40-60	40-60	60-100	0.020-0.040	0.030-0.050	0.040-0.070
O02	○	-	-	-	-	-	-
O03	○	-	-	-	-	-	-
O04	○	-	-	-	-	-	-
O05	○	-	-	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

MTB45

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocità di taglio m/min Cutting Speed m/min			Avanzamento mm/giro Cutting Feed mm/rev							
		Ø 0.30-2.00	Ø 2.10-6.00	Ø 6.10-13.00	Ø 0.30-0.50	Ø 0.60-2.00	Ø 2.10-3.00	Ø 3.10-4.00	Ø 4.10-6.00	Ø 6.10-8.00	Ø 8.50-10.00	Ø 10.50-13.00
P00	●	20-40	30-50	40-60	0.002-0.008	0.01-0.02	0.020-0.035	0.030-0.050	0.040-0.060	0.060-0.100	0.080-0.120	0.120-0.200
P01	●	20-40	30-50	40-60	0.002-0.008	0.01-0.02	0.020-0.035	0.030-0.050	0.040-0.060	0.060-0.100	0.080-0.120	0.120-0.200
P02	●	20-40	30-50	40-60	0.002-0.008	0.01-0.02	0.020-0.035	0.030-0.050	0.040-0.060	0.060-0.100	0.080-0.120	0.120-0.200
P03	●	20-40	30-50	40-60	0.002-0.008	0.01-0.02	0.020-0.035	0.030-0.050	0.040-0.060	0.060-0.100	0.080-0.120	0.120-0.200
P04	◑	10-20	15-30	15-30	0.001-0.006	0.005-0.012	0.020-0.040	0.020-0.040	0.035-0.050	0.040-0.065	0.070-0.100	0.100-0.140
P05	◑	10-20	15-30	15-30	0.001-0.006	0.005-0.012	0.020-0.040	0.020-0.040	0.035-0.050	0.040-0.065	0.070-0.100	0.100-0.140
P06	◑	10-20	15-30	15-30	0.001-0.006	0.003-0.01	0.016-0.035	0.016-0.035	0.028-0.042	0.035-0.050	0.060-0.080	0.080-0.120
M01	◑	10-20	15-30	15-30	0.001-0.006	0.003-0.01	0.016-0.035	0.016-0.035	0.028-0.042	0.035-0.050	0.060-0.080	0.080-0.120
M02	◑	10-20	15-30	15-30	0.001-0.006	0.003-0.01	0.016-0.035	0.016-0.035	0.028-0.042	0.035-0.050	0.060-0.080	0.080-0.120
M03	◑	10-20	15-30	15-30	0.001-0.006	0.003-0.01	0.016-0.035	0.016-0.035	0.028-0.042	0.035-0.050	0.060-0.080	0.080-0.120
K01	◑	15-35	30-60	30-60	0.002-0.008	0.01-0.02	0.020-0.035	0.030-0.050	0.040-0.060	0.060-0.100	0.080-0.120	0.120-0.200
K03	◑	15-35	20-50	20-50	0.002-0.008	0.01-0.02	0.020-0.035	0.030-0.050	0.040-0.060	0.060-0.100	0.080-0.120	0.120-0.200
K02	◑	15-35	20-50	20-50	0.002-0.008	0.01-0.02	0.020-0.035	0.030-0.050	0.040-0.060	0.060-0.100	0.080-0.120	0.120-0.200
N01	●	80-120	90-140	90-140	0.005-0.010	0.020-0.040	0.030-0.050	0.030-0.050	0.040-0.070	0.070-0.110	0.070-0.110	0.130-0.200
N02	●	80-120	90-140	90-140	0.005-0.010	0.020-0.040	0.030-0.050	0.030-0.050	0.040-0.070	0.070-0.110	0.070-0.110	0.130-0.200
N03	●	60-100	80-120	80-120	0.005-0.010	0.020-0.040	0.030-0.050	0.030-0.050	0.040-0.070	0.070-0.110	0.070-0.110	0.130-0.200
N04	●	30-70	50-100	50-100	0.005-0.010	0.010-0.025	0.020-0.050	0.020-0.050	0.030-0.065	0.040-0.110	0.040-0.110	0.075-0.150
S01	○	-	-	-	-	-	-	-	-	-	-	-
S02	○	-	-	-	-	-	-	-	-	-	-	-
S03	○	-	-	-	-	-	-	-	-	-	-	-
S04	◑	10-20	15-30	15-30	0.001-0.006	0.005-0.012	0.020-0.040	0.020-0.040	0.035-0.050	0.040-0.065	0.070-0.100	0.100-0.140
H01	◑	10-20	15-30	15-30	0.001-0.006	0.005-0.012	0.020-0.040	0.020-0.040	0.035-0.050	0.040-0.065	0.070-0.100	0.100-0.140
H02	◑	10-20	15-30	15-30	0.001-0.006	0.005-0.012	0.020-0.040	0.020-0.040	0.035-0.050	0.040-0.065	0.070-0.100	0.100-0.140
H03	○	-	-	-	-	-	-	-	-	-	-	-
O01	●	80-120	90-140	90-140	0.005-0.010	0.020-0.040	0.030-0.050	0.030-0.050	0.040-0.070	0.070-0.110	0.070-0.110	0.130-0.200
O02	○	-	-	-	-	-	-	-	-	-	-	-
O03	○	-	-	-	-	-	-	-	-	-	-	-
O04	○	-	-	-	-	-	-	-	-	-	-	-
O05	○	-	-	-	-	-	-	-	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

MTB50

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocità di taglio m/min Cutting Speed m/min			Avanzamento mm/giro Cutting Feed mm/rev							
		Ø 1.00-2.00	Ø 2.10-6.00	Ø 6.50-13.00	Ø 1.00-2.00	Ø 2,10-4,00	Ø 4.10-6.00	Ø 6.50-8.00	Ø 8.50-10.00	Ø 10.50-13.00		
P00	●	20-40	30-50	40-60	0.01-0.02	0.020-0.035	0.040-0.060	0.060-0.100	0.080-0.120	0.120-0.200		
P01	●	20-40	30-50	40-60	0.01-0.02	0.020-0.035	0.040-0.060	0.060-0.100	0.080-0.120	0.120-0.200		
P02	●	20-40	30-50	40-60	0.01-0.02	0.020-0.035	0.040-0.060	0.060-0.100	0.080-0.120	0.120-0.200		
P03	●	20-40	30-50	40-60	0.01-0.02	0.020-0.035	0.040-0.060	0.060-0.100	0.080-0.120	0.120-0.200		
P04	◑	10-20	15-30	15-30	0.005-0.012	0.020-0.040	0.020-0.040	0.035-0.050	0.040-0.065	0.070-0.100		
P05	◑	10-20	15-30	15-30	0.005-0.012	0.020-0.040	0.035-0.050	0.040-0.065	0.070-0.100	0.100-0.140		
P06	◑	10-20	15-30	15-30	0.003-0.01	0.016-0.035	0.028-0.042	0.035-0.050	0.060-0.080	0.080-0.120		
M01	◑	10-20	15-30	15-30	0.003-0.01	0.016-0.035	0.028-0.042	0.035-0.050	0.060-0.080	0.080-0.120		
M02	◑	10-20	15-30	15-30	0.003-0.01	0.016-0.035	0.028-0.042	0.035-0.050	0.060-0.080	0.080-0.120		
M03	◑	10-20	15-30	15-30	0.003-0.01	0.016-0.035	0.028-0.042	0.035-0.050	0.060-0.080	0.080-0.120		
K01	◑	15-35	30-60	30-60	0.01-0.02	0.020-0.035	0.040-0.060	0.060-0.100	0.080-0.120	0.120-0.200		
K03	◑	15-35	20-50	20-50	0.01-0.02	0.020-0.035	0.040-0.060	0.060-0.100	0.080-0.120	0.120-0.200		
K02	◑	15-35	20-50	20-50	0.01-0.02	0.020-0.035	0.040-0.060	0.060-0.100	0.080-0.120	0.120-0.200		
N01	●	80-120	90-140	90-140	0.020-0.040	0.030-0.050	0.040-0.070	0.070-0.110	0.070-0.110	0.130-0.200		
N02	●	80-120	90-140	90-140	0.020-0.040	0.030-0.050	0.040-0.070	0.070-0.110	0.070-0.110	0.130-0.200		
N03	●	60-100	80-120	80-120	0.020-0.040	0.030-0.050	0.040-0.070	0.070-0.110	0.070-0.110	0.130-0.200		
N04	●	30-70	50-100	50-100	0.010-0.025	0.020-0.050	0.030-0.065	0.040-0.110	0.040-0.110	0.075-0.150		
S01	○	-	-	-	-	-	-	-	-	-		
S02	○	-	-	-	-	-	-	-	-	-		
S03	○	-	-	-	-	-	-	-	-	-		
S04	◑	10-20	15-30	15-30	0.005-0.012	0.020-0.040	0.035-0.050	0.040-0.065	0.070-0.100	0.100-0.140		
H01	◑	10-20	15-30	15-30	0.005-0.012	0.020-0.040	0.035-0.050	0.040-0.065	0.070-0.100	0.100-0.140		
H02	◑	10-20	15-30	15-30	0.005-0.012	0.020-0.040	0.035-0.050	0.040-0.065	0.070-0.100	0.100-0.140		
H03	○	-	-	-	-	-	-	-	-	-		
O01	●	80-120	90-140	90-140	0.020-0.040	0.030-0.050	0.040-0.070	0.070-0.110	0.070-0.110	0.130-0.200		
O02	○	-	-	-	-	-	-	-	-	-		
O03	○	-	-	-	-	-	-	-	-	-		
O04	○	-	-	-	-	-	-	-	-	-		
O05	○	-	-	-	-	-	-	-	-	-		

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

MTB60

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocità di taglio m/min Cutting Speed m/min Ø 1.00-2.00	Ø 2.00-6.00	Ø 6.50-10.00	Avanzamento mm/giro Cutting Feed mm/rev Ø 1.00-2.00	Ø 2.10-2.90	Ø 3.00-4.00	Ø 4.10-6.00	Ø 6.50-8.00	Ø 8.50-10.00
P00	●	15-35	25-45	35-55	0.01-0.02	0.020-0.035	0.030-0.050	0.040-0.060	0.060-0.100	0.080-0.120
P01	●	15-35	25-45	35-55	0.01-0.02	0.020-0.035	0.030-0.050	0.040-0.060	0.060-0.100	0.080-0.120
P02	●	15-35	25-45	35-55	0.01-0.02	0.020-0.035	0.030-0.050	0.040-0.060	0.060-0.100	0.080-0.120
P03	●	15-35	25-45	35-55	0.01-0.02	0.020-0.035	0.030-0.050	0.040-0.060	0.060-0.100	0.080-0.120
P04	◑	10-20	15-30	15-30	0.005-0.012	0.020-0.040	0.020-0.040	0.035-0.050	0.040-0.065	0.070-0.100
P05	◑	10-20	15-30	15-30	0.005-0.012	0.020-0.040	0.020-0.040	0.035-0.050	0.040-0.065	0.070-0.100
P06	◑	10-20	15-30	15-30	0.003-0.01	0.016-0.035	0.016-0.035	0.028-0.042	0.035-0.050	0.060-0.080
M01	◑	10-20	15-30	15-30	0.003-0.01	0.016-0.035	0.016-0.035	0.028-0.042	0.035-0.050	0.060-0.080
M02	◑	10-20	15-30	15-30	0.003-0.01	0.016-0.035	0.016-0.035	0.028-0.042	0.035-0.050	0.060-0.080
M03	◑	10-20	15-30	15-30	0.003-0.01	0.016-0.035	0.016-0.035	0.028-0.042	0.035-0.050	0.060-0.080
K01	◑	15-35	25-45	35-55	0.01-0.02	0.020-0.035	0.030-0.050	0.040-0.060	0.060-0.100	0.080-0.120
K03	◑	15-35	25-45	35-55	0.01-0.02	0.020-0.035	0.030-0.050	0.040-0.060	0.060-0.100	0.080-0.120
K02	◑	15-35	25-45	35-55	0.01-0.02	0.020-0.035	0.030-0.050	0.040-0.060	0.060-0.100	0.080-0.120
N01	●	80-120	90-140	90-140	0.020-0.040	0.030-0.050	0.030-0.050	0.040-0.070	0.070-0.110	0.070-0.110
N02	●	80-120	90-140	90-140	0.020-0.040	0.030-0.050	0.030-0.050	0.040-0.070	0.070-0.110	0.070-0.110
N03	●	60-100	80-120	80-120	0.020-0.040	0.030-0.050	0.030-0.050	0.040-0.070	0.070-0.110	0.070-0.110
N04	●	30-70	30-70	30-70	0.010-0.025	0.020-0.050	0.020-0.050	0.030-0.065	0.040-0.110	0.040-0.110
S01	○	-	-	-	-	-	-	-	-	-
S02	○	-	-	-	-	-	-	-	-	-
S03	○	-	-	-	-	-	-	-	-	-
S04	◑	10-20	15-30	15-30	0.005-0.012	0.020-0.040	0.020-0.040	0.035-0.050	0.040-0.065	0.070-0.100
H01	◑	10-20	15-30	15-30	0.005-0.012	0.020-0.040	0.020-0.040	0.035-0.050	0.040-0.065	0.070-0.100
H02	◑	10-20	15-30	15-30	0.005-0.012	0.020-0.040	0.020-0.040	0.035-0.050	0.040-0.065	0.070-0.100
H03	○	-	-	-	-	-	-	-	-	-
O01	●	80-120	90-140	90-140	0.020-0.040	0.030-0.050	0.030-0.050	0.040-0.070	0.070-0.110	0.070-0.110
O02	○	-	-	-	-	-	-	-	-	-
O03	○	-	-	-	-	-	-	-	-	-
O04	○	-	-	-	-	-	-	-	-	-
O05	○	-	-	-	-	-	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

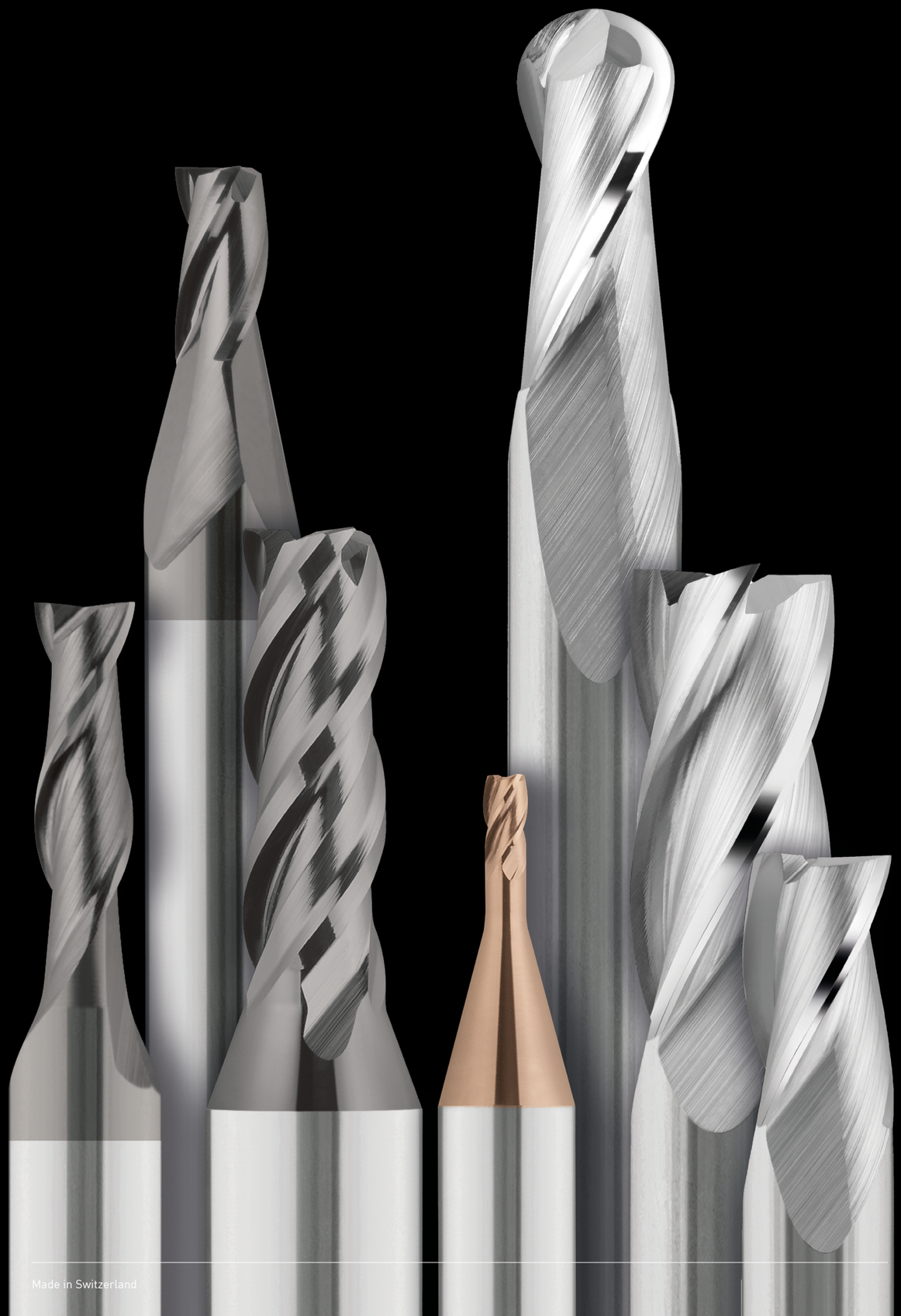
MS402

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocità di taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 1.00-4.00	Ø 4.50-6.00	Ø 6.50-7.50	Ø 8.00-9.00	Ø 9.50-10.50	Ø 11.00-12.00	Ø 12.50-13.50	Ø 14.00-15.00	Ø 15.50	Ø 16.00
P00	●	15-30	0.085-0.098	0.094-0.114	0.122-0.142	0.153-0.176	0.188-0.213	0.1-0.114	0.122-0.142	0.153-0.176	0.336	0.336
P01	●	15-30	0.085-0.098	0.094-0.114	0.122-0.142	0.153-0.176	0.188-0.213	0.1-0.114	0.122-0.142	0.153-0.176	0.336	0.336
P02	●	15-30	0.085-0.098	0.094-0.114	0.122-0.142	0.153-0.176	0.188-0.213	0.1-0.114	0.122-0.142	0.153-0.176	0.336	0.336
P03	●	10-20	0.077-0.089	0.086-0.104	0.111-0.129	0.139-0.160	0.171-0.194	0.091-0.104	0.111-0.129	0.139-0.160	0.306	0.306
P04	◑	10-15	0.061-0.071	0.069-0.083	0.089-0.103	0.111-0.128	0.137-0.155	0.073-0.083	0.089-0.103	0.111-0.128	0.245	0.245
P05	◑	5-15	0.058-0.067	0.068-0.078	0.083-0.097	0.104-0.120	0.128-0.145	0.068-0.078	0.083-0.097	0.104-0.120	0.229	0.229
P06	◑	5-15	0.058-0.067	0.068-0.078	0.083-0.097	0.104-0.120	0.128-0.145	0.068-0.078	0.083-0.097	0.104-0.120	0.229	0.229
M01	◑	5-10	0.058-0.067	0.068-0.078	0.083-0.097	0.104-0.120	0.128-0.145	0.068-0.078	0.083-0.097	0.104-0.120	0.229	0.229
M02	◑	5-10	0.058-0.067	0.068-0.078	0.083-0.097	0.104-0.120	0.128-0.145	0.068-0.078	0.083-0.097	0.104-0.120	0.229	0.229
M03	◑	5-10	0.058-0.067	0.068-0.078	0.083-0.097	0.104-0.120	0.128-0.145	0.068-0.078	0.083-0.097	0.104-0.120	0.229	0.229
K01	◑	10-20	0.077-0.089	0.086-0.104	0.111-0.129	0.139-0.160	0.171-0.194	0.091-0.104	0.111-0.129	0.139-0.160	0.306	0.229
K03	◑	10-20	0.077-0.089	0.086-0.104	0.111-0.129	0.139-0.160	0.171-0.194	0.091-0.104	0.111-0.129	0.139-0.160	0.306	0.229
K02	◑	10-20	0.077-0.089	0.086-0.104	0.111-0.129	0.139-0.160	0.171-0.194	0.091-0.104	0.111-0.129	0.139-0.160	0.306	0.229
N01	◑	40-60	0.115-0.134	0.129-0.155	0.167-0.193	0.208-0.239	0.256-0.291	0.136-0.155	0.167-0.193	0.208-0.239	0.459	0.459
N02	◑	40-60	0.115-0.134	0.129-0.155	0.167-0.193	0.208-0.239	0.256-0.291	0.136-0.155	0.167-0.193	0.208-0.239	0.459	0.459
N03	◑	40-60	0.115-0.134	0.129-0.155	0.167-0.193	0.208-0.239	0.256-0.291	0.136-0.155	0.167-0.193	0.208-0.239	0.459	0.459
N04	◑	40-60	0.115-0.134	0.129-0.155	0.167-0.193	0.208-0.239	0.256-0.291	0.136-0.155	0.167-0.193	0.208-0.239	0.459	0.459
S01	◑	5-10	0.046-0.053	0.051-0.062	0.067-0.077	0.083-0.096	0.102-0.116	0.054-0.062	0.067-0.077	0.083-0.096	0.183	0.183
S02	◑	5-10	0.046-0.053	0.051-0.062	0.067-0.077	0.083-0.096	0.102-0.116	0.054-0.062	0.067-0.077	0.083-0.096	0.183	0.183
S03	◑	5-10	0.046-0.053	0.051-0.062	0.067-0.077	0.083-0.096	0.102-0.116	0.054-0.062	0.067-0.077	0.083-0.096	0.183	0.183
S04	◑	5-10	0.058-0.067	0.064-0.078	0.083-0.097	0.104-0.12	0.128-0.145	0.068-0.078	0.083-0.097	0.104-0.12	0.229	0.229
H01	◑	5-10	0.032-0.050	0.053-0.061	0.064-0.070	0.073-0.079	0.082-0.088	0.055-0.061	0.064-0.070	0.073-0.079	0.117	0.120
H02	◑	4-8	0.02-0.036	0.039-0.047	0.049-0.055	0.057-0.063	0.065-0.071	0.041-0.047	0.049-0.055	0.057-0.063	0.097	0.100
H03	○	-	-	-	-	-	-	-	-	-	-	-
O01	◑	50-70	0.115-0.135	0.123-0.145	0.155-0.18	0.193-0.223	0.239-0.273	0.129-0.145	0.155-0.18	0.193-0.223	0.444	0.459
O02	○	-	-	-	-	-	-	-	-	-	-	-
O03	○	-	-	-	-	-	-	-	-	-	-	-
O04	○	-	-	-	-	-	-	-	-	-	-	-
O05	○	-	-	-	-	-	-	-	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé



FRESATURA
MILLING
FRÄSBEARBEITUNG
FRAISAGE

FRESE AD ALTO RENDIMENTO
HIGH-PERFORMANCE CUTTERS

TTM225E	**122**
TTM225T	**122**
TTM250E	**123**
TTM250T	**123**
TMR230E	**124**
TMR250E	**125**
MS320	**126**
MS330	**127**
TTM325E	**128**
TTM325T	**128**
TTM350E	**129**
TTM350T	**129**
TWF3	**130**
TWF5	**131**

FRESE
CUTTERS

MS122	**140**
MS122XL	**141**
MS122XLS	**141**
MS123	**142**
MS123XL	**143**
MS123XLS	**143**
MS124	**144**
MS131	**146**
MS131XL	**147**
MS131XLS	**147**
MS141	**148**
MS141XL	**149**
MS141XLS	**149**

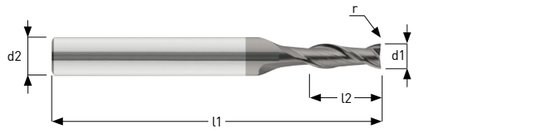
TTM225E
TTM225T

Microfresa
Micro-milling cutter

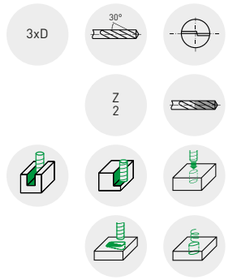
Microfresa torica
Corner radius micro-milling cutter

Mikrofräser
Micro fraise

Eckradius Mikrofräser
Micro fraise toriques







P M K N S H O

45°

Art. Tusa Precision	d1 +/-0.01	d2 h6	l1 +/-0.2	l2 0/+0.5
TTM2250100E	1,00	4,00	40	3,00
TTM2250120E	1,20	4,00	40	3,60
TTM2250150E	1,50	4,00	40	4,50
TTM2250158E	1,58	4,00	40	4,70
TTM2250180E	1,80	4,00	40	5,40
TTM2250200E	2,00	4,00	40	6,00
TTM2250238E	2,38	4,00	40	7,15
TTM2250250E	2,50	4,00	50	7,50
TTM2250300E	3,00	6,00	50	9,00
TTM2250317E	3,17	6,00	50	9,50
TTM2250350E	3,50	6,00	50	10,50
TTM2250397E	3,97	6,00	50	12,00
TTM2250400E	4,00	6,00	50	12,00
TTM2250450E	4,50	6,00	50	13,50
TTM2250476E	4,76	6,00	50	14,30
TTM2250500E	5,00	6,00	50	15,00
TTM2250556E	5,56	6,00	50	16,70
TTM2250600E	6,00	6,00	50	18,00

Cr

Art. Tusa Precision	d1 +/-0.01	d2 h6	l1 +/-0.2	l2 0/+0.5	r 0/-0.02
TTM2250100T01	1,00	4,00	40	3,00	0,10
TTM2250100T02	1,00	4,00	40	3,00	0,20
TTM2250120T01	1,20	4,00	40	3,60	0,10
TTM2250120T02	1,20	4,00	40	3,60	0,20
TTM2250150T01	1,50	4,00	40	4,50	0,10
TTM2250150T03	1,50	4,00	40	4,50	0,30
TTM2250180T01	1,80	4,00	40	5,40	0,10
TTM2250180T03	1,80	4,00	40	5,40	0,30
TTM2250200T01	2,00	4,00	40	6,00	0,10
TTM2250200T05	2,00	4,00	40	6,00	0,50
TTM2250250T02	2,50	6,00	50	7,50	0,20
TTM2250250T05	2,50	6,00	50	7,50	0,50
TTM2250300T02	3,00	6,00	50	9,00	0,20
TTM2250300T05	3,00	6,00	50	9,00	0,50
TTM2250400T02	4,00	6,00	50	12,00	0,20
TTM2250400T05	4,00	6,00	50	12,00	0,50
TTM2250600T05	6,00	6,00	50	18,00	0,50
TTM2250600T10	6,00	6,00	50	18,00	1,00

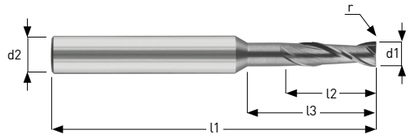
TTM250E
TTM250T

Microfresa
Micro-milling cutter

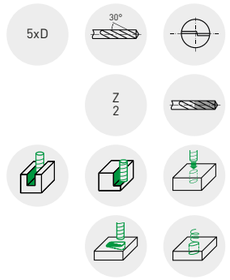
Microfresa torica
Corner radius micro-milling cutter

Mikrofräser
Micro fraise

Eckradius Mikrofräser
Micro fraise toriques







P M K N S H O

45°

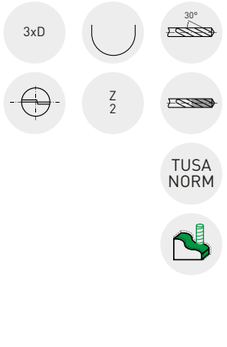
Art. Tusa Precision	d1 +/-0.01	d2 h6	l1 +/-0.2	l2 0/+0.5	l3 -0/+1
TTM2500100E	1,00	4,00	40	3,00	5,00
TTM2500120E	1,20	4,00	40	3,60	6,00
TTM2500150E	1,50	4,00	40	4,50	7,50
TTM2500158E	1,58	4,00	40	4,70	8,00
TTM2500180E	1,80	4,00	40	5,40	9,00
TTM2500200E	2,00	4,00	40	6,00	10,00
TTM2500238E	2,38	4,00	40	7,15	12,00
TTM2500250E	2,50	6,00	50	7,50	12,50
TTM2500300E	3,00	6,00	50	9,00	15,00
TTM2500317E	3,17	6,00	50	9,50	16,00
TTM2500350E	3,50	6,00	50	10,50	18,00
TTM2500397E	3,97	6,00	50	12,00	20,00
TTM2500400E	4,00	6,00	50	12,00	20,00
TTM2500450E	4,50	6,00	50	13,50	23,00
TTM2500476E	4,76	6,00	50	14,30	24,00
TTM2500500E	5,00	6,00	50	15,00	25,00
TTM2500556E	5,56	6,00	50	16,70	28,00
TTM2500600E	6,00	6,00	50	18,00	30,00

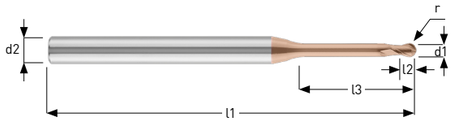
Cr

Art. Tusa Precision	d1 +/-0.01	d2 h6	l1 +/-0.2	l2 0/+0.5	l3 -0/+1	r 0/-0.02
TTM2500100T01	1,00	4,00	40	3,00	5,00	0,10
TTM2500100T02	1,00	4,00	40	3,00	5,00	0,20
TTM2500120T01	1,20	4,00	40	3,60	6,00	0,10
TTM2500120T02	1,20	4,00	40	3,60	6,00	0,20
TTM2500150T01	1,50	4,00	40	4,50	7,50	0,10
TTM2500150T03	1,50	4,00	40	4,50	7,50	0,30
TTM2500180T01	1,80	4,00	40	5,40	9,00	0,10
TTM2500180T03	1,80	4,00	40	5,40	9,00	0,30
TTM2500200T01	2,00	4,00	40	6,00	10,00	0,10
TTM2500200T05	2,00	4,00	40	6,00	10,00	0,50
TTM2500250T02	2,50	6,00	50	7,50	12,50	0,20
TTM2500250T05	2,50	6,00	50	7,50	12,50	0,50
TTM2500300T02	3,00	6,00	50	9,00	15,00	0,20
TTM2500300T05	3,00	6,00	50	9,00	15,00	0,50
TTM2500400T02	4,00	6,00	50	12,00	20,00	0,20
TTM2500400T05	4,00	6,00	50	12,00	20,00	0,50
TTM2500600T05	6,00	6,00	50	18,00	30,00	0,50
TTM2500600T10	6,00	6,00	50	18,00	30,00	1,00

TMR230E

Fresa semisferica
Ball nose end mill
Kugelfräser
Fraise hémisphérique





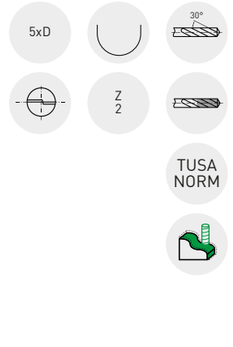


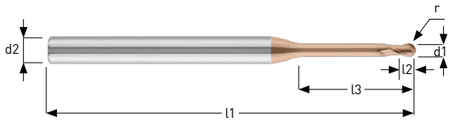
P M K N S H O

Art. Tusa Precision	d1 0/-0.02	d2 h6	l1 +/-0.2	l2 0/+0.5	l3 -0/+1	r 0/-0.02
TMR2300050E	0,50	4,00	50	0,35	2,00	0,25
TMR2300060E	0,60	4,00	50	0,40	3,00	0,30
TMR2300080E	0,80	4,00	50	0,50	3,00	0,40
TMR2300100E	1,00	4,00	50	0,80	4,00	0,50
TMR2300120E	1,20	4,00	50	1,00	4,00	0,60
TMR2300150E	1,50	4,00	50	1,35	5,00	0,75
TMR2300200E	2,00	4,00	50	1,70	6,00	1,00
TMR2300250E	2,50	4,00	60	2,10	8,00	1,25
TMR2300300E	3,00	6,00	57	3,00	10,00	1,50
TMR2300400E	4,00	6,00	57	4,00	15,00	2,00
TMR2300500E	5,00	6,00	57	5,00	15,00	2,50
TMR2300600E	6,00	6,00	57	6,00	20,00	3,00

TMR250E

Fresa semisferica
Ball nose end mill
Kugelfräser
Fraise hémisphérique







P M K N S H O

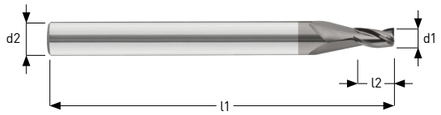
Art. Tusa Precision	d1 0/-0.02	d2 h6	l1 +/-0.2	l2 0/+0.5	l3 -0/+1	r 0/-0.02
TMR2500050E	0,50	4,00	50	0,35	3,00	0,25
TMR2500060E	0,60	4,00	50	0,40	4,00	0,30
TMR2500080E	0,80	4,00	50	0,50	4,00	0,40
TMR2500100E	1,00	4,00	50	0,80	5,00	0,50
TMR2500120E	1,20	4,00	50	1,00	6,00	0,60
TMR2500150E	1,50	4,00	50	1,35	8,00	0,75
TMR2500200E	2,00	4,00	50	1,70	10,00	1,00
TMR2500250E	2,50	4,00	60	2,10	14,00	1,25
TMR2500300E	3,00	6,00	57	3,00	15,00	1,50
TMR2500400E	4,00	6,00	57	4,00	20,00	2,00
TMR2500500E	5,00	6,00	57	5,00	25,00	2,50
TMR2500600E	6,00	6,00	57	6,00	30,00	3,00

Notes

Notes

MS320

Microfresa
Micro-milling cutter
Mikrofräser
Micro fraise



P M K N S H O

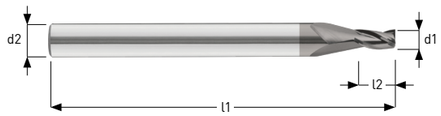


2xD | 30° | Z 3 | TUSA NORM

Art. Tusa Precision	d1 -0.01/+0.005	d2 h5	l1 0/+1	l2 0/+0.5
MS32000030	0,30	3,00	39	0,60
MS32000040	0,40	3,00	39	0,80
MS32000050	0,50	3,00	39	1,00
MS32000060	0,60	3,00	39	1,20
MS32000070	0,70	3,00	39	1,40
MS32000075	0,75	3,00	39	1,50
MS32000080	0,80	3,00	39	1,60
MS32000090	0,90	3,00	39	1,80
MS32000100	1,00	3,00	39	2,00
MS32000110	1,10	3,00	39	2,20
MS32000120	1,20	3,00	39	2,40
MS32000130	1,30	3,00	39	2,60
MS32000140	1,40	3,00	39	2,80
MS32000150	1,50	3,00	39	3,00
MS32000160	1,60	3,00	39	3,20
MS32000170	1,70	3,00	39	3,40
MS32000180	1,80	3,00	39	3,60
MS32000190	1,90	3,00	39	3,80
MS32000200	2,00	3,00	39	4,00
MS32000210	2,10	3,00	39	4,20
MS32000220	2,20	3,00	39	4,40
MS32000230	2,30	3,00	39	4,60
MS32000240	2,40	3,00	39	4,80
MS32000250	2,50	3,00	39	5,00
MS32000260	2,60	3,00	39	5,20
MS32000270	2,70	3,00	39	5,40
MS32000280	2,80	3,00	39	5,60
MS32000290	2,90	3,00	39	5,80
MS32000300	3,00	5,00	51	6,00
MS32000400	4,00	5,00	51	8,00
MS32000500	5,00	6,00	57	10,00
MS32000600	6,00	6,00	57	12,00

MS330

Microfresa
Micro-milling cutter
Mikrofräser
Micro fraise



P M K N S H O



3xD | 30° | Z 3 | TUSA NORM

Art. Tusa Precision	d1 -0.01/+0.005	d2 h5	l1 0/+1	l2 0/+0.5
MS33000030	0,30	3,00	39	0,90
MS33000040	0,40	3,00	39	1,20
MS33000050	0,50	3,00	39	1,50
MS33000060	0,60	3,00	39	1,80
MS33000070	0,70	3,00	39	2,10
MS33000075	0,75	3,00	39	2,30
MS33000080	0,80	3,00	39	2,40
MS33000090	0,90	3,00	39	2,70
MS33000100	1,00	3,00	39	3,00
MS33000110	1,10	3,00	39	3,30
MS33000120	1,20	3,00	39	3,60
MS33000130	1,30	3,00	39	3,90
MS33000140	1,40	3,00	39	4,20
MS33000150	1,50	3,00	39	4,50
MS33000160	1,60	3,00	39	4,80
MS33000170	1,70	3,00	39	5,10
MS33000180	1,80	3,00	39	5,40
MS33000190	1,90	3,00	39	5,70
MS33000200	2,00	3,00	39	6,00
MS33000210	2,10	3,00	39	6,30
MS33000220	2,20	3,00	39	6,60
MS33000230	2,30	3,00	39	6,90
MS33000240	2,40	3,00	39	7,20
MS33000250	2,50	3,00	39	7,50
MS33000260	2,60	3,00	39	7,80
MS33000270	2,70	3,00	39	8,10
MS33000280	2,80	3,00	39	8,40
MS33000290	2,90	3,00	39	8,70
MS33000300	3,00	5,00	51	9,00
MS33000400	4,00	5,00	51	12,00
MS33000500	5,00	6,00	57	15,00
MS33000600	6,00	6,00	57	18,00

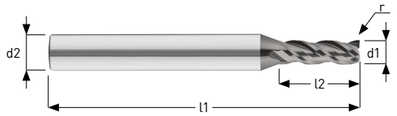
TTM325E
TTM325T

Microfresa
Micro-milling cutter

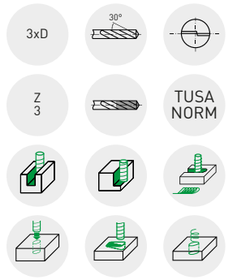
Microfresa torica
Corner radius micro-milling cutter

Mikrofräser
Micro fraise

Eckradius Mikrofräser
Micro fraise toriques







P M K N S H O

45°

Art. Tusa Precision	d1 +/-0.01	d2 h6	l1 +/-0.2	l2 0/+0.5
TTM3250100E	1,00	4,00	40	3,00
TTM3250120E	1,20	4,00	40	3,60
TTM3250150E	1,50	4,00	40	4,50
TTM3250158E	1,58	4,00	40	4,70
TTM3250180E	1,80	4,00	40	5,40
TTM3250200E	2,00	4,00	40	6,00
TTM3250238E	2,38	4,00	40	7,15
TTM3250250E	2,50	4,00	50	7,50
TTM3250300E	3,00	6,00	50	9,00
TTM3250317E	3,17	6,00	50	9,50
TTM3250350E	3,50	6,00	50	10,50
TTM3250397E	3,97	6,00	50	12,00
TTM3250400E	4,00	6,00	50	12,00
TTM3250450E	4,50	6,00	50	13,50
TTM3250476E	4,76	6,00	50	14,30
TTM3250500E	5,00	6,00	50	15,00
TTM3250556E	5,56	6,00	50	16,70
TTM3250600E	6,00	6,00	50	18,00

Cr

Art. Tusa Precision	d1 +/-0.01	d2 h6	l1 +/-0.2	l2 0/+0.5	r 0/-0.02
TTM3250100T01	1,00	4,00	40	3,00	0,10
TTM3250100T02	1,00	4,00	40	3,00	0,20
TTM3250120T01	1,20	4,00	40	3,60	0,10
TTM3250120T02	1,20	4,00	40	3,60	0,20
TTM3250150T01	1,50	4,00	40	4,50	0,10
TTM3250150T03	1,50	4,00	40	4,50	0,30
TTM3250180T01	1,80	4,00	40	5,40	0,10
TTM3250180T03	1,80	4,00	40	5,40	0,30
TTM3250200T01	2,00	4,00	40	6,00	0,10
TTM3250200T05	2,00	4,00	40	6,00	0,50
TTM3250250T02	2,50	6,00	50	7,50	0,20
TTM3250250T05	2,50	6,00	50	7,50	0,50
TTM3250300T02	3,00	6,00	50	9,00	0,20
TTM3250300T05	3,00	6,00	50	9,00	0,50
TTM3250400T02	4,00	6,00	50	12,00	0,20
TTM3250400T05	4,00	6,00	50	12,00	0,50
TTM3250600T05	6,00	6,00	50	18,00	0,50
TTM3250600T10	6,00	6,00	50	18,00	1,00

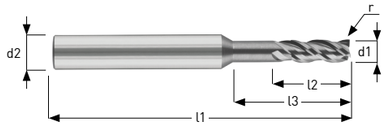
TTM350E
TTM350T

Microfresa
Micro-milling cutter

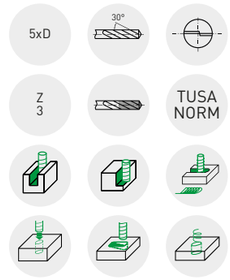
Microfresa torica
Corner radius micro-milling cutter

Mikrofräser
Micro fraise

Eckradius Mikrofräser
Micro fraise toriques







P M K N S H O

45°

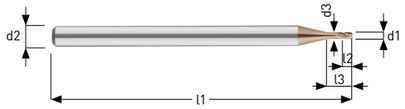
Art. Tusa Precision	d1 +/-0.01	d2 h6	l1 +/-0.2	l2 0/+0.5	l3 -0/+1
TTM3500100E	1,00	4,00	40	3,00	5,00
TTM3500120E	1,20	4,00	40	3,60	6,00
TTM3500150E	1,50	4,00	40	4,50	7,50
TTM3500158E	1,58	4,00	40	4,70	8,00
TTM3500180E	1,80	4,00	40	5,40	9,00
TTM3500200E	2,00	4,00	40	6,00	10,00
TTM3500238E	2,38	4,00	40	7,15	12,00
TTM3500250E	2,50	4,00	50	7,50	12,50
TTM3500300E	3,00	6,00	50	9,00	15,00
TTM3500317E	3,17	6,00	50	9,50	16,00
TTM3500350E	3,50	6,00	50	10,50	18,00
TTM3500397E	3,97	6,00	50	12,00	20,00
TTM3500400E	4,00	6,00	50	12,00	20,00
TTM3500450E	4,50	6,00	50	13,50	23,00
TTM3500476E	4,76	6,00	50	14,30	24,00
TTM3500500E	5,00	6,00	50	15,00	25,00
TTM3500556E	5,56	6,00	50	16,70	28,00
TTM3500600E	6,00	6,00	50	18,00	30,00

Cr

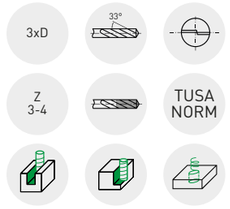
Art. Tusa Precision	d1 +/-0.01	d2 h6	l1 +/-0.2	l2 0/+0.5	l3 -0/+1	r 0/-0.02
TTM3500100T01	1,00	4,00	40	3,00	5,00	0,10
TTM3500100T02	1,00	4,00	40	3,00	5,00	0,20
TTM3500120T01	1,20	4,00	40	3,60	6,00	0,10
TTM3500120T02	1,20	4,00	40	3,60	6,00	0,20
TTM3500150T01	1,50	4,00	40	4,50	7,50	0,10
TTM3500150T03	1,50	4,00	40	4,50	7,50	0,30
TTM3500180T01	1,80	4,00	40	5,40	9,00	0,10
TTM3500180T03	1,80	4,00	40	5,40	9,00	0,30
TTM3500200T01	2,00	4,00	40	6,00	10,00	0,10
TTM3500200T05	2,00	4,00	40	6,00	10,00	0,50
TTM3500250T02	2,50	6,00	50	7,50	12,50	0,20
TTM3500250T05	2,50	6,00	50	7,50	12,50	0,50
TTM3500300T02	3,00	6,00	50	9,00	15,00	0,20
TTM3500300T05	3,00	6,00	50	9,00	15,00	0,50
TTM3500400T02	4,00	6,00	50	12,00	20,00	0,20
TTM3500400T05	4,00	6,00	50	12,00	20,00	0,50
TTM3500600T05	6,00	6,00	50	18,00	30,00	0,50
TTM3500600T10	6,00	6,00	50	18,00	30,00	1,00

TWF3

Microfresa Torx®
Micro-milling cutter Torx®
Mikrofräser Torx®
Micro fraise Torx®





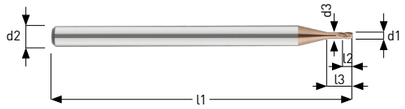


P M S

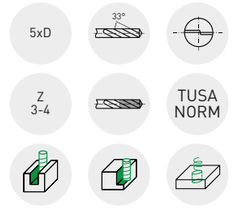
Art. Tusa Precision	Torx®	d1 0/-0.01	d2 h5	d3 0/-0.02	l1 0/+2	l2 0/+0.1	l3 0/-0.01	Z
TWF3000020	T4	0,20	3,00	0,18	39	0,30	0,60	3
TWF3000025	T5	0,25	3,00	0,24	39	0,38	0,75	3
TWF3000030	T6/T7	0,30	3,00	0,28	39	0,45	0,90	3
TWF3000040	T8/T10	0,40	3,00	0,38	39	0,60	1,20	4
TWF3000050	T10/T15	0,50	3,00	0,47	39	0,75	1,50	4
TWF3000060	T20	0,60	3,00	0,56	39	0,90	1,80	4
TWF3000080	T25	0,80	3,00	0,75	39	1,20	2,40	4
TWF3000100	T30	1,00	3,00	0,94	39	1,50	3,00	4

TWF5

Microfresa Torx®
Micro-milling cutter Torx®
Mikrofräser Torx®
Micro fraise Torx®







P M S

Art. Tusa Precision	Torx®	d1 0/-0.01	d2 h5	d3 0/-0.02	l1 0/+2	l2 0/+0.1	l3 0/-0.01	Z
TWF5000020	T4	0,20	3,00	0,18	39	0,30	1,00	3
TWF5000025	T5	0,25	3,00	0,24	39	0,38	1,25	3
TWF5000030	T6/T7	0,30	3,00	0,28	39	0,45	1,50	3
TWF5000040	T8/T10	0,40	3,00	0,38	39	0,60	2,00	4
TWF5000050	T10/T15	0,50	3,00	0,47	39	0,75	2,50	4
TWF5000060	T20	0,60	3,00	0,56	39	0,90	3,00	4
TWF5000080	T25	0,80	3,00	0,75	39	1,20	4,00	4
TWF5000100	T30	1,00	3,00	0,94	39	1,50	5,00	4

Notes

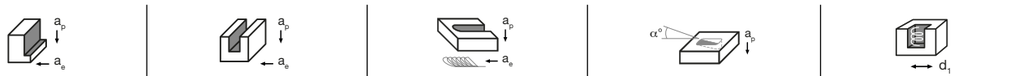
Notes

Parametri | Working parameters | Richtswerte | Paramètres | **139**

TTM225E - TTM225T

Parametri indicativi per la fresatura

Standard values for milling | Richtswerte für das Fräsen | Paramètres indicatifs pour fraisage



a_p	↖ 1xD$_1$	a_p	↖ 0,50xD$_1$	a_p	↖ 1,5xD$_1$	Angolo	8°	Angolo	8°
a_e	↖ 0,4xD$_1$	a_e	↖ 1xD$_1$	a_e	↖ 0,2xD$_1$	a_e	↖ 1xD$_1$	D_e	1,7xD$_1$
V_c	x1	V_c	x0,7	V_c	x1,2	f_z	x0,7		
f_z	x1	f_z	x0,6	f_z	x1,2				

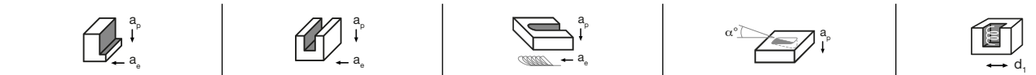
ISO Class	Cons | Adv	Velocità di taglio m/min Cutting Speed m/min							Avanzamento al dente fz mm/z Cutting Feed mm/z							
		Ø 1.00-1.20	Ø 1.50-1.80	Ø 2.00-2.50	Ø 3.00-3.50	Ø 3.97-4.00	Ø 4.50-5.00	Ø 5.56-6.00	Ø 1.00	Ø 1.20	Ø 1.50-1.58	Ø 1.80	Ø 2.00	Ø 2.38-2.50	Ø 3.00-3.50	Ø 3.97-6.00
P00	●	140	200	220	240	250	260	280	0.015	0.017	0.024	0.026	0.034	0.036	0.042	0.05
P01	●	140	200	220	240	250	260	280	0.015	0.017	0.024	0.026	0.034	0.036	0.042	0.05
P02	●	140	180	200	220	230	240	250	0.015	0.017	0.022	0.026	0.034	0.036	0.042	0.05
P03	●	140	200	220	240	250	260	280	0.014	0.016	0.022	0.024	0.032	0.034	0.04	0.048
P04	●	140	200	220	240	250	260	280	0.011	0.013	0.022	0.022	0.03	0.032	0.036	0.042
P05	●	140	200	220	240	250	260	280	0.015	0.016	0.022	0.024	0.032	0.034	0.038	0.046
P06	●	140	200	220	240	250	260	280	0.012	0.014	0.022	0.018	0.03	0.032	0.036	0.044
M01	●	140	200	220	240	250	260	280	0.012	0.014	0.016	0.018	0.03	0.032	0.036	0.044
M02	●	140	200	220	240	250	260	280	0.01	0.012	0.013	0.015	0.025	0.027	0.031	0.038
M03	●	140	200	220	240	250	260	280	0.01	0.012	0.013	0.015	0.025	0.027	0.031	0.038
K01	●	140	160	180	200	220	230	230	0.011	0.022	0.024	0.026	0.028	0.036	0.04	0.05
K03	●	120	140	160	180	220	200	200	0.009	0.02	0.021	0.023	0.025	0.032	0.038	0.044
K02	●	120	140	160	180	220	200	200	0.009	0.02	0.021	0.023	0.025	0.032	0.038	0.044
N01	●	140	200	200	220	250	260	280	0.018	0.02	0.026	0.028	0.036	0.04	0.052	0.06
N02	●	140	200	200	220	250	260	280	0.018	0.02	0.026	0.028	0.036	0.04	0.052	0.06
N03	●	140	200	200	220	250	260	280	0.018	0.02	0.026	0.028	0.036	0.04	0.052	0.06
N04	●	140	200	200	240	250	260	280	0.02	0.02	0.026	0.028	0.036	0.04	0.05	0.06
S01	●	120	130	140	150	160	170	170	0.007	0.008	0.009	0.01	0.01	0.012	0.015	0.018
S02	●	140	180	200	220	230	230	240	0.007	0.008	0.009	0.01	0.01	0.012	0.015	0.018
S03	●	120	130	140	150	160	170	170	0.007	0.008	0.009	0.01	0.01	0.012	0.015	0.018
S04	●	120	130	140	150	160	170	170	0.016	0.018	0.02	0.022	0.028	0.03	0.036	0.044
H01	●	140	140	180	200	210	220	220	0.01	0.012	0.014	0.018	0.02	0.026	0.029	0.04
H02	●	140	140	180	200	210	220	220	0.01	0.012	0.014	0.018	0.02	0.026	0.029	0.04
H03	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
O01	●	140	200	200	220	250	260	280	0.018	0.02	0.026	0.028	0.036	0.04	0.052	0.06
O02	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
O03	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
O04	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
O05	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

TTM250E - TTM250T

Parametri indicativi per la fresatura

Standard values for milling | Richtswerte für das Fräsen | Paramètres indicatifs pour fraisage



a_p	↖ 1xD$_1$	a_p	↖ 0,50xD$_1$	a_p	↖ 1,5xD$_1$	Angolo	8°	Angolo	8°
a_e	↖ 0,4xD$_1$	a_e	↖ 1xD$_1$	a_e	↖ 0,2xD$_1$	a_e	↖ 1xD$_1$	D_e	1,7xD$_1$
V_c	x1	V_c	x0,7	V_c	x1,2	f_z	x0,7		
f_z	x1	f_z	x0,6	f_z	x1,2				

ISO Class	Cons | Adv	Velocità di taglio m/min Cutting Speed m/min							Avanzamento al dente fz mm/z Cutting Feed mm/z							
		Ø 1.00-1.20	Ø 1.50-1.80	Ø 2.00-2.50	Ø 3.00-3.50	Ø 3.97-4.00	Ø 4.50-5.00	Ø 5.56-6.00	Ø 1.00	Ø 1.20	Ø 1.50-1.58	Ø 1.80	Ø 2.00	Ø 2.38-2.50	Ø 3.00-3.50	Ø 3.97-6.00
P00	●	140	200	220	240	250	260	280	0.012	0.0136	0.0192	0.0208	0.0272	0.0288	0.0336	0.04
P01	●	140	200	220	240	250	260	280	0.012	0.0136	0.0192	0.0208	0.0272	0.0288	0.0336	0.04
P02	●	140	180	200	220	230	240	250	0.012	0.0136	0.0176	0.0208	0.0272	0.0288	0.0336	0.04
P03	●	140	200	220	240	250	260	280	0.0112	0.0128	0.0176	0.0192	0.0256	0.0272	0.032	0.0384
P04	●	140	200	220	240	250	260	280	0.0088	0.0104	0.0176	0.0176	0.024	0.0256	0.0288	0.0336
P05	●	140	200	220	240	250	260	280	0.012	0.0128	0.0176	0.0192	0.0256	0.0272	0.0304	0.0368
P06	●	140	200	220	240	250	260	280	0.0096	0.0112	0.0176	0.0144	0.024	0.0256	0.0288	0.0352
M01	●	140	200	220	240	250	260	280	0.0096	0.0112	0.0128	0.0144	0.024	0.0256	0.0288	0.0352
M02	●	140	200	220	240	250	260	280	0.008	0.0096	0.0104	0.012	0.02	0.0216	0.0248	0.0304
M03	●	140	200	220	240	250	260	280	0.008	0.0096	0.0104	0.012	0.02	0.0216	0.0248	0.0304
K01	●	140	160	180	200	220	230	230	0.0088	0.0176	0.0192	0.0208	0.0224	0.0288	0.032	0.04
K03	●	120	140	160	180	220	200	200	0.0072	0.016	0.0168	0.0184	0.02	0.0256	0.0304	0.0352
K02	●	120	140	160	180	220	200	200	0.0072	0.016	0.0168	0.0184	0.02	0.0256	0.0304	0.0352
N01	●	140	200	200	220	250	260	280	0.0144	0.016	0.0208	0.0224	0.0288	0.032	0.0416	0.048
N02	●	140	200	200	220	250	260	280	0.0144	0.016	0.0208	0.0224	0.0288	0.032	0.0416	0.048
N03	●	140	200	200	220	250	260	280	0.0144	0.016	0.0208	0.0224	0.0288	0.032	0.0416	0.048
N04	●	140	200	200	240	250	260	280	0.016	0.016	0.0208	0.0224	0.0288	0.032	0.04	0.048
S01	●	120	130	140	150	160	170	170	0.0056	0.0064	0.0072	0.008	0.008	0.0096	0.012	0.0144
S02	●	140	180	200	220	230	230	240	0.0056	0.0064	0.0072	0.008	0.008	0.0096	0.012	0.0144
S03	●	120	130	140	150	160	170	170	0.0056	0.0064	0.0072	0.008	0.008	0.0096	0.012	0.0144
S04	●	120	130	140	150	160	170	170	0.0128	0.0144	0.016	0.0176	0.0224	0.024	0.0288	0.0352
H01	●	140	140	180	200	210	220	220	0.008	0.0096	0.0112	0.0144	0.016	0.0208	0.0232	0.032
H02	●	140	140	180	200	210	220	220	0.008	0.0096	0.0112	0.0144	0.016	0.0208	0.0232	0.032
H03	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
O01	●	140	200	200	220	250	260	280	0.0144	0.016	0.0208	0.0224	0.0288	0.032	0.0416	0.048
O02	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
O03	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
O04	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
O05	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

TMR230E

Parametri indicativi per la fresatura

Standard values for milling | Richtswerte für das Fräsen | Paramètres indicatifs pour fraisage

ISO Class	Cons | Adv	Velocità di taglio m/min Cutting Speed m/min Ø 0.50-0.80	Velocità di taglio m/min Cutting Speed m/min Ø 1.00-6.00	Avanzamento al dente fz mm/z Cutting Feed mm/z Ø 0.50-0.80	Ø 1.00-1.50	Ø 2.00-3.00	Ø 4.00	Ø 5.00	Ø 6.00
P00	●	60-80	80-100	0.011-0.019	0.038-0.048	0.062-0.094	0.125	0.156	0.188
P01	●	60-80	80-100	0.011-0.019	0.038-0.048	0.062-0.094	0.125	0.156	0.188
P02	●	60-80	80-100	0.011-0.019	0.038-0.048	0.062-0.094	0.125	0.156	0.188
P03	●	50-70	60-80	0.011-0.019	0.038-0.048	0.062-0.094	0.125	0.156	0.188
P04	●	40-60	50-70	0.011-0.019	0.038-0.048	0.062-0.094	0.125	0.156	0.188
P05	●	40-60	50-70	0.011-0.019	0.038-0.048	0.062-0.094	0.125	0.156	0.188
P06	●	40-60	50-70	0.011-0.019	0.038-0.048	0.062-0.094	0.125	0.156	0.188
M01	●	40-60	50-70	0.011-0.019	0.038-0.048	0.062-0.094	0.125	0.156	0.188
M02	●	40-60	50-70	0.011-0.019	0.038-0.048	0.062-0.094	0.125	0.156	0.188
M03	●	40-60	50-70	0.011-0.019	0.038-0.048	0.062-0.094	0.125	0.156	0.188
K01	●	40-60	50-70	0.011-0.019	0.038-0.048	0.062-0.094	0.125	0.156	0.188
K03	●	40-60	50-70	0.011-0.019	0.038-0.048	0.062-0.094	0.125	0.156	0.188
K02	●	40-60	50-70	0.011-0.019	0.038-0.048	0.062-0.094	0.125	0.156	0.188
N01	●	80-100	100-120	0.011-0.019	0.038-0.048	0.062-0.094	0.125	0.156	0.188
N02	●	80-100	100-120	0.011-0.019	0.038-0.048	0.062-0.094	0.125	0.156	0.188
N03	●	80-100	100-120	0.011-0.019	0.038-0.048	0.062-0.094	0.125	0.156	0.188
N04	●	80-100	100-120	0.011-0.019	0.038-0.048	0.062-0.094	0.125	0.156	0.188
S01	●	20-40	30-50	0.011-0.019	0.038-0.048	0.062-0.094	0.125	0.156	0.188
S02	●	20-40	30-50	0.011-0.019	0.038-0.048	0.062-0.094	0.125	0.156	0.188
S03	●	20-40	30-50	0.011-0.019	0.038-0.048	0.062-0.094	0.125	0.156	0.188
S04	●	20-40	30-50	0.011-0.019	0.038-0.048	0.062-0.094	0.125	0.156	0.188
H01	●	30-50	40-60	0.011-0.019	0.038-0.048	0.062-0.094	0.125	0.156	0.188
H02	●	20-40	30-50	0.011-0.019	0.038-0.048	0.062-0.094	0.125	0.156	0.188
H03	○	-	-	-	-	-			
O01	●	80-100	100-120	0.011-0.019	0.038-0.048	0.062-0.094	0.125	0.156	0.188
O02	○	-	-	-	-	-	-	-	-
O03	○	-	-	-	-	-	-	-	-
O04	○	-	-	-	-	-	-	-	-
O05	○	-	-	-	-	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

TMR250E

Parametri indicativi per la fresatura

Standard values for milling | Richtswerte für das Fräsen | Paramètres indicatifs pour fraisage

ISO Class	Cons | Adv	Velocità di taglio m/min Cutting Speed m/min Ø 0.50-0.80	Velocità di taglio m/min Cutting Speed m/min Ø 1.00-6.00	Avanzamento al dente fz mm/z Cutting Feed mm/z Ø 0.50-0.80	Ø 1.00-1.50	Ø 2.00-3.00	Ø 4.00	Ø 5.00	Ø 6.00
P00	●	60-80	80-100	0.009-0.015	0.030-0.038	0.049-0.075	0.100	0.125	0.150
P01	●	60-80	80-100	0.009-0.015	0.030-0.038	0.049-0.075	0.100	0.125	0.150
P02	●	60-80	80-100	0.009-0.015	0.030-0.038	0.049-0.075	0.100	0.125	0.150
P03	●	50-70	60-80	0.009-0.015	0.030-0.038	0.049-0.075	0.100	0.125	0.150
P04	●	40-60	50-70	0.009-0.015	0.030-0.038	0.049-0.075	0.100	0.125	0.150
P05	●	40-60	50-70	0.009-0.015	0.030-0.038	0.049-0.075	0.100	0.125	0.150
P06	●	40-60	50-70	0.009-0.015	0.030-0.038	0.049-0.075	0.100	0.125	0.150
M01	●	40-60	50-70	0.009-0.015	0.030-0.038	0.049-0.075	0.100	0.125	0.150
M02	●	40-60	50-70	0.009-0.015	0.030-0.038	0.049-0.075	0.100	0.125	0.150
M03	●	40-60	50-70	0.009-0.015	0.030-0.038	0.049-0.075	0.100	0.125	0.150
K01	●	40-60	50-70	0.009-0.015	0.030-0.038	0.049-0.075	0.100	0.125	0.150
K03	●	40-60	50-70	0.009-0.015	0.030-0.038	0.049-0.075	0.100	0.125	0.150
K02	●	40-60	50-70	0.009-0.015	0.030-0.038	0.049-0.075	0.100	0.125	0.150
N01	●	80-100	100-120	0.009-0.015	0.030-0.038	0.049-0.075	0.100	0.125	0.150
N02	●	80-100	100-120	0.009-0.015	0.030-0.038	0.049-0.075	0.100	0.125	0.150
N03	●	80-100	100-120	0.009-0.015	0.030-0.038	0.049-0.075	0.100	0.125	0.150
N04	●	80-100	100-120	0.009-0.015	0.030-0.038	0.049-0.075	0.100	0.125	0.150
S01	●	20-40	30-50	0.009-0.015	0.030-0.038	0.049-0.075	0.100	0.125	0.150
S02	●	20-40	30-50	0.009-0.015	0.030-0.038	0.049-0.075	0.100	0.125	0.150
S03	●	20-40	30-50	0.009-0.015	0.030-0.038	0.049-0.075	0.100	0.125	0.150
S04	●	20-40	30-50	0.009-0.015	0.030-0.038	0.049-0.075	0.100	0.125	0.150
H01	●	30-50	40-60	0.009-0.015	0.030-0.038	0.049-0.075	0.100	0.125	0.150
H02	●	20-40	30-50	0.009-0.015	0.030-0.038	0.049-0.075	0.100	0.125	0.150
H03	○	-	-	-	-	-	-	-	-
O01	●	80-100	100-120	0.009-0.015	0.030-0.038	0.049-0.075	0.100	0.125	0.150
O02	○	-	-	-	-	-	-	-	-
O03	○	-	-	-	-	-	-	-	-
O04	○	-	-	-	-	-	-	-	-
O05	○	-	-	-	-	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

MS320 - MS330

Parametri indicativi per la fresatura

Standard values for milling | Richtswerte für das Fräsen | Paramètres indicatifs pour fraisage



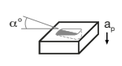
a_p	≤ 1 x D_1
a_e	≤ 0,4 x D_1
V_c	x1
f_z	x1



a_p	≤ 0,51 x D_1
a_e	≤ 1 x D_1
V_c	x 0,7
f_z	x 0,6



a_p	≤ 1,5 x D_1
a_e	≤ 0,2 x D_1
V_c	x1,2
f_z	x1,2



Angolo	8°
a_e	≤ 1 x D_1
f_z	x 0,7



Angolo	8°
D_e	1,7 x D_1

ISO Class	Cons | Adv	Velocità di taglio Cutting Speed m/min	Avanzamento al dente fz mm/z Cutting Feed mm/z Ø 0.30-0.60	Ø 0.70-1.40	Ø 1.50-2.90	Ø 3.00-6.00
P00	●	60-80	0.005-0.01	0.008-0.02	0.018-0.04	0.020-0.040
P01	●	60-80	0.005-0.01	0.008-0.2	0.018-0.04	0.020-0.040
P02	●	60-80	0.005-0.01	0.008-0.02	0.018-0.04	0.020-0.040
P03	●	50-70	0.005-0.01	0.008-0.02	0.018-0.04	0.020-0.040
P04	●	40-60	0.004-0.01	0.006-0.02	0.015-0.035	0.020-0.040
P05	●	30-50	0.004-0.01	0.006-0.02	0.015-0.035	0.015-0.035
P06	●	30-50	0.004-0.01	0.006-0.02	0.015-0.035	0.015-0.035
M01	●	25-40	0.004-0.008	0.005-0.016	0.014-0.028	0.015-0.035
M02	●	25-40	0.004-0.008	0.005-0.016	0.014-0.028	0.015-0.035
M03	●	25-40	0.004-0.008	0.005-0.016	0.014-0.028	0.015-0.035
K01	●	40-70	0.005-0.01	0.008-0.02	0.018-0.04	0.030-0.060
K03	●	30-60	0.004-0.01	0.006-0.02	0.015-0.035	0.030-0.060
K02	●	30-60	0.004-0.01	0.006-0.02	0.015-0.035	0.030-0.060
N01	●	70-100	0.004-0.01	0.006-0.02	0.015-0.035	0.030-0.060
N02	●	80-120	0.005-0.01	0.008-0.02	0.018-0.04	0.030-0.060
N03	●	60-100	0.005-0.01	0.008-0.02	0.018-0.04	0.030-0.060
N04	●	25-80	0.004-0.01	0.006-0.02	0.015-0.04	0.030-0.060
S01	●	25-40	0.003-0.008	0.015-0.03	0.015-0.03	0.025-0.045
S02	●	25-40	0.003-0.008	0.015-0.03	0.015-0.03	0.025-0.045
S03	●	25-40	0.003-0.008	0.015-0.03	0.015-0.03	0.025-0.045
S04	●	25-50	0.003-0.008	0.006-0.015	0.012-0.03	0.025-0.045
H01	●	25-40	0.002-0.004	0.004-0.006	0.004-0.006	0.005-0.008
H02	●	25-40	0.002-0.004	0.004-0.006	0.004-0.006	0.005-0.008
H03	○	-	-	-	-	-
O01	●	80-120	0.005-0.01	0.008-0.02	0.018-0.04	0.030-0.060
O02	○	-	-	-	-	-
O03	○	-	-	-	-	-
O04	○	-	-	-	-	-
O05	○	-	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

Made in Switzerland

TTM325E - TTM325T

Parametri indicativi per la fresatura

Standard values for milling | Richtswerte für das Fräsen | Paramètres indicatifs pour fraisage

ISO Class	Cons | Adv	Velocità di taglio m/min Cutting Speed m/min Ø 1.00-1.20	Ø 1.50-2.50	Ø 3.00-4.76	Ø 5.00-5.56	Ø 6.00	Avanzamento al dente fz mm/z Cutting Feed mm/z Ø 1.00-1.20	Ø 1.50-1.80	Ø 2.00-2.50	Ø 3.00-3.97	Ø 4.00-4.76	Ø 5.00-5.56	Ø 6.00
P00	●	100	120	140	150	160	0.0046	0.0065	0.0091	0.013	0.02	0.026	0.033
P01	●	100	120	140	150	160	0.0046	0.0065	0.0091	0.013	0.02	0.026	0.033
P02	●	100	120	140	150	160	0.0046	0.0065	0.0091	0.013	0.02	0.026	0.033
P03	●	100	120	140	150	160	0.0049	0.007	0.0098	0.014	0.021	0.027	0.034
P04	●	100	120	140	150	160	0.0042	0.006	0.0084	0.012	0.017	0.022	0.028
P05	●	100	120	140	150	160	0.0035	0.005	0.007	0.01	0.015	0.02	0.025
P06	●	100	120	140	150	160	0.0035	0.005	0.007	0.01	0.015	0.02	0.025
M01	●	100	120	140	150	160	0.0035	0.005	0.007	0.01	0.015	0.02	0.025
M02	●	100	120	140	150	160	0.0035	0.005	0.007	0.01	0.015	0.02	0.025
M03	●	100	120	140	150	160	0.0035	0.005	0.007	0.01	0.015	0.02	0.025
K01	●	100	120	140	150	160	0.0042	0.006	0.0084	0.012	0.017	0.022	0.028
K03	●	100	120	140	150	160	0.0042	0.006	0.0084	0.012	0.017	0.022	0.028
K02	●	100	120	140	150	160	0.0042	0.006	0.0084	0.012	0.017	0.022	0.028
N01	●	100	120	150	170	180	0.01	0.016	0.021	0.034	0.035	0.036	0.037
N02	●	100	120	150	170	180	0.01	0.016	0.021	0.034	0.035	0.036	0.037
N03	●	100	120	150	170	180	0.01	0.016	0.021	0.034	0.035	0.036	0.037
N04	●	100	120	150	170	180	0.01	0.016	0.021	0.034	0.035	0.036	0.037
S01	●	40	50	50	80	80	0.0035	0.005	0.007	0.01	0.014	0.018	0.021
S02	●	60	60	80	100	120	0.0035	0.005	0.007	0.01	0.014	0.018	0.021
S03	●	40	50	50	80	80	0.0035	0.005	0.007	0.01	0.014	0.018	0.021
S04	●	80	90	110	120	120	0.0032	0.0045	0.0063	0.01	0.013	0.016	0.019
H01	○	-	-	-	-	-	-	-	-	-	-	-	-
H02	○	-	-	-	-	-	-	-	-	-	-	-	-
H03	○	-	-	-	-	-	-	-	-	-	-	-	-
O01	●	100	120	150	170	180	0.01	0.016	0.021	0.034	0.035	0.036	0.037
O02	○	-	-	-	-	-	-	-	-	-	-	-	-
O03	○	-	-	-	-	-	-	-	-	-	-	-	-
O04	○	-	-	-	-	-	-	-	-	-	-	-	-
O05	○	-	-	-	-	-	-	-	-	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

TTM350E - TTM350T

Parametri indicativi per la fresatura

Standard values for milling | Richtwerte für das Fräsen | Paramètres indicatifs pour fraisage

ISO Class	Cons | Adv	Velocità di taglio m/min Cutting Speed m/min					Avanzamento al dente fz mm/z Cutting Feed mm/z						
		Ø 1.00-1.20	Ø 1.50-2.50	Ø 3.00-4.76	Ø 5.00-5.56	Ø 6.00	Ø 1.00-1.20	Ø 1.50-1.80	Ø 2.00-2.50	Ø 3.00-3.97	Ø 4.00-4.76	Ø 5.00-5.56	Ø 6.00
P00	●	100	120	140	150	160	0,004	0,005	0,007	0,010	0,016	0,021	0,026
P01	●	100	120	140	150	160	0,004	0,005	0,007	0,010	0,016	0,021	0,026
P02	●	100	120	140	150	160	0,004	0,005	0,007	0,010	0,016	0,021	0,026
P03	●	100	120	140	150	160	0,004	0,006	0,008	0,011	0,017	0,022	0,027
P04	●	100	120	140	150	160	0,003	0,005	0,007	0,010	0,014	0,018	0,022
P05	●	100	120	140	150	160	0,003	0,004	0,006	0,008	0,012	0,016	0,020
P06	●	100	120	140	150	160	0,003	0,004	0,006	0,008	0,012	0,016	0,020
M01	●	100	120	140	150	160	0,003	0,004	0,006	0,008	0,012	0,016	0,020
M02	●	100	120	140	150	160	0,003	0,004	0,006	0,008	0,012	0,016	0,020
M03	●	100	120	140	150	160	0,003	0,004	0,006	0,008	0,012	0,016	0,020
K01	●	100	120	140	150	160	0,003	0,005	0,007	0,010	0,014	0,018	0,022
K03	●	100	120	140	150	160	0,003	0,005	0,007	0,010	0,014	0,018	0,022
K02	●	100	120	140	150	160	0,003	0,005	0,007	0,010	0,014	0,018	0,022
N01	●	100	120	160	170	180	0,008	0,013	0,017	0,027	0,028	0,029	0,030
N02	●	100	120	160	170	180	0,008	0,013	0,017	0,027	0,028	0,029	0,030
N03	●	100	120	160	170	180	0,008	0,013	0,017	0,027	0,028	0,029	0,030
N04	●	100	120	160	170	180	0,008	0,013	0,017	0,027	0,028	0,029	0,030
S01	●	40	50	60	80	80	0,003	0,004	0,006	0,008	0,011	0,014	0,017
S02	●	60	80	100	100	120	0,003	0,004	0,006	0,008	0,011	0,014	0,017
S03	●	40	50	60	80	80	0,003	0,004	0,006	0,008	0,011	0,014	0,017
S04	●	80	100	120	120	120	0,003	0,004	0,005	0,008	0,010	0,013	0,015
H01	○	-	-	-	-	-	-	-	-	-	-	-	-
H02	○	-	-	-	-	-	-	-	-	-	-	-	-
H03	○	-	-	-	-	-	-	-	-	-	-	-	-
O01	●	100	120	160	170	180	0,008	0,013	0,017	0,027	0,028	0,029	0,030
O02	○	-	-	-	-	-	-	-	-	-	-	-	
O03	○	-	-	-	-	-	-	-	-	-	-	-	-
O04	○	-	-	-	-	-	-	-	-	-	-	-	-
O05	○	-	-	-	-	-	-	-	-	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

Made in Switzerland

TWF3 - TWF5

Parametri indicativi per la fresatura

Standard values for milling | Richtwerte für das Fräsen | Paramètres indicatifs pour fraisage





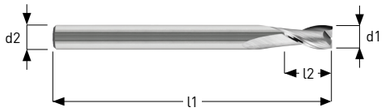
		Pas	0.2 - 0.8 D_1
a_p	↖ 0.5 x D_1		
a_e	↖ 0.1 x D_1	-	-
V_c	x 1	-	-
f_z	x 1	-	-

ISO Class	Cons | Adv	Velocità di taglio m/min Cutting Speed m/min								Avanzamento mm/giro Cutting Feed mm/rev			
		Ø 0.20	Ø 0.25	Ø 0.30	Ø 0.40	Ø 0.50	Ø 0.60	Ø 0.80	Ø 1.00	Ø 0.20-0.25	Ø 0.30-0.40	Ø 0.50-0.60	Ø 0.80-1.00
P00	○	-	-	-	-	-	-	-	-	-	-	-	-
P01	○	-	-	-	-	-	-	-	-	-	-	-	-
P02	○	-	-	-	-	-	-	-	-	-	-	-	-
P03	○	-	-	-	-	-	-	-	-	-	-	-	-
P04	○	-	-	-	-	-	-	-	-	-	-	-	-
P05	●	30	40	50	60	70	80	110	120	0.0015-0.0025	0.003-0.0045	0.006-0.0065	0.008-0.01
P06	●	30	40	50	60	70	80	110	120	0.0015-0.0025	0.003-0.0045	0.006-0.0065	0.008-0.01
M01	●	30	40	50	60	70	80	110	120	0.0015-0.0025	0.003-0.0045	0.006-0.0065	0.008-0.01
M02	●	30	40	50	60	70	80	110	120	0.0015-0.0025	0.003-0.0045	0.006-0.0065	0.008-0.01
M03	●	30	40	50	60	70	80	110	120	0.0015-0.0025	0.003-0.0045	0.006-0.0065	0.008-0.01
K01	○	-	-	-	-	-	-	-	-	-	-	-	-
K03	○	-	-	-	-	-	-	-	-	-	-	-	-
K02	○	-	-	-	-	-	-	-	-	-	-	-	-
N01	○	-	-	-	-	-	-	-	-	-	-	-	-
N02	○	-	-	-	-	-	-	-	-	-	-	-	-
N03	○	-	-	-	-	-	-	-	-	-	-	-	-
N04	○	-	-	-	-	-	-	-	-	-	-	-	-
S01	●	30	40	50	60	70	80	110	120	0.0015-0.0025	0.003-0.0045	0.006-0.0065	0.008-0.01
S02	○	-	-	-	-	-	-	-	-	-	-	-	-
S03	●	30	40	50	60	70	80	110	120	0.0015-0.0025	0.003-0.0045	0.006-0.0065	0.008-0.01
S04	●	30	40	50	60	70	80	110	120	0.0015-0.0025	0.003-0.0045	0.006-0.0065	0.008-0.01
H01	○	-	-	-	-	-	-	-	-	-	-	-	-
H02	○	-	-	-	-	-	-	-	-	-	-	-	-
H03	○	-	-	-	-	-	-	-	-	-	-	-	-
O01	○	-	-	-	-	-	-	-	-	-	-	-	-
O02	○	-	-	-	-	-	-	-	-	-	-	-	-
O03	○	-	-	-	-	-	-	-	-	-	-	-	-
O04	○	-	-	-	-	-	-	-	-	-	-	-	-
O05	○	-	-	-	-	-	-	-	-	-	-	-	-

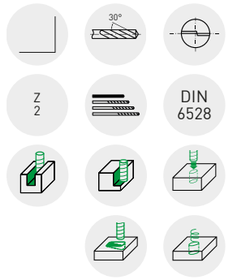
● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

MS122

Fresa elicoidale - serie corta
Twist cutter - short series
Spiralfräser - kurze Serie
Fraise hélicoïdal - série courte







P M K

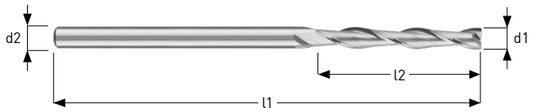
Art. Tusa Precision	d1 h11	d2 h6	l1 +1/0	l2 +1/0
MS12200020	2,00	2,00	42	6,00
MS12200025	2,50	2,50	42	7,00
MS12200030	3,00	3,00	45	7,00
MS12200035	3,50	3,50	50	7,00
MS12200040	4,00	4,00	50	8,00
MS12200045	4,50	4,50	50	8,00
MS12200050	5,00	5,00	50	10,00
MS12200055	5,50	5,50	57	10,00
MS12200060	6,00	6,00	57	10,00
MS12200070	7,00	7,00	60	13,00
MS12200080	8,00	8,00	63	16,00
MS12200090	9,00	9,00	67	16,00
MS12200100	10,00	10,00	72	19,00
MS12200110*	11,00	11,00	83	22,00
MS12200120*	12,00	12,00	83	22,00
MS12200140*	14,00	14,00	83	22,00
MS12200160*	16,00	16,00	92	26,00
MS12200180*	18,00	18,00	92	26,00
MS12200200*	20,00	20,00	101	32,00

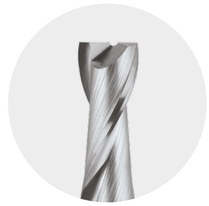
*** Disponibili su richiesta, minimo 5 pz**
* Available on request, minimum qty 5 pcs
* Verfügbar auf Anfrag, mindestmenge 5 Stk
* Disponible sur demande, au moins 5 pièces

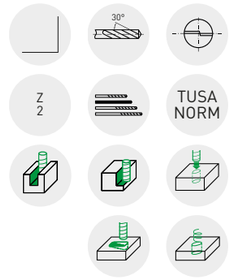
Parametri | Working parameters | Richtswerte | Paramètres | **150**

MS122XL

Fresa elicoidale - serie media
Twist cutter - medium series
Spiralfräser - mittelere Serie
Fraise hélicoïdal - série moyenne





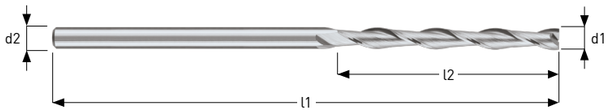


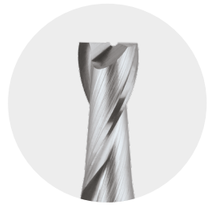
P M K

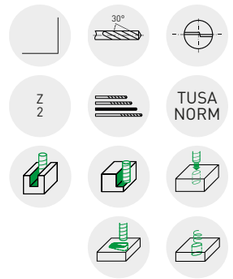
Art. Tusa Precision	d1 h11	d2 h6	l1 +1/0	l2 +1/0
MS122L0030	3,00	3,00	55	20,00
MS122L0040	4,00	4,00	60	20,00
MS122L0050	5,00	5,00	60	20,00
MS122L0060	6,00	6,00	65	24,00
MS122L0080	8,00	8,00	80	32,00
MS122L0100	10,00	10,00	80	32,00
MS122L0120*	12,00	12,00	100	50,00
MS122L0140*	14,00	14,00	100	50,00
MS122L0160*	16,00	16,00	100	50,00
MS122L0180*	18,00	18,00	100	50,00
MS122L0200*	20,00	20,00	100	50,00

MS122XLS

Fresa elicoidale - serie lunga
Twist cutter - long series
Spiralfräser - lange Serie
Fraise hélicoïdal - série longue







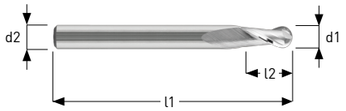
P M K

Art. Tusa Precision	d1 h11	d2 h6	l1 +/-1	l2 +/-0.2
MS122S0040	4,00	4,00	75	40,00
MS122S0050	5,00	5,00	80	40,00
MS122S0060	6,00	6,00	80	45,00
MS122S0080	8,00	8,00	100	50,00
MS122S0100	10,00	10,00	100	50,00
MS122S0120*	12,00	12,00	150	70,00
MS122S0140*	14,00	14,00	150	75,00
MS122S0160*	16,00	16,00	150	75,00
MS122S0180*	18,00	18,00	150	75,00
MS122S0200*	20,00	20,00	150	75,00

Parametri | Working parameters | Richtswerte | Paramètres | **151 - 152**

MS123

Fresa semisferica - serie corta
Ball nose end mill - short series
Kugelfräser - kurze Serie
Fraise hémisphérique - série courte





P M K

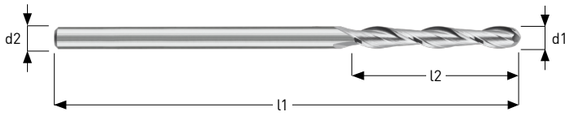
Art. Tusa Precision	d1 h11	d2 h6	l1 +1/0	l2 +1/0	r +/- 0.04/0.05
MS12300020	2,00	2,00	42	6,00	1,00
MS12300025	2,50	2,50	42	7,00	1,25
MS12300030	3,00	3,00	45	7,00	1,50
MS12300040	4,00	4,00	50	8,00	2,00
MS12300050	5,00	5,00	50	10,00	2,50
MS12300060	6,00	6,00	57	10,00	3,00
MS12300070	7,00	7,00	60	13,00	3,50
MS12300080	8,00	8,00	63	16,00	4,00
MS12300090	9,00	9,00	67	16,00	4,50
MS12300100	10,00	10,00	72	19,00	5,00
MS12300110*	11,00	11,00	83	22,00	5,50
MS12300120*	12,00	12,00	83	22,00	6,00
MS12300140*	14,00	14,00	83	22,00	7,00
MS12300160*	16,00	16,00	92	26,00	8,00
MS12300180*	18,00	18,00	92	26,00	9,00
MS12300200*	20,00	20,00	101	32,00	10,00

*** Disponibili su richiesta, minimo 5 pz**
* Available on request, minimum qty 5 pcs
* Verfügbar auf Anfrag, mindestmenge 5 Stk
* Disponible sur demande, au moins 5 pièces

Parametri | Working parameters | Richtswerte | Paramètres | **153**

MS123XL

Fresa semisferica - serie media
Ball nose end mill - medium series
Kugelfräser - mittelere Serie
Fraise hémisphérique - série moyenne



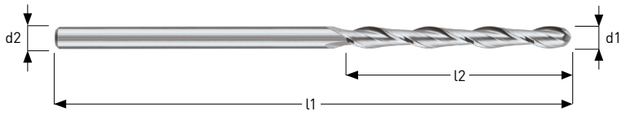


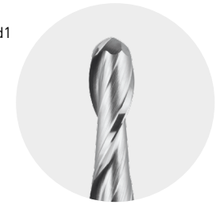
P M K

Art. Tusa Precision	d1 h11	d2 h6	l1 +1/0	l2 +1/0	r +/- 0.04/0.05
MS123L0030	3,00	3,00	55	20,00	1,50
MS123L0040	4,00	4,00	60	20,00	2,00
MS123L0050	5,00	5,00	60	20,00	2,50
MS123L0060	6,00	6,00	65	24,00	3,00
MS123L0080	8,00	8,00	80	32,00	4,00
MS123L0100	10,00	10,00	80	32,00	5,00
MS123L0120*	12,00	12,00	100	50,00	6,00
MS123L0140*	14,00	14,00	100	50,00	7,00
MS123L0160*	16,00	16,00	100	50,00	8,00
MS123L0200*	20,00	20,00	100	50,00	10,00

MS123XLS

Fresa semisferica - serie lunga
Ball nose end mill - long series
Kugelfräser - lange Serie
Fraise hémisphérique - série longue





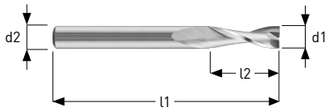
P M K

Art. Tusa Precision	d1 h11	d2 h6	l1 +1/0	l2 +1/0	r +/- 0.04/0.05
MS123S0040	4,00	4,00	75	40,00	2,00
MS123S0050	5,00	5,00	80	40,00	2,50
MS123S0060	6,00	6,00	80	45,00	3,00
MS123S0080	8,00	8,00	100	50,00	4,00
MS123S0100	10,00	10,00	100	50,00	5,00
MS123S0120*	12,00	12,00	150	70,00	6,00
MS123S0140*	14,00	14,00	150	75,00	7,00
MS123S0160*	16,00	16,00	150	75,00	8,00
MS123S0200*	20,00	20,00	150	75,00	10,00

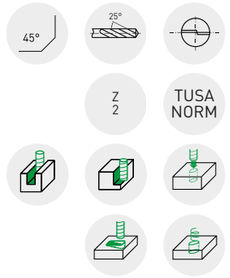
Parametri | Working parameters | Richtswerte | Paramètres | **154 - 155**

MS124

Fresa elicoidale - serie corta
Twist cutter - short series
Spiralfräser - kurze Serie
Fraise hélicoïdal - série courte







N O

Art. Tusa Precision	d1 h11	d2 h6	l1 +1/0	l2 +1/0
MS12400020	2,00	2,00	40	10,00
MS12400030	3,00	3,00	40	12,00
MS12400040	4,00	4,00	40	12,00
MS12400050	5,00	5,00	50	15,00
MS12400060	6,00	6,00	60	18,00
MS12400070	7,00	7,00	60	18,00
MS12400080	8,00	8,00	60	18,00
MS12400090	9,00	9,00	70	22,00
MS12400100	10,00	10,00	70	22,00
MS12400120*	12,00	12,00	70	22,00
MS12400140*	14,00	14,00	80	25,00
MS12400160*	16,00	16,00	80	25,00
MS12400180*	18,00	18,00	100	30,00
MS12400200*	20,00	20,00	100	35,00

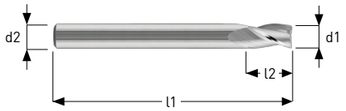
*** Disponibili su richiesta, minimo 5 pz**
* Available on request, minimum qty 5 pcs
* Verfügbar auf Anfrag, mindestmenge 5 Stk
* Disponible sur demande, au moins 5 pièces

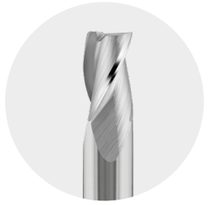
Parametri | Working parameters | Richtswerte | Paramètres | **156**

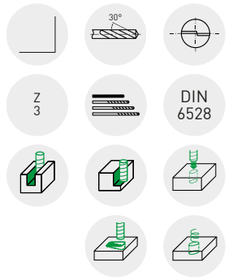
Notes

MS131

Fresa elicoidale - serie corta
Twist cutter - short series
Spiralfräser - kurze Serie
Fraise hélicoïdal - série courte







P M K

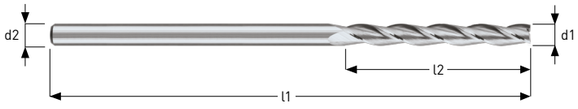
Art. Tusa Precision	d1 h11	d2 h6	l1 +1/0	l2 +1/0
MS13100020	2,00	2,00	42	6,0
MS13100025	2,50	2,50	42	7,0
MS13100030	3,00	3,00	45	7,0
MS13100035	3,50	3,50	50	7,0
MS13100040	4,00	4,00	50	8,0
MS13100045	4,50	4,50	50	8,0
MS13100050	5,00	5,00	50	10,0
MS13100055	5,50	5,50	57	10,0
MS13100060	6,00	6,00	57	10,0
MS13100070	7,00	7,00	60	13,0
MS13100080	8,00	8,00	63	16,0
MS13100090	9,00	9,00	67	16,0
MS13100100	10,00	10,00	72	19,0
MS13100110*	11,00	11,00	83	22,0
MS13100120*	12,00	12,00	83	22,0
MS13100130*	13,00	13,00	83	22,0
MS13100140*	14,00	14,00	83	22,0
MS13100150*	15,00	15,00	92	26,0
MS13100160*	16,00	16,00	92	26,0
MS13100180*	18,00	18,00	92	26,0
MS13100200*	20,00	20,00	101	32,0

*** Disponibili su richiesta, minimo 5 pz**
* Available on request, minimum qty 5 pcs
* Verfügbar auf Anfrag, mindestmenge 5 Stk
* Disponible sur demande, au moins 5 pièces

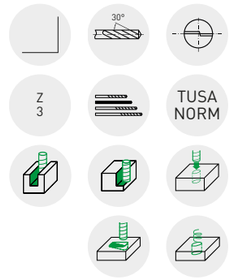
Parametri | Working parameters | Richtswerte | Paramètres | **157**

MS131XL

Fresa elicoidale - serie media
Twist cutter - medium series
Spiralfräser - mittelere Serie
Fraise hélicoïdal - série moyenne





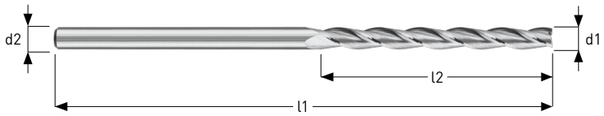


P M K

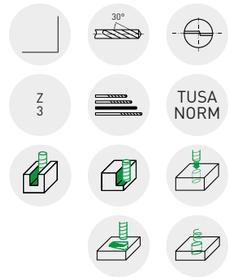
Art. Tusa Precision	d1 h11	d2 h6	l1 +1/0	l2 +1/0
MS131L0030	3,00	3,00	55	20,00
MS131L0040	4,00	4,00	60	20,00
MS131L0050	5,00	5,00	60	20,00
MS131L0060	6,00	6,00	65	24,00
MS131L0080	8,00	8,00	80	32,00
MS131L0100	10,00	10,00	80	32,00
MS131L0120*	12,00	12,00	100	50,00
MS131L0140*	14,00	14,00	100	50,00
MS131L0160*	16,00	16,00	100	50,00
MS131L0180*	18,00	18,00	100	50,00
MS131L0200*	20,00	20,00	100	50,00

MS131XLS

Fresa elicoidale - serie lunga
Twist cutter - long series
Spiralfräser - lange Serie
Fraise hélicoïdal - série longue







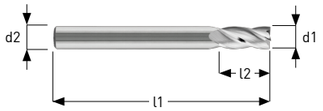
P M K

Art. Tusa Precision	d1 h11	d2 h6	l1 +1/0	l2 +1/0
MS131S0040	4,00	4,00	75	40,00
MS131S0050	5,00	5,00	80	40,00
MS131S0060	6,00	6,00	80	45,00
MS131S0080	8,00	8,00	100	50,00
MS131S0100	10,00	10,00	100	50,00
MS131S0120*	12,00	12,00	150	70,00
MS131S0140*	14,00	14,00	150	75,00
MS131S0160*	16,00	16,00	150	75,00
MS131S0180*	18,00	18,00	150	75,00
MS131S0200*	20,00	20,00	150	75,00

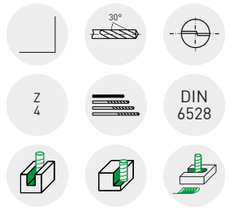
Parametri | Working parameters | Richtswerte | Paramètres | **158 - 159**

MS141

Fresa elicoidale - serie corta
Twist cutter - short series
Spiralfräser - kurze Serie
Fraise hélicoïdal - série courte







P M K

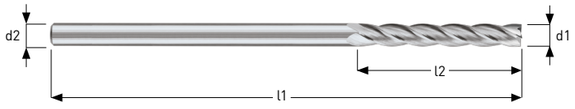
Art. Tusa Precision	d1 h11	d2 h6	l1 +1/0	l2 +1/0
MS14100020	2,00	2,00	42	7,0
MS14100025	2,50	2,50	42	8,0
MS14100030	3,00	3,00	45	8,0
MS14100035	3,50	3,50	50	10,0
MS14100040	4,00	4,00	50	11,0
MS14100045	4,50	4,50	50	11,0
MS14100050	5,00	5,00	50	13,0
MS14100055	5,50	5,50	57	13,0
MS14100060	6,00	6,00	57	13,0
MS14100065	6,50	6,50	60	16,0
MS14100070	7,00	7,00	60	16,0
MS14100075	7,50	7,50	63	19,0
MS14100080	8,00	8,00	63	19,0
MS14100085	8,50	8,50	67	19,0
MS14100090	9,00	9,00	67	19,0
MS14100095	9,50	9,50	72	22,0
MS14100100	10,00	10,00	72	22,0
MS14100110*	11,00	11,00	83	26,0
MS14100120*	12,00	12,00	83	26,0
MS14100130*	13,00	13,00	83	26,0
MS14100140*	14,00	14,00	83	26,0
MS14100150*	15,00	15,00	92	32,0
MS14100160*	16,00	16,00	92	32,0
MS14100180*	18,00	18,00	92	32,0
MS14100200*	20,00	20,00	101	38,0

*** Disponibili su richiesta, minimo 5 pz**
* Available on request, minimum qty 5 pcs
* Verfügbar auf Anfrag, mindestmenge 5 Stk
* Disponible sur demande, au moins 5 pièces

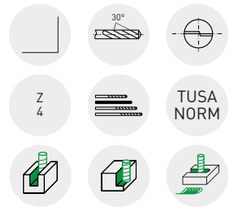
Parametri | Working parameters | Richtswerte | Paramètres | **160**

MS141XL

Fresa elicoidale - serie media
Twist cutter - medium series
Spiralfräser - mittelere Serie
Fraise hélicoïdal - série moyenne





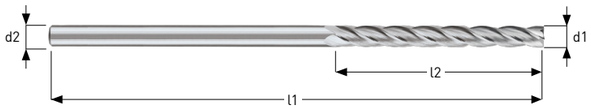


P M K

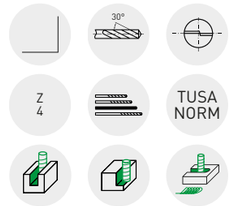
Art. Tusa Precision	d1 h6	d2 h6	l1 +/-1	l2 +/-0.2
MS141L0030	3,00	3,00	55	20,00
MS141L0040	4,00	4,00	60	20,00
MS141L0050	5,00	5,00	60	20,00
MS141L0060	6,00	6,00	65	24,00
MS141L0080	8,00	8,00	80	32,00
MS141L0100	10,00	10,00	80	32,00
MS141L0120*	12,00	12,00	100	50,00
MS141L0140*	14,00	14,00	100	50,00
MS141L0160*	16,00	16,00	100	50,00
MS141L0180*	18,00	18,00	100	50,00
MS141L0200*	20,00	20,00	100	50,00

MS141XLS

Fresa elicoidale - serie lunga
Twist cutter - long series
Spiralfräser - lange Serie
Fraise hélicoïdal - série longue







P M K

Art. Tusa Precision	d1 h6	d2 h6	l1 +/-1	l2 +/-0.2
MS141S0040	4,00	4,00	75	40,00
MS141S0050	5,00	5,00	80	40,00
MS141S0060	6,00	6,00	80	45,00
MS141S0080	8,00	8,00	100	50,00
MS141S0100	10,00	10,00	100	50,00
MS141S0120*	12,00	12,00	150	70,00
MS141S0140*	14,00	14,00	150	75,00
MS141S0160*	16,00	16,00	150	75,00
MS141S0180*	18,00	18,00	150	75,00
MS141S0200*	20,00	20,00	150	75,00

Parametri | Working parameters | Richtswerte | Paramètres | **161 - 162**

MS122

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocitàdi taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 2.00-3.50	Ø 4.00-5.50	Ø 6.00-9.00	Ø 10.00-14.00	Ø 16.00-20.00
P00	●	160-200	0.012-0.021	0.024-0.033	0.036-0.054	0.06-0.084	0.096-0.12
P01	●	160-200	0.012-0.021	0.024-0.033	0.036-0.054	0.06-0.084	0.096-0.12
P02	●	140-180	0.012-0.021	0.024-0.033	0.036-0.054	0.06-0.084	0.096-0.12
P03	●	100-140	0.012-0.021	0.024-0.033	0.036-0.054	0.06-0.084	0.096-0.12
P04	●	80-120	0.012-0.021	0.024-0.033	0.036-0.054	0.06-0.084	0.096-0.12
P05	◑	60-100	0.012-0.021	0.024-0.033	0.036-0.054	0.06-0.084	0.096-0.12
P06	◑	60-80	0.012-0.021	0.024-0.033	0.036-0.054	0.06-0.084	0.096-0.12
M01	◑	80-120	0.012-0.021	0.024-0.033	0.036-0.054	0.06-0.084	0.096-0.12
M02	◑	60-100	0.012-0.021	0.024-0.033	0.036-0.054	0.06-0.084	0.096-0.12
M03	◑	40-80	0.012-0.021	0.024-0.033	0.036-0.054	0.06-0.084	0.096-0.12
K01	◑	140-180	0.012-0.021	0.024-0.033	0.036-0.054	0.06-0.084	0.096-0.12
K03	◑	100-140	0.012-0.021	0.024-0.033	0.036-0.054	0.06-0.084	0.096-0.12
K02	◑	80-120	0.012-0.021	0.024-0.033	0.036-0.054	0.06-0.084	0.096-0.12
N01	○	-	-	-	-	-	-
N02	○	-	-	-	-	-	-
N03	○	-	-	-	-	-	-
N04	○	-	-	-	-	-	-
S01	○	-	-	-	-	-	-
S02	○	-	-	-	-	-	-
S03	○	-	-	-	-	-	-
S04	○	-	-	-	-	-	-
H01	○	-	-	-	-	-	-
H02	○	-	-	-	-	-	-
H03	○	-	-	-	-	-	-
O01	○	-	-	-	-	-	-
O02	○	-	-	-	-	-	-
O03	○	-	-	-	-	-	-
O04	○	-	-	-	-	-	-
O05	○	-	-	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

MS122XL

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocitàdi taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 3.00-5.00	Ø 6.00-10.00	Ø 12.00-16.00	Ø 18.00-20.00
P00	●	160-200	0.013-0.021	0.025-0.042	0.050-0.067	0.075-0.084
P01	●	160-200	0.013-0.021	0.025-0.042	0.050-0.067	0.075-0.084
P02	●	140-180	0.013-0.021	0.025-0.042	0.050-0.067	0.075-0.084
P03	●	100-140	0.013-0.021	0.025-0.042	0.050-0.067	0.075-0.084
P04	●	80-120	0.013-0.021	0.025-0.042	0.050-0.067	0.075-0.084
P05	◑	60-100	0.013-0.021	0.025-0.042	0.050-0.067	0.075-0.084
P06	◑	60-80	0.013-0.021	0.025-0.042	0.050-0.067	0.075-0.084
M01	◑	80-120	0.013-0.021	0.025-0.042	0.050-0.067	0.075-0.084
M02	◑	60-100	0.013-0.021	0.025-0.042	0.050-0.067	0.075-0.084
M03	◑	40-80	0.013-0.021	0.025-0.042	0.050-0.067	0.075-0.084
K01	◑	140-180	0.013-0.021	0.025-0.042	0.050-0.067	0.075-0.084
K03	◑	100-140	0.013-0.021	0.025-0.042	0.050-0.067	0.075-0.084
K02	◑	80-120	0.013-0.021	0.025-0.042	0.050-0.067	0.075-0.084
N01	○	-	-	-	-	-
N02	○	-	-	-	-	-
N03	○	-	-	-	-	-
N04	○	-	-	-	-	-
S01	○	-	-	-	-	-
S02	○	-	-	-	-	-
S03	○	-	-	-	-	-
S04	○	-	-	-	-	-
H01	○	-	-	-	-	-
H02	○	-	-	-	-	-
H03	○	-	-	-	-	-
O01	○	-	-	-	-	-
O02	○	-	-	-	-	-
O03	○	-	-	-	-	-
O04	○	-	-	-	-	-
O05	○	-	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

MS122XLS

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocitàdi taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 4.00-6.00	Ø 8.00-14.00	Ø 16.00-20.00
P00	●	160-200	0.013-0.020	0.027-0.040	0.052-0.066
P01	●	160-200	0.013-0.020	0.027-0.040	0.052-0.066
P02	●	140-180	0.013-0.020	0.027-0.040	0.052-0.066
P03	●	100-140	0.013-0.020	0.027-0.040	0.052-0.066
P04	●	80-120	0.013-0.020	0.027-0.040	0.052-0.066
P05	◑	60-100	0.013-0.020	0.027-0.040	0.052-0.066
P06	◑	60-80	0.013-0.020	0.027-0.040	0.052-0.066
M01	◑	80-120	0.013-0.020	0.027-0.040	0.052-0.066
M02	◑	60-100	0.013-0.020	0.027-0.040	0.052-0.066
M03	◑	40-80	0.013-0.020	0.027-0.040	0.052-0.066
K01	◑	140-180	0.013-0.020	0.027-0.040	0.052-0.066
K03	◑	100-140	0.013-0.020	0.027-0.040	0.052-0.066
K02	◑	80-120	0.013-0.020	0.027-0.040	0.052-0.066
N01	○	-	-	-	-
N02	○	-	-	-	-
N03	○	-	-	-	-
N04	○	-	-	-	-
S01	○	-	-	-	-
S02	○	-	-	-	-
S03	○	-	-	-	-
S04	○	-	-	-	-
H01	○	-	-	-	-
H02	○	-	-	-	-
H03	○	-	-	-	-
O01	○	-	-	-	-
O02	○	-	-	-	-
O03	○	-	-	-	-
O04	○	-	-	-	-
O05	○	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

MS123

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocitàdi taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 2.00-3.00	Ø 4.00-6.00	Ø 7.00-9.00	Ø 10.00-12.00	Ø 14.00-16.00	Ø 18.00-20.00
P00	●	160-200	0.060-0.090	0.12-0.18	0.208-0.263	0.288-0.334	0.374-0.404	0.424-0.432
P01	●	160-200	0.060-0.090	0.12-0.18	0.208-0.263	0.288-0.334	0.374-0.404	0.424-0.432
P02	●	140-180	0.060-0.090	0.12-0.18	0.208-0.263	0.288-0.334	0.374-0.404	0.424-0.432
P03	●	100-140	0.060-0.090	0.12-0.18	0.208-0.263	0.288-0.334	0.374-0.404	0.424-0.432
P04	●	80-120	0.060-0.090	0.12-0.18	0.208-0.263	0.288-0.334	0.374-0.404	0.424-0.432
P05	◑	60-100	0.060-0.090	0.12-0.18	0.208-0.263	0.288-0.334	0.374-0.404	0.424-0.432
P06	◑	60-80	0.060-0.090	0.12-0.18	0.208-0.263	0.288-0.334	0.374-0.404	0.424-0.432
M01	◑	80-120	0.060-0.090	0.12-0.18	0.208-0.263	0.288-0.334	0.374-0.404	0.424-0.432
M02	◑	60-100	0.060-0.090	0.12-0.18	0.208-0.263	0.288-0.334	0.374-0.404	0.424-0.432
M03	◑	40-80	0.060-0.090	0.12-0.18	0.208-0.263	0.288-0.334	0.374-0.404	0.424-0.432
K01	◑	140-180	0.060-0.090	0.12-0.18	0.208-0.263	0.288-0.334	0.374-0.404	0.424-0.432
K03	◑	100-140	0.060-0.090	0.12-0.18	0.208-0.263	0.288-0.334	0.374-0.404	0.424-0.432
K02	◑	80-120	0.060-0.090	0.12-0.18	0.208-0.263	0.288-0.334	0.374-0.404	0.424-0.432
N01	○	-	-	-	-	-	-	-
N02	○	-	-	-	-	-	-	-
N03	○	-	-	-	-	-	-	-
N04	○	-	-	-	-	-	-	-
S01	○	-	-	-	-	-	-	-
S02	○	-	-	-	-	-	-	-
S03	○	-	-	-	-	-	-	-
S04	○	-	-	-	-	-	-	-
H01	○	-	-	-	-	-	-	-
H02	○	-	-	-	-	-	-	-
H03	○	-	-	-	-	-	-	-
O01	○	-	-	-	-	-	-	-
O02	○	-	-	-	-	-	-	-
O03	○	-	-	-	-	-	-	-
O04	○	-	-	-	-	-	-	-
O05	○	-	-	-	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

MS123XL

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocitàdi taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 3.00-5.00	Ø 6.00-8.00	Ø 10.00-12.00	Ø 14.00-20.00
P00	●	160-200	0.072-0.12	0.143-0.188	0.23-0.267	0.30-0.345
P01	●	160-200	0.072-0.12	0.143-0.188	0.23-0.267	0.30-0.345
P02	●	140-180	0.072-0.12	0.143-0.188	0.23-0.267	0.30-0.345
P03	●	100-140	0.072-0.12	0.143-0.188	0.23-0.267	0.30-0.345
P04	●	80-120	0.072-0.12	0.143-0.188	0.23-0.267	0.30-0.345
P05	◑	60-100	0.072-0.12	0.143-0.188	0.23-0.267	0.30-0.345
P06	◑	60-80	0.072-0.12	0.143-0.188	0.23-0.267	0.30-0.345
M01	◑	80-120	0.072-0.12	0.143-0.188	0.23-0.267	0.30-0.345
M02	◑	60-100	0.072-0.12	0.143-0.188	0.23-0.267	0.30-0.345
M03	◑	40-80	0.072-0.12	0.143-0.188	0.23-0.267	0.30-0.345
K01	◑	140-180	0.072-0.12	0.143-0.188	0.23-0.267	0.30-0.345
K03	◑	100-140	0.072-0.12	0.143-0.188	0.23-0.267	0.30-0.345
K02	◑	80-120	0.072-0.12	0.143-0.188	0.23-0.267	0.30-0.345
N01	○	-	-	-	-	-
N02	○	-	-	-	-	-
N03	○	-	-	-	-	-
N04	○	-	-	-	-	-
S01	○	-	-	-	-	-
S02	○	-	-	-	-	-
S03	○	-	-	-	-	-
S04	○	-	-	-	-	-
H01	○	-	-	-	-	-
H02	○	-	-	-	-	-
H03	○	-	-	-	-	-
O01	○	-	-	-	-	-
O02	○	-	-	-	-	-
O03	○	-	-	-	-	-
O04	○	-	-	-	-	-
O05	○	-	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

Made in Switzerland

MS123XLS

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocitàdi taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 4.00-5.00	Ø 6.00-8.00	Ø 10.00-12.00	Ø 14.00-16.00	Ø 20.00
P00	●	160-200	0.084-0.105	0.125-0.165	0.201-0.233	0.261-0.282	0.302
P01	●	160-200	0.084-0.105	0.125-0.165	0.201-0.233	0.261-0.282	0.302
P02	●	140-180	0.084-0.105	0.125-0.165	0.201-0.233	0.261-0.282	0.302
P03	●	100-140	0.084-0.105	0.125-0.165	0.201-0.233	0.261-0.282	0.302
P04	●	80-120	0.084-0.105	0.125-0.165	0.201-0.233	0.261-0.282	0.302
P05	◑	60-100	0.084-0.105	0.125-0.165	0.201-0.233	0.261-0.282	0.302
P06	◑	60-80	0.084-0.105	0.125-0.165	0.201-0.233	0.261-0.282	0.302
M01	◑	80-120	0.084-0.105	0.125-0.165	0.201-0.233	0.261-0.282	0.302
M02	◑	60-100	0.084-0.105	0.125-0.165	0.201-0.233	0.261-0.282	0.302
M03	◑	40-80	0.084-0.105	0.125-0.165	0.201-0.233	0.261-0.282	0.302
K01	◑	140-180	0.084-0.105	0.125-0.165	0.201-0.233	0.261-0.282	0.302
K03	◑	100-140	0.084-0.105	0.125-0.165	0.201-0.233	0.261-0.282	0.302
K02	◑	80-120	0.084-0.105	0.125-0.165	0.201-0.233	0.261-0.282	0.302
N01	○	-	-	-	-	-	-
N02	○	-	-	-	-	-	-
N03	○	-	-	-	-	-	-
N04	○	-	-	-	-	-	-
S01	○	-	-	-	-	-	-
S02	○	-	-	-	-	-	-
S03	○	-	-	-	-	-	-
S04	○	-	-	-	-	-	-
H01	○	-	-	-	-	-	-
H02	○	-	-	-	-	-	-
H03	○	-	-	-	-	-	-
O01	○	-	-	-	-	-	-
O02	○	-	-	-	-	-	-
O03	○	-	-	-	-	-	-
O04	○	-	-	-	-	-	-
O05	○	-	-	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

MS124

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocitàdi taglio Cutting Speed	Avanzamento mm/giro Cutting Feed mm/rev					
		m/min	Ø 2.00-3.00	Ø 4.00-5.00	Ø 6.00-8.00	Ø 9.00-10.00	Ø 12.00-14.00	Ø 16.00-20.00
P00	○	-	-	-	-	-	-	-
P01	○	-	-	-	-	-	-	-
P02	○	-	-	-	-	-	-	-
P03	○	-	-	-	-	-	-	-
P04	○	-	-	-	-	-	-	-
P05	○	-	-	-	-	-	-	-
P06	○	-	-	-	-	-	-	-
M01	○	-	-	-	-	-	-	-
M02	○	-	-	-	-	-	-	-
M03	○	-	-	-	-	-	-	-
K01	○	-	-	-	-	-	-	-
K03	○	-	-	-	-	-	-	-
K02	○	-	-	-	-	-	-	-
N01	●	200-400	0.007-0.011	0.02-0.025	0.030-0.040	0.030-0.040	0.07-0.085	0.096-0.12
N02	●	200-400	0.007-0.011	0.02-0.025	0.030-0.040	0.030-0.040	0.07-0.085	0.096-0.12
N03	●	160-200	0.007-0.011	0.02-0.025	0.030-0.040	0.030-0.040	0.07-0.085	0.096-0.12
N04	●	160-200	0.007-0.011	0.02-0.025	0.030-0.040	0.030-0.040	0.07-0.085	0.096-0.12
S01	○	-	-	-	-	-	-	-
S02	○	-	-	-	-	-	-	-
S03	○	-	-	-	-	-	-	-
S04	○	-	-	-	-	-	-	-
H01	○	-	-	-	-	-	-	-
H02	○	-	-	-	-	-	-	-
H03	○	-	-	-	-	-	-	-
O01	●	200-400	0.007-0.011	0.02-0.025	0.030-0.040	0.030-0.040	0.07-0.085	0.096-0.12
O02	○	-	-	-	-	-	-	-
O03	○	-	-	-	-	-	-	-
O04	○	-	-	-	-	-	-	-
O05	○	-	-	-	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

MS131

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocitàdi taglio Cutting Speed	Avanzamento mm/giro Cutting Feed mm/rev							
		m/min	Ø 2.00-3.00	Ø 3.50-4.50	Ø 5.00-6.00	Ø 7.00-9.00	Ø 10.00-12.00	Ø 13.00-14.00	Ø 15.00-16.00	Ø 18.00-20.00
P00	●	160-200	0.011-0.016	0.019-0.024	0.027-0.033	0.038-0.050	0.055-0.066	0.071-0.077	0.082-0.088	0.099-0.11
P01	●	160-200	0.011-0.016	0.019-0.024	0.027-0.033	0.038-0.050	0.055-0.066	0.071-0.077	0.082-0.088	0.099-0.11
P02	●	140-180	0.011-0.016	0.019-0.024	0.027-0.033	0.038-0.050	0.055-0.066	0.071-0.077	0.082-0.088	0.099-0.11
P03	●	100-140	0.011-0.016	0.019-0.024	0.027-0.033	0.038-0.050	0.055-0.066	0.071-0.077	0.082-0.088	0.099-0.11
P04	●	80-120	0.011-0.016	0.019-0.024	0.027-0.033	0.038-0.050	0.055-0.066	0.071-0.077	0.082-0.088	0.099-0.11
P05	◑	60-100	0.011-0.016	0.019-0.024	0.027-0.033	0.038-0.050	0.055-0.066	0.071-0.077	0.082-0.088	0.099-0.11
P06	◑	60-80	0.011-0.016	0.019-0.024	0.027-0.033	0.038-0.050	0.055-0.066	0.071-0.077	0.082-0.088	0.099-0.11
M01	◑	80-120	0.011-0.016	0.019-0.024	0.027-0.033	0.038-0.050	0.055-0.066	0.071-0.077	0.082-0.088	0.099-0.11
M02	◑	60-100	0.011-0.016	0.019-0.024	0.027-0.033	0.038-0.050	0.055-0.066	0.071-0.077	0.082-0.088	0.099-0.11
M03	◑	40-80	0.011-0.016	0.019-0.024	0.027-0.033	0.038-0.050	0.055-0.066	0.071-0.077	0.082-0.088	0.099-0.11
K01	◑	140-180	0.011-0.016	0.019-0.024	0.027-0.033	0.038-0.050	0.055-0.066	0.071-0.077	0.082-0.088	0.099-0.11
K03	◑	100-140	0.011-0.016	0.019-0.024	0.027-0.033	0.038-0.050	0.055-0.066	0.071-0.077	0.082-0.088	0.099-0.11
K02	◑	80-120	0.011-0.016	0.019-0.024	0.027-0.033	0.038-0.050	0.055-0.066	0.071-0.077	0.082-0.088	0.099-0.11
N01	○	-	-	-	-	-	-	-	-	-
N02	○	-	-	-	-	-	-	-	-	-
N03	○	-	-	-	-	-	-	-	-	-
N04	○	-	-	-	-	-	-	-	-	-
S01	○	-	-	-	-	-	-	-	-	-
S02	○	-	-	-	-	-	-	-	-	-
S03	○	-	-	-	-	-	-	-	-	-
S04	○	-	-	-	-	-	-	-	-	-
H01	○	-	-	-	-	-	-	-	-	-
H02	○	-	-	-	-	-	-	-	-	-
H03	○	-	-	-	-	-	-	-	-	-
O01	○	-	-	-	-	-	-	-	-	-
O02	○	-	-	-	-	-	-	-	-	-
O03	○	-	-	-	-	-	-	-	-	-
O04	○	-	-	-	-	-	-	-	-	-
O05	○	-	-	-	-	-	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

MS131XL

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocitàdi taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 3.00-4.00	Ø 5.00-6.00	Ø 8.00-10.00	Ø 12.00-14.00	Ø 16.00-20.00
P00	●	160-200	0.016-0.022	0.027-0.033	0.044-0.055	0.066-0.077	0.088-0.10
P01	●	160-200	0.016-0.022	0.027-0.033	0.044-0.055	0.066-0.077	0.088-0.10
P02	●	140-180	0.016-0.022	0.027-0.033	0.044-0.055	0.066-0.077	0.088-0.10
P03	●	100-140	0.016-0.022	0.027-0.033	0.044-0.055	0.066-0.077	0.088-0.10
P04	●	80-120	0.016-0.022	0.027-0.033	0.044-0.055	0.066-0.077	0.088-0.10
P05	◑	60-100	0.016-0.022	0.027-0.033	0.044-0.055	0.066-0.077	0.088-0.10
P06	◑	60-80	0.016-0.022	0.027-0.033	0.044-0.055	0.066-0.077	0.088-0.10
M01	◑	80-120	0.016-0.022	0.027-0.033	0.044-0.055	0.066-0.077	0.088-0.10
M02	◑	60-100	0.016-0.022	0.027-0.033	0.044-0.055	0.066-0.077	0.088-0.10
M03	◑	40-80	0.016-0.022	0.027-0.033	0.044-0.055	0.066-0.077	0.088-0.10
K01	◑	140-180	0.016-0.022	0.027-0.033	0.044-0.055	0.066-0.077	0.088-0.10
K03	◑	100-140	0.016-0.022	0.027-0.033	0.044-0.055	0.066-0.077	0.088-0.10
K02	◑	80-120	0.016-0.022	0.027-0.033	0.044-0.055	0.066-0.077	0.088-0.10
N01	○	-	-	-	-	-	-
N02	○	-	-	-	-	-	-
N03	○	-	-	-	-	-	-
N04	○	-	-	-	-	-	-
S01	○	-	-	-	-	-	-
S02	○	-	-	-	-	-	-
S03	○	-	-	-	-	-	-
S04	○	-	-	-	-	-	-
H01	○	-	-	-	-	-	-
H02	○	-	-	-	-	-	-
H03	○	-	-	-	-	-	-
O01	○	-	-	-	-	-	-
O02	○	-	-	-	-	-	-
O03	○	-	-	-	-	-	-
O04	○	-	-	-	-	-	-
O05	○	-	-	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

MS131XLS

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocitàdi taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 4.00-6.00	Ø 8.00-12.00	Ø 14.00-16.00	Ø 18.00-20.00
P00	●	160-200	0.022-0.033	0.044-0.066	0.077-0.088	0.099-0.11
P01	●	160-200	0.022-0.033	0.044-0.066	0.077-0.088	0.099-0.11
P02	●	140-180	0.022-0.033	0.044-0.066	0.077-0.088	0.099-0.11
P03	●	100-140	0.022-0.033	0.044-0.066	0.077-0.088	0.099-0.11
P04	●	80-120	0.022-0.033	0.044-0.066	0.077-0.088	0.099-0.11
P05	◑	60-100	0.022-0.033	0.044-0.066	0.077-0.088	0.099-0.11
P06	◑	60-80	0.022-0.033	0.044-0.066	0.077-0.088	0.099-0.11
M01	◑	80-120	0.022-0.033	0.044-0.066	0.077-0.088	0.099-0.11
M02	◑	60-100	0.022-0.033	0.044-0.066	0.077-0.088	0.099-0.11
M03	◑	40-80	0.022-0.033	0.044-0.066	0.077-0.088	0.099-0.11
K01	◑	140-180	0.022-0.033	0.044-0.066	0.077-0.088	0.099-0.11
K03	◑	100-140	0.022-0.033	0.044-0.066	0.077-0.088	0.099-0.11
K02	◑	80-120	0.022-0.033	0.044-0.066	0.077-0.088	0.099-0.11
N01	○	-	-	-	-	-
N02	○	-	-	-	-	-
N03	○	-	-	-	-	-
N04	○	-	-	-	-	-
S01	○	-	-	-	-	-
S02	○	-	-	-	-	-
S03	○	-	-	-	-	-
S04	○	-	-	-	-	-
H01	○	-	-	-	-	-
H02	○	-	-	-	-	-
H03	○	-	-	-	-	-
O01	○	-	-	-	-	-
O02	○	-	-	-	-	-
O03	○	-	-	-	-	-
O04	○	-	-	-	-	-
O05	○	-	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

MS141

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocitàdi taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 2.00-3.00	Ø 3.50-4.50	Ø 5.00-6.00	Ø 6.50-7.50	Ø 8.00-9.50	Ø 10.00-12.00	Ø 13.00-15.00	Ø 16.00-20.00
P00	●	160-200	0.01-0.015	0.017-0.022	0.025-0.030	0.032-0.037	0.04-0.047	0.05-0.06	0.065-0.075	0.08-0.1
P01	●	160-200	0.01-0.015	0.017-0.022	0.025-0.030	0.032-0.037	0.04-0.047	0.05-0.06	0.065-0.075	0.08-0.1
P02	●	140-180	0.01-0.015	0.017-0.022	0.025-0.030	0.032-0.037	0.04-0.047	0.05-0.06	0.065-0.075	0.08-0.1
P03	●	100-140	0.01-0.015	0.017-0.022	0.025-0.030	0.032-0.037	0.04-0.047	0.05-0.06	0.065-0.075	0.08-0.1
P04	●	80-120	0.01-0.015	0.017-0.022	0.025-0.030	0.032-0.037	0.04-0.047	0.05-0.06	0.065-0.075	0.08-0.1
P05	◑	60-100	0.01-0.015	0.017-0.022	0.025-0.030	0.032-0.037	0.04-0.047	0.05-0.06	0.065-0.075	0.08-0.1
P06	◑	60-80	0.01-0.015	0.017-0.022	0.025-0.030	0.032-0.037	0.04-0.047	0.05-0.06	0.065-0.075	0.08-0.1
M01	◑	80-120	0.01-0.015	0.017-0.022	0.025-0.030	0.032-0.037	0.04-0.047	0.05-0.06	0.065-0.075	0.08-0.1
M02	◑	60-100	0.01-0.015	0.017-0.022	0.025-0.030	0.032-0.037	0.04-0.047	0.05-0.06	0.065-0.075	0.08-0.1
M03	◑	40-80	0.01-0.015	0.017-0.022	0.025-0.030	0.032-0.037	0.04-0.047	0.05-0.06	0.065-0.075	0.08-0.1
K01	◑	140-180	0.01-0.015	0.017-0.022	0.025-0.030	0.032-0.037	0.04-0.047	0.05-0.06	0.065-0.075	0.08-0.1
K03	◑	100-140	0.01-0.015	0.017-0.022	0.025-0.030	0.032-0.037	0.04-0.047	0.05-0.06	0.065-0.075	0.08-0.1
K02	◑	80-120	0.01-0.015	0.017-0.022	0.025-0.030	0.032-0.037	0.04-0.047	0.05-0.06	0.065-0.075	0.08-0.1
N01	○	-	-	-	-	-	-	-	-	-
N02	○	-	-	-	-	-	-	-	-	-
N03	○	-	-	-	-	-	-	-	-	-
N04	○	-	-	-	-	-	-	-	-	-
S01	○	-	-	-	-	-	-	-	-	-
S02	○	-	-	-	-	-	-	-	-	-
S03	○	-	-	-	-	-	-	-	-	-
S04	○	-	-	-	-	-	-	-	-	-
H01	○	-	-	-	-	-	-	-	-	-
H02	○	-	-	-	-	-	-	-	-	-
H03	○	-	-	-	-	-	-	-	-	-
O01	○	-	-	-	-	-	-	-	-	-
O02	○	-	-	-	-	-	-	-	-	-
O03	○	-	-	-	-	-	-	-	-	-
O04	○	-	-	-	-	-	-	-	-	-
O05	○	-	-	-	-	-	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

MS141XL

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocitàdi taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 3.00-5.00	Ø 6.00-8.00	Ø 10.00-12.00	Ø 14.00-16.00	Ø 14.00-16.00
P00	●	160-200	0.01-0.017	0.021-0.028	0.035-0.042	0.050-0.056	0.063-0.07
P01	●	160-200	0.01-0.017	0.021-0.028	0.035-0.042	0.050-0.056	0.063-0.07
P02	●	140-180	0.01-0.017	0.021-0.028	0.035-0.042	0.050-0.056	0.063-0.07
P03	●	100-140	0.01-0.017	0.021-0.028	0.035-0.042	0.050-0.056	0.063-0.07
P04	●	80-120	0.01-0.017	0.021-0.028	0.035-0.042	0.050-0.056	0.063-0.07
P05	◑	60-100	0.01-0.017	0.021-0.028	0.035-0.042	0.050-0.056	0.063-0.07
P06	◑	60-80	0.01-0.017	0.021-0.028	0.035-0.042	0.050-0.056	0.063-0.07
M01	◑	80-120	0.01-0.017	0.021-0.028	0.035-0.042	0.050-0.056	0.063-0.07
M02	◑	60-100	0.01-0.017	0.021-0.028	0.035-0.042	0.050-0.056	0.063-0.07
M03	◑	40-80	0.01-0.017	0.021-0.028	0.035-0.042	0.050-0.056	0.063-0.07
K01	◑	140-180	0.01-0.017	0.021-0.028	0.035-0.042	0.050-0.056	0.063-0.07
K03	◑	100-140	0.01-0.017	0.021-0.028	0.035-0.042	0.050-0.056	0.063-0.07
K02	◑	80-120	0.01-0.017	0.021-0.028	0.035-0.042	0.050-0.056	0.063-0.07
N01	○	-	-	-	-	-	-
N02	○	-	-	-	-	-	-
N03	○	-	-	-	-	-	-
N04	○	-	-	-	-	-	-
S01	○	-	-	-	-	-	-
S02	○	-	-	-	-	-	-
S03	○	-	-	-	-	-	-
S04	○	-	-	-	-	-	-
H01	○	-	-	-	-	-	-
H02	○	-	-	-	-	-	-
H03	○	-	-	-	-	-	-
O01	○	-	-	-	-	-	-
O02	○	-	-	-	-	-	-
O03	○	-	-	-	-	-	-
O04	○	-	-	-	-	-	-
O05	○	-	-	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

MS141XLS

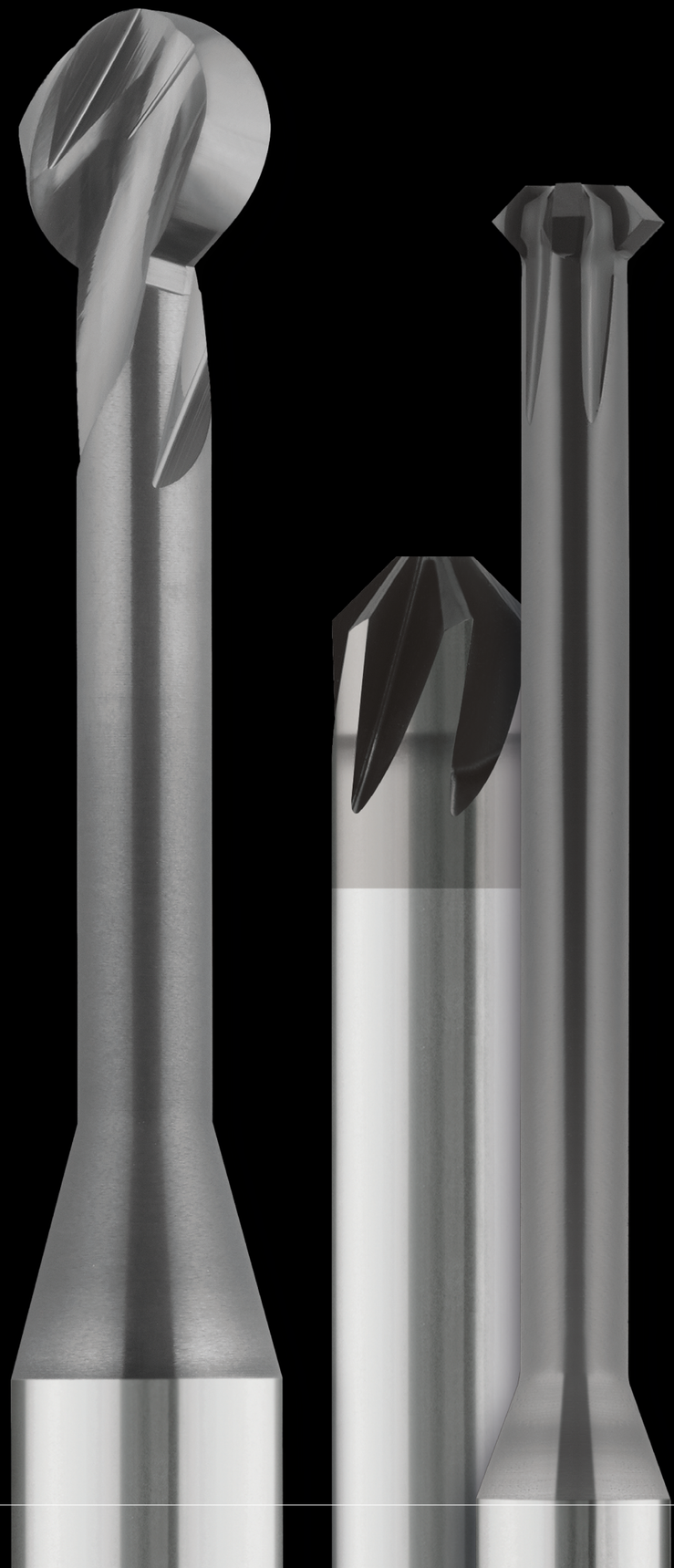
Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocitàdi taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 4.00-6.00	Ø 8.00-12.00	Ø 14.00-16.00	Ø 18.00-20.00
P00	●	160-200	0.011-0.016	0.022-0.033	0.038-0.044	0.05-0.055
P01	●	160-200	0.011-0.016	0.022-0.033	0.038-0.044	0.05-0.055
P02	●	140-180	0.011-0.016	0.022-0.033	0.038-0.044	0.05-0.055
P03	●	100-140	0.011-0.016	0.022-0.033	0.038-0.044	0.05-0.055
P04	●	80-120	0.011-0.016	0.022-0.033	0.038-0.044	0.05-0.055
P05	◑	60-100	0.011-0.016	0.022-0.033	0.038-0.044	0.05-0.055
P06	◑	60-80	0.011-0.016	0.022-0.033	0.038-0.044	0.05-0.055
M01	◑	80-120	0.011-0.016	0.022-0.033	0.038-0.044	0.05-0.055
M02	◑	60-100	0.011-0.016	0.022-0.033	0.038-0.044	0.05-0.055
M03	◑	40-80	0.011-0.016	0.022-0.033	0.038-0.044	0.05-0.055
K01	◑	140-180	0.011-0.016	0.022-0.033	0.038-0.044	0.05-0.055
K03	◑	100-140	0.011-0.016	0.022-0.033	0.038-0.044	0.05-0.055
K02	◑	80-120	0.011-0.016	0.022-0.033	0.038-0.044	0.05-0.055
N01	○	-	-	-	-	-
N02	○	-	-	-	-	-
N03	○	-	-	-	-	-
N04	○	-	-	-	-	-
S01	○	-	-	-	-	-
S02	○	-	-	-	-	-
S03	○	-	-	-	-	-
S04	○	-	-	-	-	-
H01	○	-	-	-	-	-
H02	○	-	-	-	-	-
H03	○	-	-	-	-	-
O01	○	-	-	-	-	-
O02	○	-	-	-	-	-
O03	○	-	-	-	-	-
O04	○	-	-	-	-	-
O05	○	-	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

Notes



SBAVATURA
DEBURRING
ENTGRATEN
ÉBAVURAGE

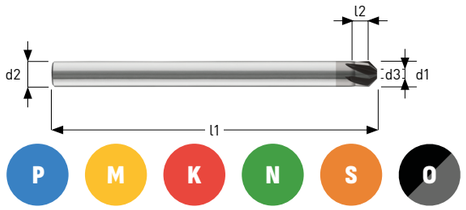
SBAVATORI
CHAMFER TOOLS

TTMCA90	**166**
TTMCD90	**166**
TTMCR90	**167**

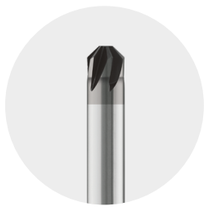
TTMCA90

Smussatore frontale 90°
90° front chamfer
90° vordere Fase
Chanfrein avant 90°

3xD | Z 4-6 | TUSA NORM



P M K N S O

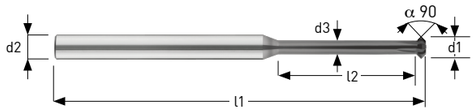


Art. Tusa Precision	d1 0/+0.05	d2 h6	d3 +/-0.02	l1 +/-0.2	l2 0/+0.1	Z
TTMCA90010	1,00	3,00	0,30	40	1,50	4
TTMCA90020	2,00	3,00	0,60	40	3,00	4
TTMCA90030	3,00	3,00	1,00	50	4,20	5
TTMCA90040	4,00	4,00	1,50	50	5,00	6
TTMCA90060	6,00	6,00	2,00	50	7,50	6

TTMCD90

Smussatore doppio 90°
90° double chamfer
90° Doppelfase
Double chanfrein 90°

3xD | Z 4-6 | TUSA NORM



P M K N S O



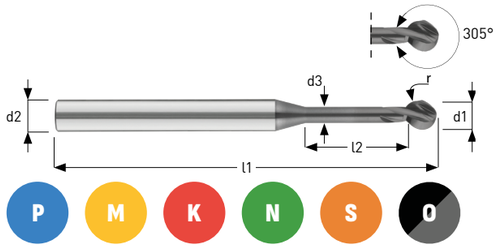
Art. Tusa Precision	d1 +/-0.025	d2 h6	d3 +/-0.015	l1 +/-0.2	l2 +/-0.05	Z
TTMCD90010	0,90	4,00	0,45	50	3,30	4
TTMCD90015	1,40	4,00	0,70	50	5,00	5
TTMCD90020	1,80	4,00	0,90	50	6,50	5
TTMCD90030	2,80	4,00	1,40	60	10,00	5
TTMCD90040	3,70	4,00	1,85	60	13,00	5
TTMCD90050	4,70	6,00	2,35	70	16,50	5
TTMCD90060	5,70	6,00	2,85	70	20,00	6

Parametri | Working parameters | Richtswerte | Paramètres | **168 - 169**

TTMCR90

Smussatore a sfera
Radius chamfer
Radius Fase
Chanfrein de rayon

3xD | Z 3 | TUSA NORM



P M K N S O



Art. Tusa Precision	d1 0/-0.04	d2 h6	d3 0/-0.05	l1 +/-0.2	l2 +/-0.5	r +/-0.02
TTMCR90010	1,00	4,00	0,50	50	3,00	0,50
TTMCR90015	1,50	4,00	0,75	50	4,50	0,75
TTMCR90020	2,00	4,00	1,00	60	6,00	1,00
TTMCR90025	2,50	4,00	1,25	64	7,50	1,25
TTMCR90030	3,00	4,00	1,50	64	9,00	1,50
TTMCR90040	4,00	6,00	2,00	70	12,00	2,00
TTMCR90060	6,00	6,00	3,00	70	18,00	3,00

Notes

Parametri | Working parameters | Richtswerte | Paramètres | **170**

TTMCA90

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocità di taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 1.00-2.00	Ø 3.00-6.00
P00	●	120	0.01-0.04	0.03-0.05
P01	●	120	0.01-0.04	0.03-0.05
P02	●	120	0.01-0.04	0.03-0.05
P03	●	100	0.01-0.03	0.02-0.04
P04	●	80	0.01-0.02	0.01-0.02
P05	●	80	0.01-0.02	0.02-0.03
P06	●	50	0.01-0.02	0.01-0.03
M01	●	50	0.01-0.02	0.02-0.03
M02	●	50	0.01-0.02	0.02-0.03
M03	●	50	0.01-0.02	0.02-0.03
K01	●	60	0.01-0.02	0.01-0.03
K03	●	60	0.01-0.02	0.01-0.03
K02	●	60	0.01-0.02	0.01-0.03
N01	●	200	0.02-0.05	0.03-0.07
N02	●	200	0.02-0.05	0.03-0.07
N03	●	200	0.02-0.05	0.03-0.07
N04	●	120	0.02-0.05	0.03-0.07
S01	●	40	0.01-0.02	0.02-0.03
S02	●	50	0.01-0.02	0.02-0.03
S03	●	40	0.01-0.02	0.02-0.03
S04	●	40	0.01-0.02	0.02-0.03
H01	●	60	0.01-0.02	0.01-0.03
H02	●	60	0.01-0.02	0.01-0.03
H03	○	-	-	-
O01	●	200	0.02-0.05	0.03-0.07
O02	○	-	-	-
O03	○	-	-	-
O04	○	-	-	-
O05	○	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

TTMCD90

Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocità di taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 0.90-1.80	Ø 2.80-5.70
P00	●	120	0.03	0.04
P01	●	120	0.03	0.04
P02	●	120	0.03	0.04
P03	●	100	0.020	0.030
P04	●	80	0.050	0.030
P05	●	50	0.010	0.030
P06	●	50	0.015	0.030
M01	●	50	0.015	0.030
M02	●	50	0.015	0.030
M03	●	50	0.015	0.030
K01	●	60	0.015	0.030
K03	●	60	0.015	0.030
K02	●	60	0.015	0.030
N01	●	200	0.030	0.040
N02	●	200	0.030	0.040
N03	●	200	0.030	0.040
N04	●	200	0.030	0.040
S01	●	40	0.020	0.030
S02	●	50	0.020	0.030
S03	●	40	0.020	0.030
S04	●	40	0.020	0.030
H01	●	60	0.015	0.02
H02	●	60	0.015	0.02
H03	○	-	-	-
O01	●	200	0.030	0.040
O02	○	-	-	-
O03	○	-	-	-
O04	○	-	-	-
O05	○	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

TTMCR90

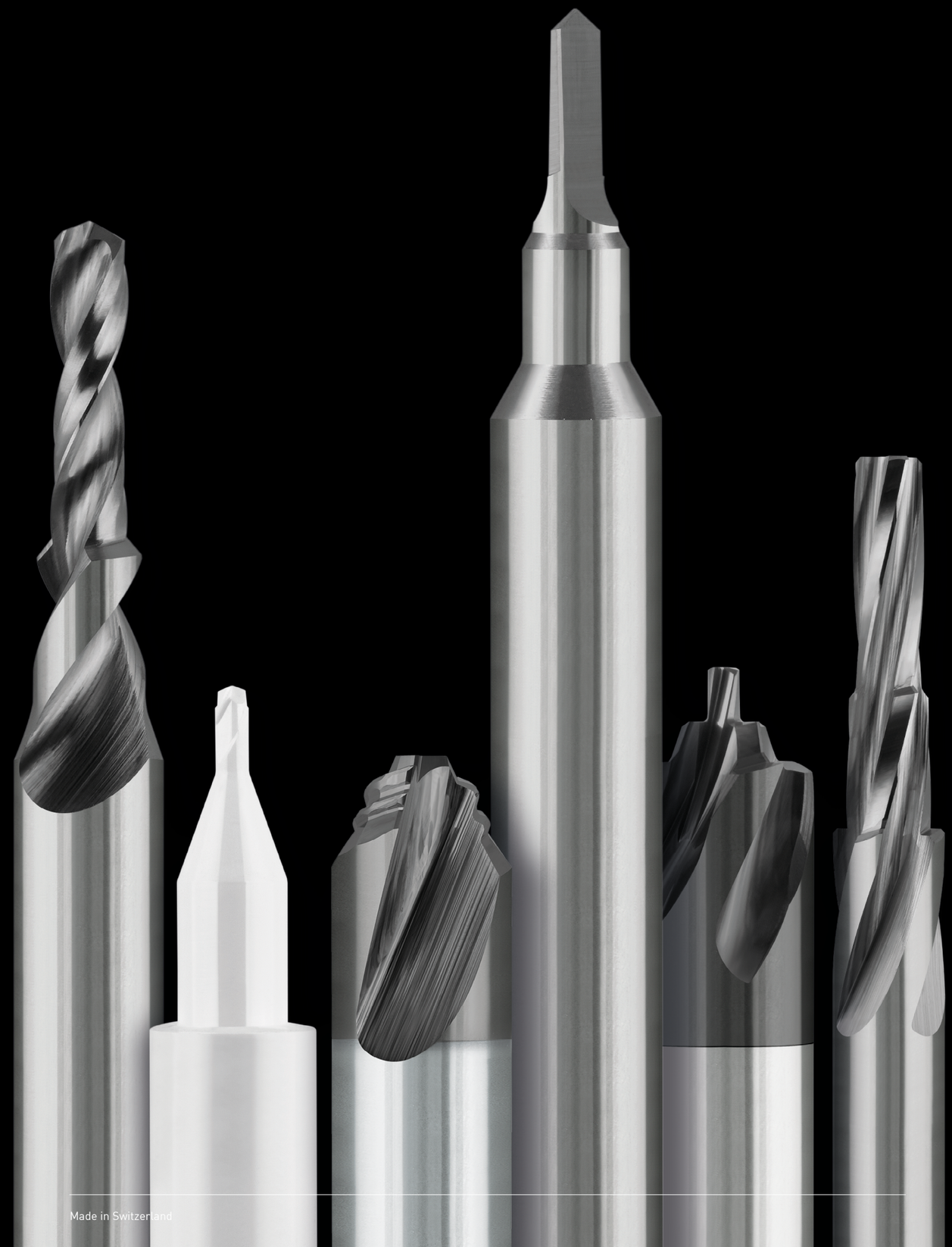
Parametri indicativi per la foratura

Standard values for drilling | Richtswerte für das Bohren | Paramètres indicatifs pour perçage

ISO Class	Cons | Adv	Velocità di taglio Cutting Speed m/min	Avanzamento mm/giro Cutting Feed mm/rev Ø 1.00-2.50	Ø 3.00-4.00	Ø 6.00
P00	●	80-120	0.02-0.03	0.03-0.04	0.04-0.05
P01	●	80-120	0.02-0.03	0.03-0.04	0.04-0.05
P02	●	80-120	0.02-0.03	0.03-0.04	0.04-0.05
P03	●	80-100	0.01-0.02	0.02-0.03	0.03-0.04
P04	●	50-80	0.005-0.015	0.015-0.025	0.025-0.035
P05	●	60-100	0.01-0.015	0.015-0.025	0.025-0.035
P06	●	60-100	0.01-0.015	0.015-0.025	0.025-0.035
M01	●	40-70	0.015-0.025	0.025-0.035	0.025-0.045
M02	●	40-70	0.015-0.025	0.025-0.035	0.025-0.045
M03	●	40-70	0.015-0.025	0.025-0.035	0.025-0.045
K01	●	100-150	0.01-0.02	0.02-0.03	0.03-0.04
K03	●	60-100	0.005-0.015	0.015-0.025	0.025-0.035
K02	●	60-100	0.005-0.015	0.015-0.025	0.025-0.035
N01	●	150-200	0.02-0.03	0.03-0.04	0.04-0.05
N02	●	150-200	0.02-0.03	0.03-0.05	0.05-0.06
N03	●	130-200	0.02-0.03	0.03-0.05	0.05-0.06
N04	●	80-200	0.01-0.025	0.02-0.035	0.03-0.045
S01	●	20-40	0.005-0.015	0.015-0.025	0.02-0.035
S02	●	20-40	0.005-0.015	0.015-0.025	0.02-0.035
S03	●	20-40	0.005-0.015	0.015-0.025	0.02-0.035
S04	●	40-70	0.01-0.025	0.02-0.035	0.03-0.045
H01	●	20-45	0.005-0.015	0.015-0.025	0.025-0.035
H02	●	20-30	0.005-0.01	0.01-0.015	0.015-0.02
H03	○	-	-	-	-
O01	●	100-150	0.01-0.02	0.02-0.03	0.03-0.04
O02	○	-	-	-	-
O03	○	-	-	-	-
O04	○	-	-	-	-
O05	○	-	-	-	-

● **Raccomandato** | Recommended | Empfohlen | Recommandé
◑ **Parzialmente raccomandato** | Partially recommended | Teilweise empfohlen | Partiellement recommandé
○ **Sconsigliato** | Not recommended | Nicht empfohlen | Non recommandé

Notes



UTENSILI SPECIALI
SPECIAL TOOLS
SONDERWERKZEUGE
OUTILS SPÉCIAUX

PROCESSO DI PRODUZIONE 174-175
PRODUCTION PROCESS

UTENSILI IN METALLO DURO 176-177
HM TOOLS

BASSO CONTENUTO DI COBALTO
LOW COBALT CONTENT

MEDIO CONTENUTO DI COBALTO
MEDIUM COBALT CONTENT

ALTO CONTENUTO DI COBALTO
HIGHT COBALT CONTENT

UTENSILI IN CERAMICA 178-179
CERAMIC TOOLS

CERAMICA BIANCA
WHITE CERAMIC

CERAMICA ROSA
PINK CERAMIC

CERAMICA VERDE
GREEN CERAMIC

Utensili realizzati in base a specifiche esigenze del cliente

Tools manufactured according to the customer's specific requirements

Spezialwerkzeuge, maßgeschneidert nach kundenspezifischen Vorgaben

Outils spéciaux conçus sur mesure en fonction des exigences du client

PROCESSO PER RICHIESTA D'OFFERTA ED EMISSIONE ORDINE

Step per formulazione offerta
- Raccolta dei dati tecnici e commerciali
- Analisi interna di fattibilità
- Definizione della soluzione
- Elaborazione e invio dell'offerta al cliente entro 24 ore

Step produzione utensile
- Creazione del disegno
- Simulazione in macchina
- Produzione dell'utensile
- Controllo delle misure dell'utensile

PROCESS OF REQUEST FOR QUOTATION AND ORDER ISSUANCE

Steps for Quotation Preparation
- Collection of technical and commercial data
- Internal feasibility analysis
- Definition of the solution
- Preparation and submission of the quotation to the customer within 24 hours

Tool manufacturing steps
- Drawing creation
- Machine simulation
- Tool production
- Dimensional inspection of the tool

ABLAUF FÜR ANGEBOTSANFRAGE UND AUFTRAGSERTEILUNG

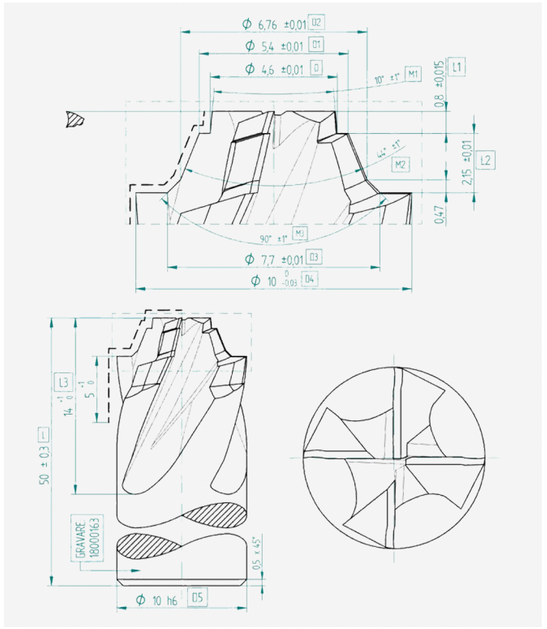
Schritte zur Angebotserstellung
- Erfassung technischer und kaufmännischer Daten
- Interne Machbarkeitsanalyse
- Lösungsdefinition
- Erstellung und Übermittlung des Angebots an den Kunden innerhalb von 24 Stunden

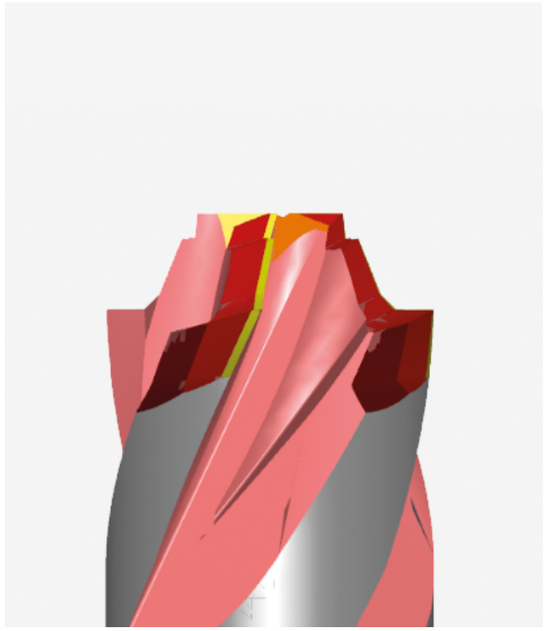
Werkzeugherstellungsschritte
- Zeichnungserstellung
- Maschinensimulation
- Werkzeugherstellung
- Maßkontrolle des Werkzeugs

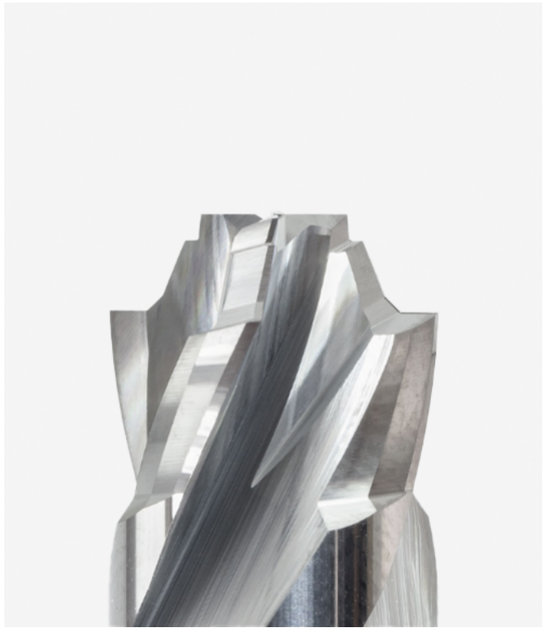
PROCESSUS DE DEMANDE DE DEVIS ET D'ÉMISSION DE COMMANDE

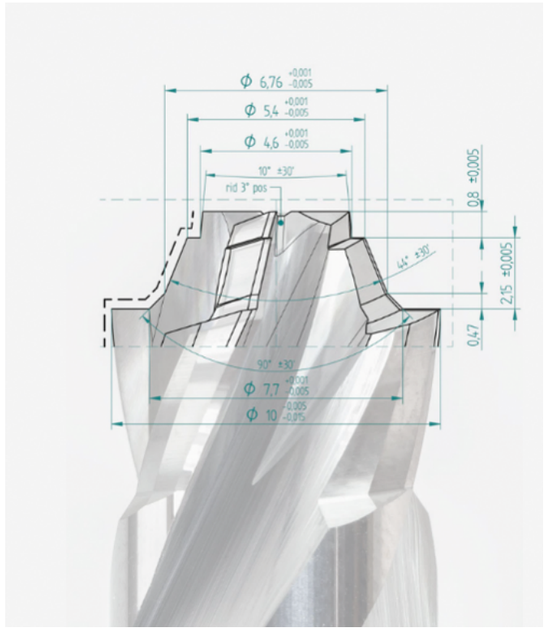
Étapes de préparation du devis
- Collecte des données techniques et commerciales
- Analyse interne de faisabilité
- Définition de la solution
- Élaboration et envoi du devis au client sous 24 heures

Étapes de production de l'outil
- Création du dessin
- Simulation sur machine
- Fabrication de l'outil
- Contrôle dimensionnel de l'outil









DISEGNO
Drawing
Zeichnung
Dessin

SIMULAZIONE
Simulation
Simulation
Simulation

PRODUZIONE
Production
Produktion
Production

CONTROLLO
Control
Kontrolle
Contrôle

Tipi di metallo duro per utensili e le loro proprietà

Basso contenuto di cobalto (4–6%)
- Alta durezza
- Alta resistenza all'usura
- Bassa tenacità

Utilizzato per:
- Lavorazioni ad alta velocità
- Materiali duri e abrasivi (ghisa, metalli non ferrosi duri)
- Lame di taglio con geometrie affilate

Medio contenuto di cobalto (6–10%)
- Compromesso tra durezza e tenacità
- Buona versatilità

Utilizzato per:
- Lavorazioni generiche
- Fresatura, tornitura, foratura
- Materiali di media difficoltà (acciai non trattati, acciai legati)

Alto contenuto di cobalto (10–20%)
- Maggiore tenacità
- Minore durezza
- Migliore resistenza agli urti e alla rottura

Utilizzato per:
- Interruzioni di taglio (lavorazioni discontinue)
- Materiali tenaci (acciai inossidabili, acciai trattati termicamente)
- Lavorazioni pesanti o con vibrazioni

Types of hard metal for tools and their properties

Low cobalt content (4–6%)
- High hardness
- High wear resistance
- Low toughness

Used for:
- High-speed machining
- Hard and abrasive materials (cast iron, hard non-ferrous metals)
- Cutting blades with sharp geometries

Medium cobalt content (6–10%)
- Balance between hardness and toughness
- Good versatility

Used for:
- General-purpose machining
- Milling, turning, drilling
- Medium-difficulty materials (unhardened steels, alloy steels)

High cobalt content (10–20%)
- Higher toughness
- Lower hardness
- Better resistance to impact and breakage

Used for:
- Interrupted cutting (discontinuous operations)
- Tough materials (stainless steels, heat-treated steels)
- Heavy-duty or vibrating operations

Hartmetalltypen für Werkzeuge und ihre Eigenschaften

Niedriger Kobaltgehalt (4–6%)
- Hohe Härte
- Hohe Verschleißfestigkeit
- Geringe Zähigkeit

Verwendet für:
- Hochgeschwindigkeitsbearbeitung
- Harte und abrasive Materialien (Gusseisen, harte NE-Metalle)
- Schneidklingen mit scharfen Geometrien

Mittlerer Kobaltgehalt (6–10%)
- Kompromiss zwischen Härte und Zähigkeit
- Gute Vielseitigkeit

Verwendet für:
- Allgemeine Bearbeitungen
- Fräsen, Drehen, Bohren
- Mittelharte Materialien (unbehandelte Stähle, legierte Stähle)

Hoher Kobaltgehalt (10–20%)
- Höhere Zähigkeit
- Geringere Härte
- Bessere Stoß- und Bruchfestigkeit

Verwendet für:
- Unterbrochene Schnitte (diskontinuierliche Bearbeitung)
- Zähe Materialien (rostfreie Stähle, wärmebehandelte Stähle)
- Schwere oder vibrationsanfällige Bearbeitungen

Types de métal dur pour outils et leurs propriétés

Faible teneur en cobalt (4–6%)
- Haute dureté
- Excellente résistance à l'usure
- Faible ténacité

Utilisé pour:
- Usinage à grande vitesse
- Matériaux durs et abrasifs (fonte, métaux non ferreux durs)
- Lames de coupe avec géométries tranchantes

Teneur moyenne en cobalt (6–10%)
- Bon compromis entre dureté et ténacité
- Bonne polyvalence

Utilisé pour:
- Usinage général
- Fraisage, tournage, perçage
- Matériaux de difficulté moyenne (aciers non traités, aciers alliés)

Forte teneur en cobalt (10–20%)
- Ténacité accrue
- Dureté réduite
- Meilleure résistance aux chocs et à la rupture

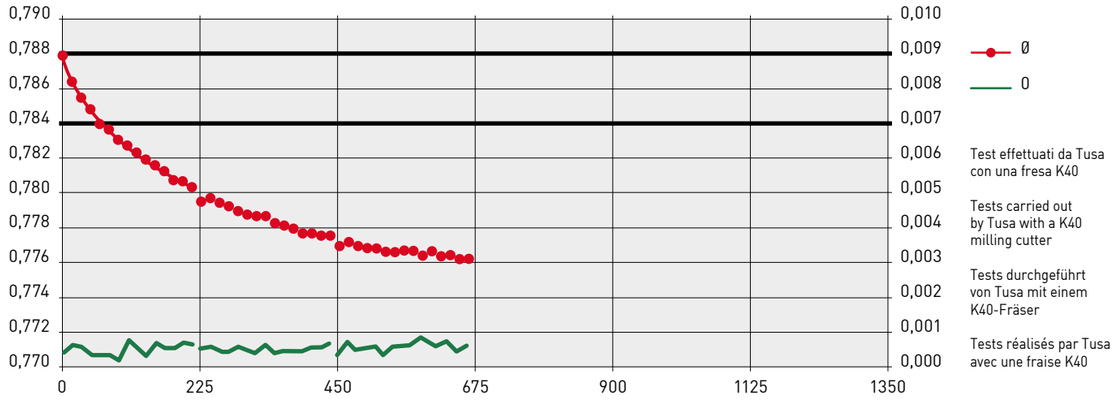
Utilisé pour:
- Coupes interrompues (usinage discontinu)
- Matériaux tenaces (aciers inoxydables, aciers traités thermiquement)
- Usinages lourds ou soumis à vibrations

Caratteristiche | Characteristics | Eigenschaften | Caractéristique

Resistenza al calore Buona (fino a 800–1000°C)	**Heat resistance** Good (up to 800–1000°C)	**Hitzebeständigkeit** Gut (bis zu 800–1000°C)	**Résistance à la chaleur** Bonne (jusqu'à 800–1000°C)
Velocità di taglio Media	**Cutting speed** Medium	**Schnittgeschwindigkeit** Mittel	**Vitesse de coupe** Moyenne
Resistenza all'usura abrasiva Alta	**Abrasive wear resistance** High	**Abriebfestigkeit** Hoch	**Résistance à l'usure abrasive** Élevée
Durezza (HV) 1400–1800 HV	**Hardness (HV)** 1400–1800 HV	**Härte (HV)** 1400–1800 HV	**Dureté (HV)** 1400–1800 HV
Stabilità chimica Discreta	**Chemical stability** Moderate	**Chemische Stabilität** Mittel	**Stabilité chimique** Moyenne
Lavorazioni ideali Ampio spettro, inclusi acciai e inox	**Ideal applications** Wide range, inc. steels and stainless steels	**Ideale Anwendungen** Breites Spektrum, inkl. Stahl und Edelstahl	**Usinages idéaux** Large éventail, y compris aciers et inox

Risultati del test di una fresa in metallo duro prodotta da Tusa

Test results of a solid carbide milling cutter produced by Tusa | Testergebnisse eines Hartmetallfräsers, hergestellt von Tusa | Résultats du test d'une fraise en carbure produite par Tusa



Parametri di lavoro: F=230mm/min; fz=0.005 mm/t
Working parameters: F = 230 mm/min; fz = 0.005 mm/t
Arbeitsparameter: F = 230 mm/min; fz = 0,005 mm/t
Paramètres de travail: F = 230 mm/min; fz = 0,005 mm/t

Risultato del test: Variazione della tolleranza di 4µ dopo 100 fori
Test result: Tolerance variation of 4µ after 100 holes
Testergebnis: Toleranzabweichung von 4µ nach 100 Bohrungen
Résultat du test: Variation de tolérance de 4µ après 100 perçages

Tipi di ceramiche per utensili e le loro proprietà

Types of ceramics for tools and their properties

Ceramica bianca (Al_2O_3 - allumina pura)
- Molto dura, stabile termicamente, poco tenace
- Durezza: ~1800-2000 HV

Utilizzata per:
- Lavorazioni di acciai rapidi e inox

Ceramica rosa ($Al_2O_3 + Cr_2O_3$)
- Simile alla bianca ma leggermente più tenace e resistente all'usura
- Durezza simile: ~1800-2000 HV.

Utilizzata per:
- Lavorazione su acciaio acciai temprati

Ceramica verde (nitruro di silicio - Si_3N_4)
- Molto tenace e molto più resistente agli shock termici rispetto all'allumina.
- Durezza: ~1500–1600 HV

Utilizzata per:
- Lavorazioni sul vetro,ceramica, metallo duro e materiali sinterizzati

White ceramic (Al_2O_3 – pure alumina)
- Very hard, thermally stable, low toughness
- Hardness: ~1800–2000 HV

Used for:
- Machining of high-speed steels and stainless steels

Pink ceramic ($Al_2O_3 + Cr_2O_3$)
- Similar to white ceramic, but slightly tougher and more wear-resistant
- Hardness: ~1800–2000 HV

Used for:
- Machining of steels and hardened steels

Green ceramic (Silicon nitride – Si_3N_4)
- Very tough and significantly more resistant to thermal shock than alumina
- Hardness: ~1500–1600 HV

Used for:
- Machining of glass, ceramics, hard metals, and sintered materials

Keramikarten für Werkzeuge und ihre Eigenschaften

Types de céramiques pour outils et leurs propriétés

Weiße Keramik (Al_2O_3 – reine Aluminiumoxid)
- Sehr hart, thermisch stabil, geringe Zähigkeit
- Härte: ~1800–2000 HV

Verwendet für:
- Bearbeitung von Schnellarbeitsstahl und rostfreiem Stahl

Rosa Keramik ($Al_2O_3 + Cr_2O_3$)
- Ähnlich der weißen Keramik, aber etwas zäher und verschleißfester
- Härte: ~1800–2000 HV

Verwendet für:
- Bearbeitung von Stahl und gehärteten Stählen

Grüne Keramik (Siliziumnitrid – Si_3N_4)
- Sehr zäh und deutlich widerstandsfähiger gegen thermischen Schock als Aluminiumoxid
- Härte: ~1500–1600 HV

Verwendet für:
- Bearbeitung von Glas, Keramik, Hartmetall und gesinterten Werkstoffen

Céramique blanche (Al_2O_3 – alumine pure)
- Très dure, stable thermiquement, faible ténacité
- Dureté: ~1800–2000 HV

Utilisée pour:
- Usinage des aciers rapides et des aciers inoxydables

Céramique rose ($Al_2O_3 + Cr_2O_3$)
- Similaire à la blanche, mais légèrement plus tenace et résistante à l'usure
- Dureté: ~1800–2000 HV

Utilisée pour:
- Usinage des aciers et des aciers trempés

Céramique verte (nitrure de silicium – Si_3N_4)
- Très tenace et nettement plus résistante aux chocs thermiques que l'alumine
- Dureté: ~1500–1600 HV

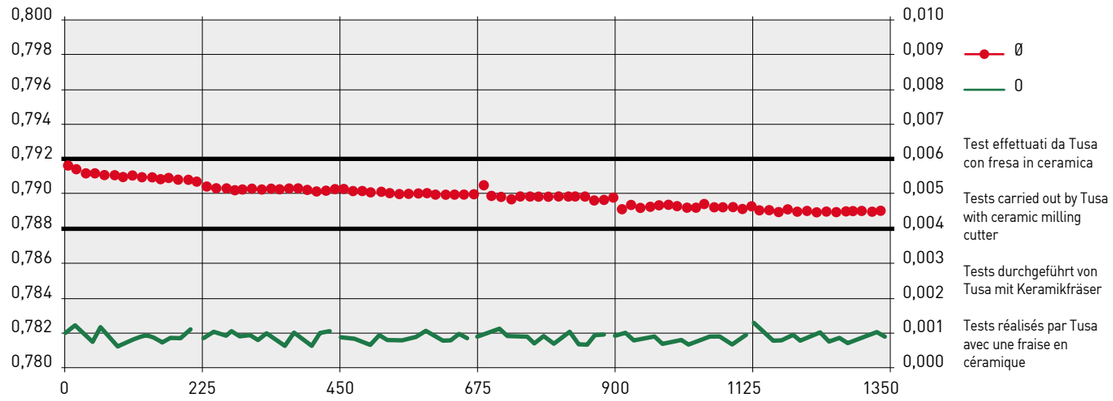
Utilisée pour:
- Usinage du verre, de la céramique, du métal dur et des matériaux frittés

Caratteristiche | Characteristics | Eigenschaften | Caractéristique

Resistenza al calore Molto elevata (fino a 1200–1400°C)	**Heat resistance** Very high (up to 1200–1400°C)	**Hitzebeständigkeit** Sehr hoch (bis zu 1200-1400°C)	**Résistance à la chaleur** Très élevée (jusqu'à 1200–1400°C)
Velocità di taglio Molto alta (fino a 5–10× rispetto al carburo)	**Cutting speed** Extremely high (up to 5–10× higher than carbide)	**Schnittgeschwindigkeit** Extrem hoch (bis zu 5–10× höher als Hartmetall)	**Vitesse de coupe** Extrêmement élevée (jusqu'à 5 à 10× supérieure au carbure)
Resistenza all'usura abrasiva Alta	**Abrasive wear resistance** High	**Abriebfestigkeit** Hoch	**Résistance à l'usure abrasive** Élevée
Durezza (HV) 1800–2500 HV (in base al tipo)	**Hardness (HV)** 1800–2500 HV (depending on the type)	**Härte (HV)** 1800–2500 HV (je nach Typ)	**Dureté (HV)** 1800–2500 HV (selon le type)
Stabilità chimica Eccellente su materiali ad alta temperatura	**Chemical stability** Excellent on high-temperature materials	**Chemische Stabilität** Ausgezeichnet bei Hochtemperaturmaterialien	**Stabilité chimique** Excellente sur les matériaux à haute température
Lavorazioni ideali Ghisa, superleghe, materiali duri	**Ideal applications** Cast iron, superalloys, hard materials	**Ideale Anwendungen** Gusseisen, Superlegierungen, harte Werkstoffe	**Usinages idéaux** Fonte, superalliages, matériaux durs

Risultati del test di una fresa in ceramica prodotta da Tusa

Test results of a ceramic milling cutter produced by Tusa | Testergebnisse eines Keramikfräsers, hergestellt von Tusa | Résultats du test d'une fraise en céramique produite par Tusa



Parametri di lavoro: F=230mm/min; fz=0.005 mm/t
Working parameters: F = 230 mm/min; fz = 0.005 mm/t
Arbeitsparameter: F = 230 mm/min; fz = 0,005 mm/t
Paramètres de travail: F = 230 mm/min; fz = 0,005 mm/t

Risultato del test: Variazione della tolleranza di 4µ dopo 1350 fori
Test result: Tolerance variation of 4µ after 1350 holes
Testergebnis: Toleranzabweichung von 4µ nach 1350 Bohrungen
Résultat du test: Variation de tolérance de 4µ après 1350 perçages

ACCESSORI E SERVIZI
ACCESSORIES AND SERVICES
ZUBEHÖR UND DIENSTLEISTUNGEN
ACCESSOIRES ET SERVICES

ACCESSORI 182
ACCESSORIES

RAFFREDDAMENTO PERIFERICO
PERIPHERAL COOLING

BUONE PRATICHE DI LAVORO 183-185
BEST WORKING PRACTICES

UTENSILI CON ADDUZIONE INTERNA
TOOLS WITH INTERNAL COOLANT HOLES

CONSIGLI PER L'OTTIMIZZAZIONE DELLA LAVORAZIONE
RECOMMENDATIONS FOR PROCESS OPTIMIZATION

PRESSIONE CONSIGLIATA
RECOMMENDED PRESSURE

PROCESSO PER FORATURA AD ALTO RENDIMENTO
MACHINING PROCESS FOR HIGH PERFORMANCE DRILLING

SERVIZI 186-187
SERVICES

RIAFFILATURA
REGRINDING

SPEDIZIONI IN UE
DELIVERY WITHIN THE EU

ACCESSORI | ACCESSORIES

Raffreddamento periferico
Peripheral cooling
Periphere Abkühlung
Refroidissement périphérique

In partnership with

RBC BEARINGS SCHAUBLIN

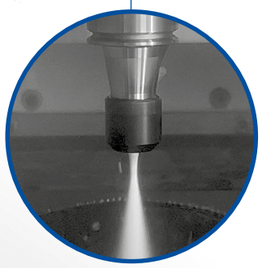
Tusa Precision Tools collabora con Schaublin SA per fornire la migliore soluzione di lubro-refrigerazione dedicata ai micro-utensili. **HydroNut** è una ghiera brevettata compatibile con porta-pinze ER che genera e convoglia un getto denso e adeso all'utensile anche ad alte velocità.

Tusa Precision Tools collaborates with Schaublin SA to provide the best lubrication-cooling solution dedicated to micro-tools. **HydroNut** is a patented nut compatible with ER collet holders that generates and directs a dense jet adhering to the tool even at high speeds.

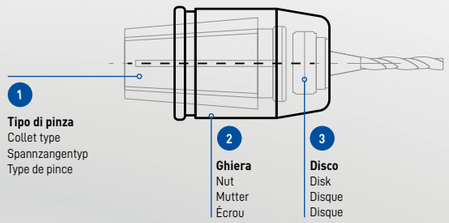
Tusa Precision Tools arbeitet mit Schaublin SA zusammen, um die beste Schmier-/Kühllösung für Mikrowerkzeuge bereitzustellen. **HydroNut** ist eine patentierte Überwurfmutter, die mit ER-Spannzangenaufnahmen kompatibel ist und einen dichten, am Werkzeug haftenden Strahl erzeugt und führt – auch bei hohen Drehzahlen.

Tusa Precision Tools collabore avec Schaublin SA pour offrir la meilleure solution de lubrification-refroidissement dédiée aux micro-outils. **HydroNut** est un écrou breveté compatible avec les porte-pinces ER, qui génère et dirige un jet dense et adhérent à l'outil même à haute vitesse.





Tested at:
40'000 rpm | 40 bars of pressure,
6% emulsion



1 Tipo di pinza DIN 6499-A/B Collet type DIN 6499-A/B Spannzangentyp DIN 6499-A/B Type de pince DIN 6499-A/B	2 Codice ghiera Nut code Muttercode Code écrou	Filettatura ghiera Nut thread Muttergewinde Filetage écrou	3 Codice disco Disk code Scheibencode Code disque	Diametro disco Disk diameter Scheibendurchmesser Diamètre disque (mm)
ER 16	61-16852	M19x1	89-96016	0.3-10.0
	61-16851	M20x1	89-96016	0.3-10.0
	61-16850	M22x1.5	89-96016	0.3-10.0
ER20	61-20851	M24x1	89-96020	1.0-13.0
	61-20850	M25x1.5	89-96021	1.0-13.0

BUONE PRATICHE DI LAVORO | BEST WORKING PRACTICES

Utensili con adduzione interna

Un filtraggio di qualità è molto importante in foratura con adduzione interna altrimenti particelle residue o trucioli potrebbero otturare i fori interni.

- Punte elicoidali con diametro ←2 mm qualità di filtrazione ←= 0,010 mm
- Punte elicoidali con diametro ←3 mm qualità di filtrazione ←= 0,020 mm
- Punte elicoidali con diametro ←6 mm qualità di filtrazione ←= 0,050 mm

Per un processo affidabile al meno 30 bar di pressione di lubrificazione è richiesta per foratura con diametri da 4 a 6 mm. Sono necessarie pressioni superiori per diametri più piccoli. Alte pressioni sono generalmente più ottimali per un effetto di raffreddamento e risciacquo.

Tools with internal coolant holes

Good filter is important in drilling tools with through-tool cooling, so that no dirt particles or chips reach the tool through the coolant supply and jeopardize coolant flow in the tool. The following filter qualities must be complied for small diameters.

- Spiral drill types with diameter ←2 mm filter quality ←= 0,010 mm
- Spiral drill types with diameter ←3 mm filter quality ←= 0,020 mm
- Spiral drill types with diameter ←6 mm filter quality ←= 0,050 mm

At least 30 bar coolant pressure is requested for drilling diameter 4 - 6 mm for a reliable drilling process. Higher pressures are needed for smaller drill diameters. High pressure is generally better for the cooling and flushing effect.

Werkzeuge mit Innenkühlung

Beim Bohren mit Innenkühlung ist eine gute Filterung sehr wichtig, da sonst Restpartikel oder Späne die Innenbohrungen verstopfen könnten.

- Spiralbohrer mit Durchmesser ←2 mm Qualität Filtrationsrate ←= 0,010 mm
- Spiralbohrer mit Durchmesser ←3 mm Qualität Filtrationsrate ←= 0,020 mm
- Spiralbohrer mit Durchmesser ←6 mm Qualität Filtrationsrate ←= 0,050 mm

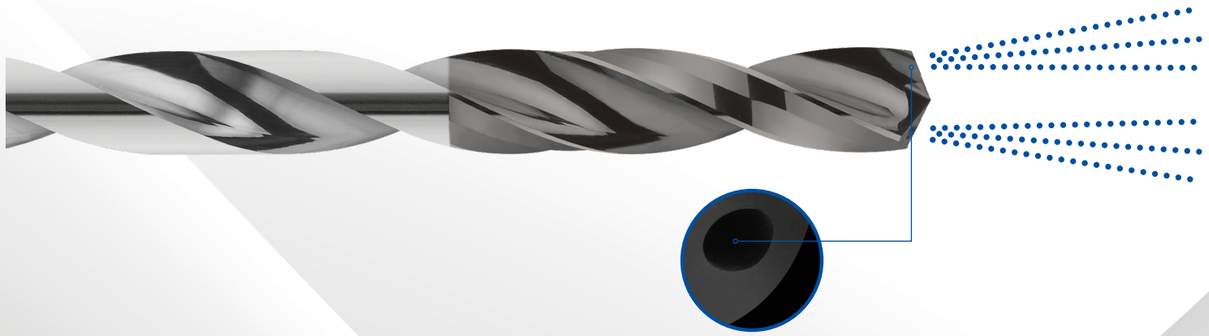
Für einen sicheren Prozess sind bei den Bohrdurchmessern 4 bis 6 mm mindestens 30 bar Schmierdruck erforderlich. Für kleinere Durchmesser sind höhere Drücke erforderlich. Höhere Drücke sind im Allgemeinen optimaler für eine Kühl- und Spülwirkung.

Outils avec arrosage interne

Un bon filtre est très important dans le perçage avec arrosage interne afin d'éviter que des particules résiduelles ou des copeaux arrivent dans les canaux de lubrification interne. Les filtres doivent être appliqués comme suit.

- Forets hélicoïdaux de diamètre ←2 mm qualité taux de filtration ←= 0,010 mm
- Forets hélicoïdaux de diamètre qualité ←3 mm taux de filtration ←= 0,020 mm
- Forets hélicoïdaux de diamètre ←6 mm qualité taux de filtration ←= 0,050 mm

Une pression d'au moins 30 bars par canal, est nécessaire pour assurer un processus de perçage fiable. Des pressions plus élevées sont nécessaires pour des petits diamètres. Des hautes pressions sont généralement plus optimales pour le refroidissement et le rinçage.



Consigli per l'ottimizzazione della lavorazione

Liquido di raffreddamento:
Tusa Precision Tools raccomanda l'impiego di olio intero come lubrificante. In alternativa si possono anche usare emulsioni con specifici additivi.

Qualità del filtro:
Un buon sistema di filtrazione e particolarmente importante per piccoli diametri:

Filtro ← 0.01 per diametri Ø ← 1 mm
Filtro ← 0.02 per diametri tra Ø 1 e Ø 3

Recommendations for process optimization

Coolant:
Tusa Precision Tools recommends using full oil as a lubricant. Alternatively, emulsions with specific additives can also be used.

Filter quality:
A good filtration system is particularly important for small diameters:

Filter ← 0.01 for diameters Ø ← 1 mm
Filter ← 0.02 for diameters between Ø 1 and Ø 3

Empfehlungen zur Prozessoptimierung

Kühlmittel:
Tusa Precision Tools empfiehlt die Verwendung von Vollöl als Schmiermittel. Alternativ können auch Emulsionen mit spezifischen Additiven verwendet werden.

Filterqualität:
Ein gutes Filtersystem ist besonders wichtig für kleine Durchmesser:

Filter ← 0,01 für Durchmesser Ø ← 1 mm
Filter ← 0,02 für Durchmesser zwischen Ø 1 und Ø 3

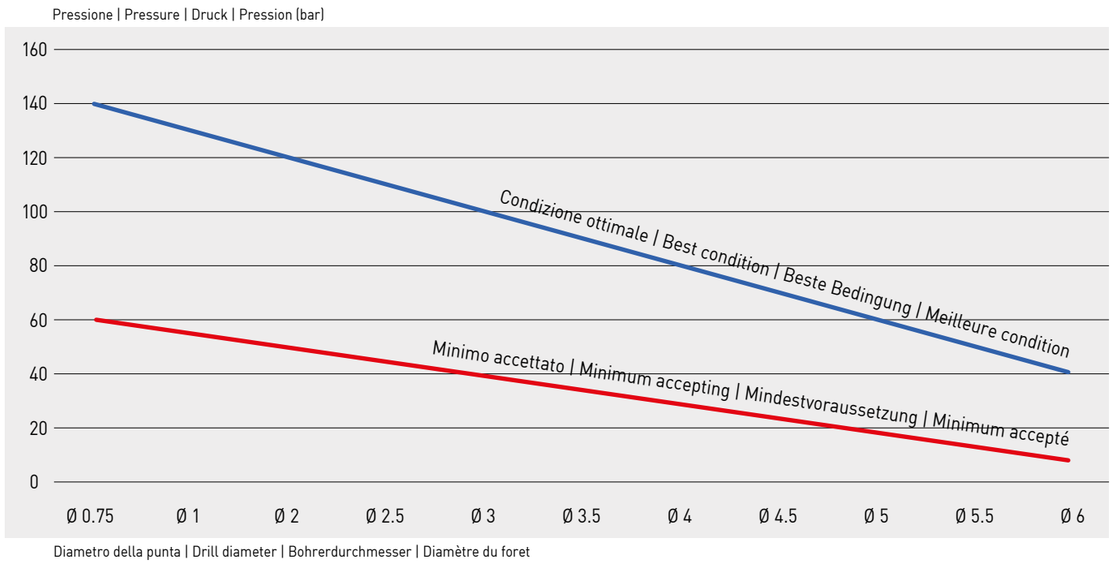
Recommandations pour l'optimisation du processus

Liquide de lubrification-réfrigération:
Tusa Precision Tools recommande l'utilisation d'huile complète comme lubrifiant. En alternative, des émulsions avec des additifs spécifiques peuvent également être utilisées.

Qualité du filtre:
Un bon système de filtration est particulièrement important pour les petits diamètres:

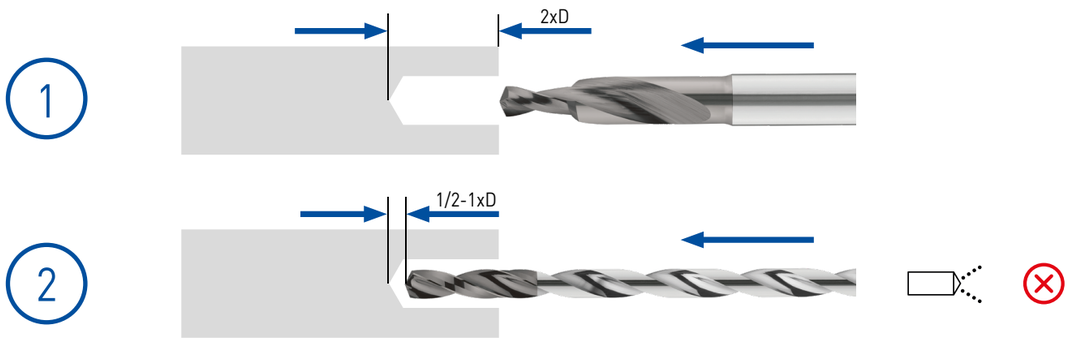
Filtre ← 0,01 pour des diamètres Ø ← 1 mm
Filtre ← 0,02 pour des diamètres entre Ø 1 et Ø 3

Pressione consigliata | Recommended pressure Empfohlener Druck | Pression recommandée



Processo per foratura ad alto rendimento
Machining process for high performance drilling
Bearbeitungsverfahren Hochleistungsbohren
Procédé d'usinage à grand rendement

Strategia di foratura → 9xD | Drilling strategy → 9xD
Bohrstrategie → 9xD | Stratégie de perçage → 9xD



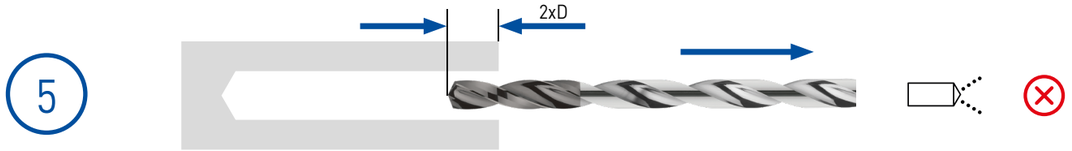
n = max 500 min-1 / vf = 25% - 50%



vc = 100% → start vf / vc = 100% / vf = 100%



vc = 100% / vf = 100%



vc = 100% / vf = 200%-500%



n = max. 500 min-1 / vf = max

SERVIZI | SERVICES

Riaffilatura

Siamo in grado di riaffilare i nostri utensili con precisione e qualità, grazie all'utilizzo di tecnologie all'avanguardia, macchinari CNC e mole specifiche. Questo ci consente di garantire che ogni utensile sottoposto al processo di riaffilatura mantenga le geometrie e performance pari al nuovo. All'arrivo della merce presso il nostro stabilimento, gli utensili vengono accuratamente controllati per verificarne lo stato d'usura. Gli utensili che presentano danni irreparabili, come scheggiature sui taglienti o usura eccessiva, non verranno riaffilati.
Solo quelli ritenuti idonei saranno sottoposti a riaffilatura e, se necessario, rivestiti con il coating originale, per ripristinare completamente le loro prestazioni. Al termine del processo, ogni utensile viene sottoposto a un ulteriore controllo qualità, per assicurarci che rispetti pienamente gli standard tecnici e funzionali richiesti.

Che benefici offre il processo di riaffilatura?

Vantaggi economici: risparmio sui costi e ottimizzazione dell'investimento grazie al prolungamento della vita dell'utensile
Vantaggi qualitativi: ripristino in originale delle prestazioni di taglio garantendo alta precisione nella lavorazione
Vantaggi legati alla sostenibilità ambientale: riduzione degli sprechi con conseguente diminuzione della domanda per le nuove risorse

Regrinding

We are able to regrind our tools with precision and quality, thanks to the use of cutting-edge technologies, CNC machinery, and specific grinding wheels. This allows us to ensure that every tool undergoing the regrinding process maintains geometries and performance equivalent to new. Upon arrival at our facility, the tools are carefully inspected to assess their wear condition. Tools with irreparable damage, such as chipped cutting edges or excessive wear, will not be regrinded.
Only those deemed suitable will undergo regrinding and, if necessary, be coated with the original coating to fully restore their performance. At the end of the process, each tool undergoes a final quality check to ensure it fully meets the required technical and functional standards.

What are the advantages of the regrinding process?

Economic benefits: cost savings and optimized investment thanks to the extended tool life
Quality benefits: restoration of original cutting performance, ensuring high precision in machining
Environmental sustainability benefits: waste reduction and, as a result, decreased demand for new resources

Nachschleifen

Wir sind in der Lage, unsere Werkzeuge mit Präzision und Qualität nachzuschleifen, dank des Einsatzes modernster Technologien, CNC-Maschinen und spezieller Schleifscheiben. Dies ermöglicht es uns sicherzustellen, dass jedes Werkzeug, das dem Nachschleifprozess unterzogen wird, Geometrien und Leistung wie ein neues Werkzeug beibehält. Bei Ankunft der Werkzeuge in unserem Werk werden diese sorgfältig auf ihren Verschleißzustand überprüft. Werkzeuge mit irreparablen Schäden, wie beispielsweise Ausbrüche an den Schneidkanten oder übermäßiger Verschleiß, werden nicht nachgeschliffen.
Nur geeignete Werkzeuge werden nachgeschliffen und, falls erforderlich, mit der originalen Beschichtung versehen, um ihre Leistung vollständig wiederherzustellen. Am Ende des Prozesses unterliegt jedes Werkzeug einer abschließenden Qualitätskontrolle, um sicherzustellen, dass es die geforderten technischen und funktionalen Standards vollständig erfüllt.

Welche Nutzen bietet der Nachschärfprozess?

Wirtschaftliche Vorteile: Kosteneinsparung und bessere Investitionsrentabilität durch verlängerte Werkzeuglebensdauer
Qualitative Vorteile: Wiederherstellung der ursprünglichen Schneidleistung mit hoher Bearbeitungspräzision
Umweltbezogene Vorteile: Abfallreduzierung und damit geringerer Bedarf an neuen Ressourcen

Réaffûtage

Nous sommes en mesure de réaffûter nos outils avec précision et qualité, grâce à l'utilisation de technologies de pointe, de machines CNC et de meules spécifiques. Cela nous permet de garantir que chaque outil soumis au processus de réaffûtage conserve des géométries et des performances équivalentes à celles d'un outil neuf. À l'arrivée des outils dans notre atelier, ceux-ci sont soigneusement contrôlés afin de vérifier leur état d'usure. Les outils présentant des dommages irréparables, tels que des éclats sur les tranchants ou une usure excessive, ne seront pas réaffûtés. Seuls ceux jugés aptes seront réaffûtés et, si nécessaire, revêtus du traitement de surface d'origine pour restaurer pleinement leurs performances. À l'issue du processus, chaque outil fait l'objet d'un contrôle qualité supplémentaire afin de s'assurer qu'il respecte pleinement les normes techniques et fonctionnelles requises.

Quels sont les Bénéfices du processus de réaffûtage?

Avantages économiques: réduction des coûts et optimisation de l'investissement grâce à la prolongation de la durée de vie de l'outil
Avantages qualitatifs: restitution des performances de coupe d'origine, garantissant une grande précision dans l'usinage
Avantages environnementaux: réduction des déchets entraînant une diminution de la demande en nouvelles ressources

Spedizioni in UE

Siamo un'azienda svizzera con sede produttiva e uffici situati interamente sul territorio elvetico, dove progettiamo e realizziamo utensili di alta precisione secondo i più rigorosi standard qualitativi. Per ottimizzare la logistica e garantire un servizio ancora più rapido ed efficiente ai nostri clienti europei, abbiamo deciso di aprire un magazzino anche in Italia. In questa sede gestiamo uno stock dedicato dei nostri prodotti standard, che siamo in grado di spedire il giorno stesso della ricezione dell'ordine ufficiale.

Quali sono i vantaggi per il cliente?

Tempi di consegna più rapidi: spedizioni all'interno dell'Unione Europea permettono una logistica più veloce ed efficiente
Semplificazione burocratica: nessuna procedura doganale a carico del cliente
Risparmio economico: eliminazione dei costi aggiuntivi legati allo sdoganamento
Maggiore flessibilità: stock disponibile in prossimità del cliente e gestione più reattiva di ordini e urgenze

Delivery within the EU

We are a Swiss company with production facilities and offices entirely located within Switzerland, where we design and manufacture high-precision tools according to the most stringent quality standards. To optimize logistics and provide an even faster and more efficient service to our European customers, we have decided to open a warehouse in Italy. At this location, we manage a dedicated stock of our standard products, which we can ship on the same day the official order is received.

What are the benefits for the customer?

Faster delivery times: shipments within the European Union allow for quicker and more efficient logistics
Simplified bureaucracy: no customs procedures required from the customer
Cost savings: elimination of additional customs clearance fees
Greater flexibility: stock available close to the customer and more responsive management of orders and urgent requests

Versand innerhalb der EU

Wir sind ein Schweizer Unternehmen mit Produktionsstätten und Büros, die sich vollständig auf Schweizer Gebiet befinden, wo wir hochpräzise Werkzeuge nach den strengsten Qualitätsstandards entwickeln und fertigen. Um die Logistik zu optimieren und unseren europäischen Kunden einen noch schnelleren und effizienteren Service zu bieten, haben wir beschlossen, ein Lager auch in Italien zu eröffnen. An diesem Standort verwalten wir einen dedizierten Bestand unserer Standardprodukte, die wir am selben Tag versenden können, an dem die offizielle Bestellung eingeht.

Welche Vorteile ergeben sich für den Kunden?

Schnellere Lieferzeiten: Versand innerhalb der Europäischen Union ermöglicht eine schnellere und effizientere Logistik
Vereinfachte Bürokratie: keine Zollformalitäten für den Kunden
Kostenersparnis: Wegfall zusätzlicher Zollabfertigungskosten
Größere Flexibilität: Lagerbestand in Kundennähe und reaktionsschnellere Bearbeitung von Bestellungen und Eilaufträgen

Expéditions au sein de l'UE

Nous sommes une entreprise suisse avec des sites de production et des bureaux entièrement situés en Suisse, où nous concevons et fabriquons des outils de haute précision selon les normes qualitatives les plus strictes. Pour optimiser la logistique et offrir un service encore plus rapide et efficace à nos clients européens, nous avons décidé d'ouvrir un entrepôt en Italie. Dans ce site, nous gérons un stock dédié de nos produits standards, que nous pouvons expédier le jour même de la réception de la commande officielle.

Quels sont les avantages pour le client?

Délais de livraison plus rapides: les expéditions au sein de l'Union européenne permettent une logistique plus rapide et efficace
Simplification administrative: aucune procédure douanière à la charge du client
Économies: suppression des frais supplémentaires liés au dédouanement
Plus grande flexibilité: stock disponible à proximité du client et gestion plus réactive des commandes et des urgences

GRUPPO MATERIALI | MATERIALS GROUP

Acciai a basso contenuto di Carbonio, Truciolo lungo (<120 HB)
Long chipping Low Carbon Steels (<120 HB)

Wrknr	DIN
1.0214	C10C
1.1121	C10E
1.0037	S235JR

Acciai a basso contenuto di Carbonio, Truciolo corto (<120HB)
Short chipping Low Carbon Steels (<120HB)

Wrknr	DIN
1.0402	C22
1.0406	C25

Acciai a medio e alto contenuto di Carbonio (<220HB)
Medium and High Carbon Steels (<220HB)

Wrknr	DIN
1.0501	C35
1.0503	C45
1.0535	C55
1.0601	C60

Acciai Legati, Acciai da Utensili (600-850 N/mm2)
Alloy Steels, Tool Steels (N/mm2 600-850)

Wrknr	DIN
1.3505	100Cr6
1.5752	14NiCr14
1.5919	15CrNi6
1.6523	21NiCrMo2
1.6587	17CrNiMo6
1.7015	15Cr3
1.7131	16MnCr5
1.7176	55Cr3
1.7218	25CrMo4
1.7220	34CrMo4
1.7223	41CrMo4
1.1157	40Mn4
1.1167	36Mn5
1.1170	28Mn6
1.6511	36CrNiMo4
1.7033	34Cr4
1.7034	37Cr4
1.7035	41Cr4
1.7218	25CrMo4
1.7220	34CrMo4
1.7223	41CrMo4
1.7225	42CrMo4
1.8507	34CrAlMo5
1.8509	41CrAlMo7
1.8515	31CrMo12
1.2332	47CrMo4
1.2510	100MnCrW4
1.2516	120WV4
1.2542	45WCrV7
1.2833	100V1
1.2842	90MnCrV8
1.6511	36CrNiMo4
1.6580	30CrNiMo8
1.6582	34CrNiMo6
1.7220	34CrMo4
1.7223	41CrMo4
1.7225	42CrMo4
1.7361	32CrMo12
1.2311	40CrMnMo7
1.2709	X3NiCrMoTi18 9 5
1.2376	X96CrMoV12
1.2601	X165CrMoV12
1.2609	X165CrVMo12 1

Acciai Legati, Acciai da Utensili (850-1400 N/mm2)
Alloy Steels, Tool Steels (N/mm2 850-1400)

Wrknr	DIN
1.2343	X38CrMoV5 1
1.2344	X40CrMoV5 1
1.2365	X32CrMoV3 3
1.2581	X30WCrV9 3
1.2080	X210Cr12
1.2379	X155CrMo12 1
1.2631	X50CrMoW9 1 1
1.2201	X165CrV12
1.2436	X210CrW12
1.2706	X3NiCrMo18 8 5
1.2880	X165CrCoMo12

Acciai Ferritici, Martensitici, PH SS (600-900 N/mm2)
Ferritic, Martensitic, PH SS (600-900 N/mm2)

Wrknr	AISI	Std	DIN
1.4742			X10CrAl18
1.4923			X22CrMoV12 1
1.4057	AISI 431		X20CrNi17 2
1.4000	AISI 403		X6Cr13
1.005	AISI 416		X12CrS13
1.4006	AISI 410		X10Cr13
1.4057	AISI 431		X20CrNi17 2
1.4104	AISI 430 F		X12CrMoS17
1.4113	AISI 434		X6CrMo17
1.4021	AISI 420		X20Cr13
1.4112	AISI 440 B		X90CrMoV18

Acciai Ferritici, Martensitici, PH SS, Induriti (900-1350 N/mm2)
High Strength Ferritic, Martensitic, PH SS (900-1350 N/mm2)

Wrknr	AISI	Std	DIN
1.4718			X45CrSi9 3
1.4021	AISI 420		X20Cr13
1.4112	AISI 440 B		X90CrMoV18
1.4125	AISI 440 C		X105CrMo17
1.4504		17-7 PH	
1.4545		15-5 PH	
1.4564		17-7 PH	
1.4542	AISI630	17-4 PH	X5CrNiCuNb16-4
1.4113	AISI 434		X6CrMo17
1.4021	AISI 420		X20Cr13
1.4112	AISI 440 B		X90CrMoV18

SS Acciai Inossidabili, Austenitici (130-200 HB)
Austenitic Stainless Steel (130-200 HB)

Wrknr	AISI	DIN
1.4878		X12CrNiTi18 9
1.4301	AISI 304	X5CrNi18 9
1.4303	AISI 308	X5CrNi18 12
1.4305	AISI 303	X10CrNiS18 9
1.4306	AISI 304 L	X2CrNi19 11
1.4310	AISI 301	X12CrNi17 7
1.4401	AISI 316	ZX5CrNiMo18 10
1.4404	AISI 316 L	X2CrNiMo17 13 2
1.4406	AISI 316 LN	X2CrNiMoN17 12 2
1.4435	AISI 316 L	X2CrNiMo18 14 3
1.4436	AISI 316	X5CrNiMo17 13 3
1.4438	AISI 317 L	X2CrNiMo18 16 4
1.4571	AISI 316 Ti	X6CrNiMoTi17 12 2
1.4573	AISI 316 Ti	X10CrNiMoTi18 12
1.4580	AISI 316 Cb	X6CrNiMoNb17 12 2
1.4583	AISI 318	X10CrNiMoNb18 12
1.4541	AISI 321	X6CrNiTi18 10
1.4550	AISI 347-348	X6CrNiNb18 10
1.4845	AISI 310S	X12CrNi25 21
1.4945		X6 CrNiWNb16 16
1.4962		X12CrNiWTi 16 3

SS Acciai Inossidabili, Austenitici, Induriti (150-230 HB)
High Strength Austenitic SS, Cast SS (150-230 HB)

Wrknr	AISI	DIN
1.4878		X12CrNiTi18 9
1.4301	AISI 304	X5CrNi18 9
1.4303	AISI 308	X5CrNi18 12
1.4305	AISI 303	X10CrNiS18 9
1.4306	AISI 304 L	X2CrNi19 11
1.4310	AISI 301	X12CrNi17 7
1.4401	AISI 316	ZX5CrNiMo18 10
1.4404	AISI 316 L	X2CrNiMo17 13 2
1.4406	AISI 316 LN	X2CrNiMoN17 12 2
1.4435	AISI 316 L	X2CrNiMo18 14 3
1.4436	AISI 316	X5CrNiMo17 13 3
1.4438	AISI 317 L	X2CrNiMo18 16 4
1.4571	AISI 316 Ti	X6CrNiMoTi17 12 2
1.4573	AISI 316 Ti	X10CrNiMoTi18 12
1.4580	AISI 316 Cb	X6CrNiMoNb17 12 2
1.4583	AISI 318	X10CrNiMoNb18 12
1.4541	AISI 321	X6CrNiTi18 10
1.4550	AISI 347-348	X6CrNiNb18 10
1.4845	AISI 310S	X12CrNi25 21
1.4945		X6 CrNiWNb16 16
1.4962		X12CrNiWTi 16 3

SS Duplex (135-275 HB)
Duplex SS (135-275 HB)

Wrknr	AISI	DIN
1.4460	AISI 329	X8CrNiMo27 5
	A240 (S31200)	
1.4410		
1.4462		

GG Ghisa Grigia (135-275 HB)
Grey Cast Iron (135-275 HB)

Wrknr	DIN
0.6010	GG-15
0.6015	GG-10
0.6020	GG-20
0.6030	GG-30

GS Ghisa Sferoidale (130-260 HB)
Low and Medium Strength CGI, Ductile Irons (130-260 HB)

Wrknr	DIN
0.6040	GG-40

GS Ghisa Sferoidale, Indurita (180-350 HB)
High Strength Ductile and Austempered Ductile Iron (180-350 HB)

Wrknr	DIN
0.6040	GG-40

Alluminio Puro
Wrought Aluminium

Wrknr	DIN
3.0205	Al99

Leghe di Alluminio a basso contenuto di Si, Leghe di Magnesio, Si<12%
Low Si Al Alloys and Magnesium Alloys Si<12%

Wrknr	DIN
3.0505	AlMn0.5Mg0.5
3.0506	AlMn0.6
3.0515	AlMn1
3.0517	AlMnCu
3.0525	AlMn1Mg0.5
3.0526	AlMn1Mg1
3.0915	AlFeSi
3.3307	Al99.85Mg0.5
3.3308	Al99.5Mg0.5
3.3315	AlMg1
3.3316	AlMg1.5
3.3317	Al99.85Mg1
3.3318	Al99.9Mg1
3.3326	AlMg1.8
3.3345	AlMg4.5
3.3523	AlMg2.5
3.3525	AlMg2Mn03
3.3527	AlMg2Mn0.8
3.3535	AlMg3
3.3537	AlMg2.7Mn
3.3545	AlMg4Mn
3.3547	AlMg4.5Mn
3.3549	AlMg5Mn
3.3555	AlMg5
3.0615	AlMgSiPb
3.1255	AlCuSiMn
3.1305	AlCu2.5Mg0.5
3.1325	AlCuMg1
3.1355	AlCuMg2
3.1645	AlCuMgPb
3.1655	AlCuBiPb
3.2307	Al99.85MgSi
3.2315	AlMgSi1
3.3206	AlMgSi0.5
3.3208	Al99.9MgSi
3.3210	AlMgSi0.7
3.3211	AlMg1SiCu
3.4335	AlZn4.5Mg1
3.4337	Al99.8ZnMg
3.4345	AlZnMgCu0.5
3.4365	AlZnMgCu1.5
3.1371	G-AlCu4TiMg

Leghe di Alluminio ad alto contenuto di Si, Si>12%
High Si Al Alloys Si>12%

Wrknr	DIN
	AlSi17Cu4Mg
	AlSi18CuNiMg
	AlSi21CuNiMg
	AlSi25CuNiMg

Rame, Ottone, Leghe a base di Zinco
Copper, Brass, Zinc Based Alloys

Wrknr	DIN
2.0040	OF-Cu
2.0205	CuZn0.5
2.0850	CuNi2Be
2.0220	CuZn5
2.0331	CuZn36Pb1.5
2.0730	CuNi12Zn24
2.0830	CuNi25

HRSA, Leghe a base di Fe
Iron Based HRSA

Wrknr	Std	DIN
1.4943	Z6NCTDV	X4NiCrTi 25 15
1.4980	A-286	X5NiCrTi

HRSA, Leghe a base di Co
Co Based HRSA

Wrknr	Std	DIN
	ASTM F75	Co28Cr6Mo
	ASTM F99	Co28Cr6Mo
	ASTM F90	Co20Cr15W10Ni
	ASTM F562	Co35Ni20Cr10Mo
	Alacrite 601	
	Alacrite 602	
	AMS 5759	

HRSA, Leghe a base di Ni
Ni Based HRSA

Wrknr	Std	DIN
1.4876	Incoloy 800	X10NiCrAlTi32 20
2.4360	Monel 400	NiCu30Fe
2.4375	Monel K500	NiCu30Al
2.4603	Hastelloy X	NiCr30FeMo
2.4617	Hastelloy B-2	
2.4630	Nimonic 75	NiCr20Ti
2.4631	Nimonic 80A	NiCr20TiAl
2.4634	Nimonic 105	NiCo20Cr15MoAlTi
2.4640	Inconel 600	NiCr15Fe
2.4668	Inconel 718	NiCr19Fe18Nb5Mg
2.4670	Nimocast 713	
2.4674	Nimocast PK24	
2.4816	Inconel 600	NiCr15Fe
2.4856	Inconel 625	NiCr22Mo9Nb
2.4858	Inconel 600	NiCr21Mo
2.4603	Hastelloy X	NiCr30FeMo
2.4617	Hastelloy B-2	
2.4632	Nimonic 90	NiCr20Co18Ti
2.4668	Inconel 718	NiCr19Fe18Nb5Mg
2.4670	Nimocast 713	
2.4674	Nimocast PK24	
2.4812	Hastelloy C	
2.4856	Inconel 625	NiCr22Mo9Nb
2.4983	Udimet 500	
	MAR-M200	
	MAR-M246	
	MAR-M302	
	MAR-M322	
	MAR-M432	
	MAR-M509	
2.4654	Rene 41	
	Rene 77	
	Rene 95	
	Rene 100	
	Rene 220	
	Stellite	
2.6554	Waspaloy	
	IN-738	

Titanio e Leghe a base di Titanio
Ti and Ti Alloys

Wrknr	DIN
3.7124	TiCu2
3.7144	TiAl6Sn2Zr4Mo2
3.7154	TiAl6Zr5
3.7165	TiAl6V4
3.7174	TiAl6V6Sn2
3.7184	TiAl4Mo4Sn2

Acciai temprati (44-48 HRC)
Hardened Materials (44-48 HRC)

Wrknr	AISI	DIN
		16MnCr5 (44-48HRC)
		34CrNiMo6 (44-48HRC)
		C75 (44-48HRC)
	1080 (44-48HRC)	

Acciai temprati (48-55 HRC)
Hardened Materials (48-55 HRC)

Wrknr	Commercial	DIN
		16MnCr5 (48-55HCR)
	D2 (48-55)	
		C80 (48-55HRC)
		Ck67 (48-55HRC)

Acciai temprati (56-60 HRC)
Hardened Materials (56-60 HRC)

Wrknr	AISI	DIN
	D2 (56-60HRC)	
		16MnCr5 (56-60HRC)
		C100S (56-60HRC)
		Ck67 (56-60HRC)

Materiali Termoplastici e Termoindurenti
Thermoplastic and Thermosetting Materials

Wrknr	DIN
P E	Baylon
P P	Daplen
P V C	Coroplast
P S	Hostyron
P M M A	Acrylglas
P T F E	Hostaflon
P A	Akulon
P C	Makralon
P I	
P F	Alberit
M F	Albanit
U F	Bakelite
P U R	Baydur
S I	Baysilon
U P	Alpolit
U P	Viapal
E P	Araldit
B F K	
C F K	
G F K	
M F K	
S F K	

Materiali Compositi (Fibre di Vetro)
Composite Materials (Glass Fibers)

Materiali Compositi (Fibre di Carbonio)
Composite Materials (Carbon Fibers)

Materiali Compositi (Fibre Aramidiche)
Composite Materials (Aramid Fibers)

Grafite
Graphite

Wrknr	Std	DIN
	IG-11	
	IG-45	
	IG - 70	
	ISO - 63	
	Technograph 30	

INDICE | INDEX

FORATURA
Hole making | Bohren | Perçage

Punte Pilota
Pilot drills

Codice | Code	Pag.
MTB27	30
MTB27E	32
TTD180E	34
TWP	36

Punte da Centro
Centering drills

Codice | Code	Pag.
MTB43	42
MTB44	42
MTB40	43
MTB41	43

Punte ad alto rendimento
High-permormance drills

Codice | Code	Pag.
TTD203	46
TTD207	48
TTD204	50
TTD209	52
TTD215	54
TTD206E	56
TTD212E	58
TTD218E	60
TTD203S	62
TTD206S	64

Punte
Drills

Codice | Code	Pag.
TA803	76
MTB25N	80
TA35	84
MTB25	85
MTB33	88
TA303B	90
TC35	91
MTB30	92
MTB35	94
MTB35L	96
MTB45	98
MTB50	100
MTB60	102

Alesatori
Reamers

Codice | Code	Pag.
MS402	104

FRESATURA
Milling | Fräsbearbeitung | Fraisage

Punte Pilota
Pilot drills

Codice | Code	Pag.
TTM225E Available also with corner-radius geometry (TTM225T)	122
TTM250E Available also with corner-radius geometry (TTM250T)	123
TMR230E	124
TMR250E	125
MS320	126
MS330	127
TTM325E Available also with corner-radius geometry (TTM325T)	128
TTM350E Available also with corner-radius geometry (TTM350T)	129
TWF3	130
TWF5	131

Punte Pilota
Pilot drills

Codice | Code	Pag.
MS122	140
MS122XL	141
MS122XLS	141
MS123	142
MS123XL	143
MS123XLS	143
MS124	144
MS131	146
MS131XL	147
MS131XLS	147
MS141	148
MS141XL	149
MS141XLS	149

SBAVATURA
Deburring | Entgraten | Ébavurage

Punte
Drills

Codice | Code	Pag.
TTMCA90	166
TTMCD90	166
TTMCR90	167

UTENSILI SPECIALI
Special tools | Sonderwerkzeuge | Outils spéciaux

Utensili in metallo duro | HM Tools	176
Utensili in ceramica | Ceramic tools	178

Notes

Notes

Progetto grafico di
Graphic design by
Grafikdesign von
Conception graphique par

Massimo Canali Studio
massimocanali.it

Stampato da
Printed by
Geddruckt von
Imprimé par

Marwan
marwan.it

Tusa Precision Tools SA
Via San Mamete 82
6805 Mezzovico-Vira
Switzerland

T +41 91 93 59 770
F +41 91 93 59 770
info@tusa-precision.ch
www.tusa-precision.ch



TUSA®
by PFERD TOOLS

Tusa Precision Tools SA
Via San Mamete 82
6805 Mezzovico-Vira
Switzerland

T +41 91 93 59 770
F +41 91 93 59 771
info@tusa-precision.ch
www.tusa-precision.ch

01-26/01-1500

Scansiona il codice QR
per visitare il nostro sito

Scan this QR code
to visit our website