



Clip-Groove®

Eintechsystem zum Außen- und Inneneinstechen

- Systemvorstellung
- Bezeichnungssystem
- Werkzeugauswahl
- Monoblockhalter – Außeneinstechen
- Bohrstangen – Inneneinstechen
- Geometrie
- Sortenbeschreibung
- Schneideinsätze
- Ersatzteile und Zubehör
- Schnittwerte
- Anwendungshinweise

Clip-Groove®

Grooving system for external and internal grooving

- Introduction
- Designation system
- Tool shank options
- Monoblock holders – External grooving
- Boring bars – Internal grooving
- Geometry
- Grade description
- Inserts
- Spare parts and accessories
- Cutting data
- Application reference

Clip-Groove®

Sistema per scanalatura esterna e interna

- Caratteristiche del sistema **188 – 189**
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Stechsystem mit dreischneidiger Schneidplatte für die radiale oder axiale Bearbeitung

Circlip grooving system for radial or axial application with 3-edged insert

Sistema di scanalatura con inserti a tre taglienti radiali o assiali

Monoblockhalter

Außeneinstecken

Monoblock holders

External grooving

Utensili monoblocco

di scanalatura esterna



Bohrstangen

Inneneinstecken

Boring bars

Internal grooving

Baren

di scanalatura interna



3-schneidige Schneideinsätze

3 edged inserts

Inserti a tre taglienti



Fakten

- Zwei Plattengrößen TNMU 17 und TNMU 31
- Einstechbreiten von 0,55 – 5 mm
- Einstechtiefe bis 3,5 mm möglich
- Verschiedene Formeinstiche mit nur einem Werkzeug möglich
- Einsatzbereich:
 - Radiuseinstiche
 - Seegeringnuten DIN 471/472
 - Einstechen
- Optimaler Form- und Kraftschluss der Schneideinsätze durch Schraubenklemmung
- 3-schneidige Schneideinsätze in verschiedenen Einstechbreiten
- Sonderprofile bis Stechbreite 7 mm möglich
- Schnelles Einspannen und Wechseln der Schneidplatten
- Clip-Groove® axial – speziell für Formeinstiche bei der Axialbearbeitung

Features

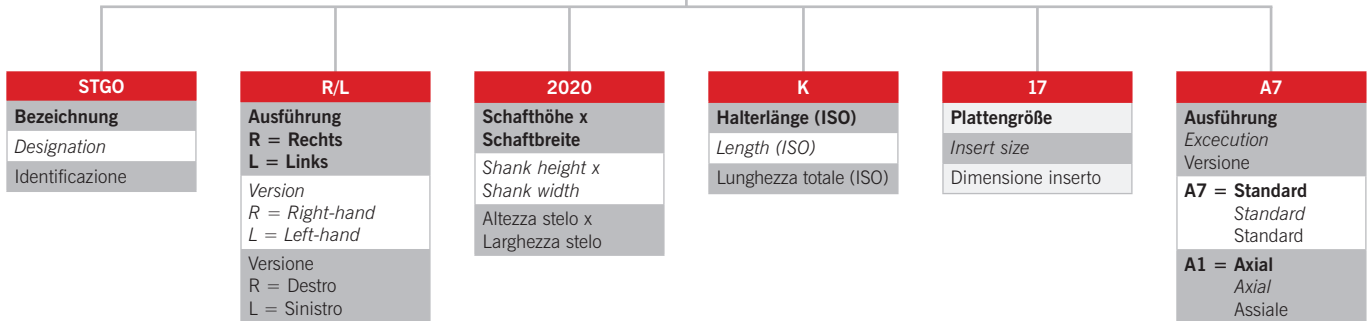
- *Two insert sizes TNMU 17 and TNMU 31*
- *Groove width from 0.55 to 5 mm*
- *Groove depth up to 3.5 mm*
- *Choice of groove forms for the same tool holder*
- *Application areas*
 - *Radius grooves*
 - *Cir-clip grooves DIN 471/472*
 - *Straight grooves*
- *Optimum clamping and insert location with screw clamping*
- *3 edged inserts*
- *Special profiles possible up to 7 mm width*
- *Quick change of inserts*
- *Clip-Groove® axial for face grooving*

Caratteristiche

- Due misure di inserti; TNMU 17 e TNMU 31
- Larghezza di taglio 0,55 a 5 mm
- Profondità di gola max 3,5 mm
- Diverse forme di gole con il medesimo utensile
- Inserti profilati specifici per:
 - Gole raggiate
 - Sedi seeger DIN 471/472
 - Gole decimali
- Insetto perfettamente bloccato a vite
- Inserti a tre taglienti con diverse larghezze
- Possibili profili speciali fino ad una larghezza di 7 mm
- Cambio e serraggio inserto facile e veloce
- Versione Clip-Groove® – specifico per lavorazioni assiali

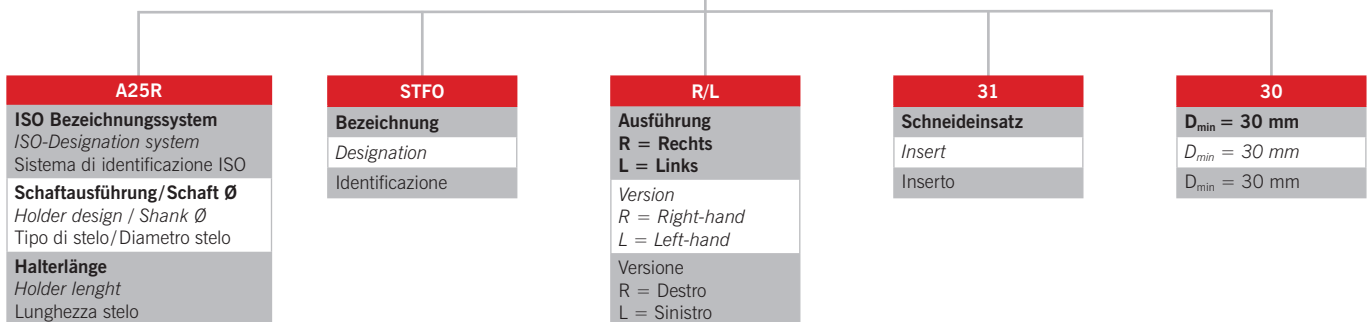
We have a passion for precision.

Monoblockhalter / Monoblock holders / Utensili monoblocco

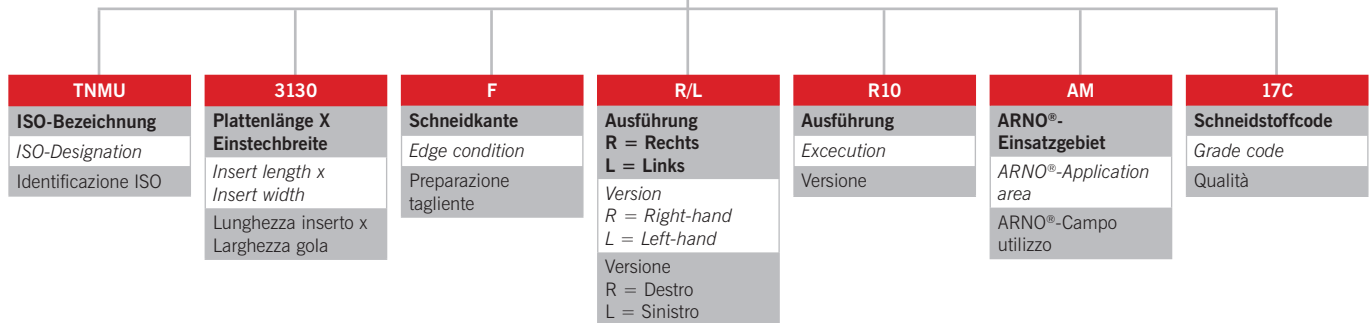


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Bohrstangen / Boring bars / Barenì



Schneideinsätze / Inserts / Inserti





Monoblockhalter – Außeneinstecken / *Monoblock holders – External grooving* / *Utensili monoblocco di scanalatura esterna*

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Bohrstangen – Inneneinstecken / *Boring bars – Internal grooving* / *Bareni di scanalatura interna*

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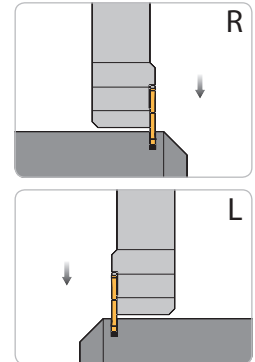
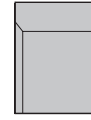
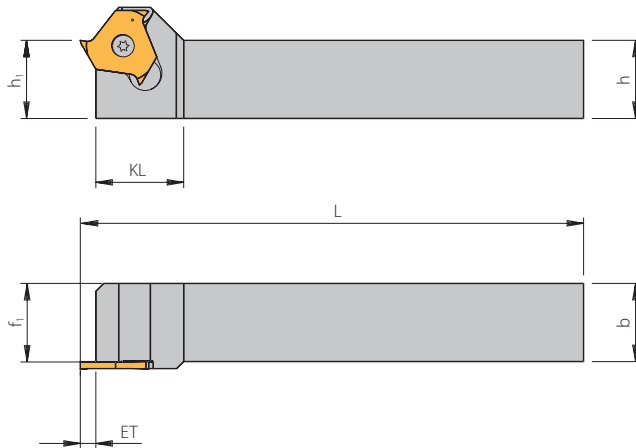
Schneideinsätze / *Inserts* / *Inserti*

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Radial-Steichen

Radial grooving
Scanalatura radiale



Rechte Ausführung abgebildet
Right-hand execution shown
Versione destra in figura

Bezeichnung Designation Articolo	ET	h	b	L	f ₁	h ₁	KL	Schneideinsatz Insert Inserto
STGO R/L 1010 E17-A7	2,0 ①	10	10	72,5	10,0	10	17,5	TNMU 17...
STGO R/L 1212 F17-A7	2,0 ①	12	12	82,5	12,0	12	17,5	TNMU 17...
STGO R/L 1616 J17-A7	2,0 ①	16	16	112,5	16,0	16	17,5	TNMU 17...
STGO R/L 1616 J17-A7/3 ②	2,0 ①	16	16	112,5	14,8	16	17,5	TNMU 17...
STGO R/L 2020 K17-A7	2,0 ①	20	20	127,5	20,0	20	17,5	TNMU 17...
STGO R/L 2020 K17-A7/3 ②	2,0 ①	20	20	127,5	18,8	20	17,5	TNMU 17...
STGO R/L 2525 M17-A7	2,0 ①	25	25	152,5	25,0	25	17,5	TNMU 17...
STGO R/L 2525 M17-A7/3 ②	2,0 ①	25	25	152,5	23,8	25	17,5	TNMU 17...
STGO R/L 1616 J31-A7	3,5 ②	16	16	114,0	16,0	16	22,5	TNMU 31...
STGO R/L 1616 J31-A7/4 ④	3,5 ②	16	16	114,0	13,8	16	22,5	TNMU 31...
STGO R/L 2020 K31-A7	3,5 ②	20	20	129,0	20,0	20	22,5	TNMU 31...
STGO R/L 2020 K31-A7/4 ④	3,5 ②	20	20	129,0	17,8	20	22,5	TNMU 31...
STGO R/L 2525 M31-A7	3,5 ②	25	25	154,0	25,0	25	22,5	TNMU 31...
STGO R/L 2525 M31-A7/4 ④	3,5 ②	25	25	154,0	22,8	25	22,5	TNMU 31...

- Bei Schneideinsätzen EB < 1,6 mm ist die Stechtiefe durch das Maß „t“ begrenzt.
Cutting depth is limited by the dimension "t" if cutting with EB < 1.6 mm for inserts.
Per gli inserti con EB < 1,6 mm, la profondità di taglio è limitata dalla quota "t".
- Bei Schneideinsätzen EB < 1,85 mm ist die Stechtiefe durch das Maß „t“ begrenzt.
Cutting depth is limited by the dimension "t" if cutting with EB < 1.85 mm for inserts.
Per gli inserti con EB < 1,85 mm, la profondità di taglio è limitata dalla quota "t".
- Für die Halter STGO R/L.../3 Schneideinsätze TNMU 1730F R/L, TNMU 1731F R/L, TNMU 1735F R/L und TNMU 1740F R/L verwenden!
For the toolholder STGO R/L.../3 inserts TNMU 1730F R/L, TNMU 1731F R/L, TNMU 1735F R/L and TNMU 1740F R/L must be used!
Per l'utensile STGO R/L.../3 utilizzare gli inserti TNMU 1730F R/L, TNMU 1731F R/L, TNMU 1735F R/L e TNMU 1740F R/L!
- Für die Halter STGO R/L.../4 Schneideinsätze TNMU 3140F R/L, TNMU 3145F R/L and TNMU 3150F R/L verwenden!
For the toolholder STGO R/L.../4 inserts TNMU 3140F R/L, TNMU 3145F R/L and TNMU 3150F R/L must be used!
Per l'utensile STGO R/L.../4 utilizzare gli inserti TNMU 3140F R/L, TNMU 3145F R/L e TNMU 3150F R/L!

Hinweis: Werkzeugsystem auch für Sonderprofile bis Stechbreite 7 mm geeignet.
Remark: Our tool-system can also be used for special profiles up to grooving width 7 mm.
Nota: Il nostro sistema può essere utilizzato per dei profili speciali fino ad una larghezza di scanalatura di 7 mm.

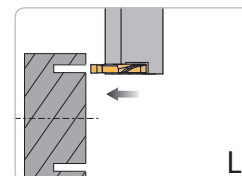
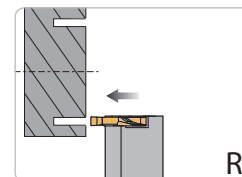
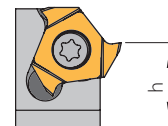
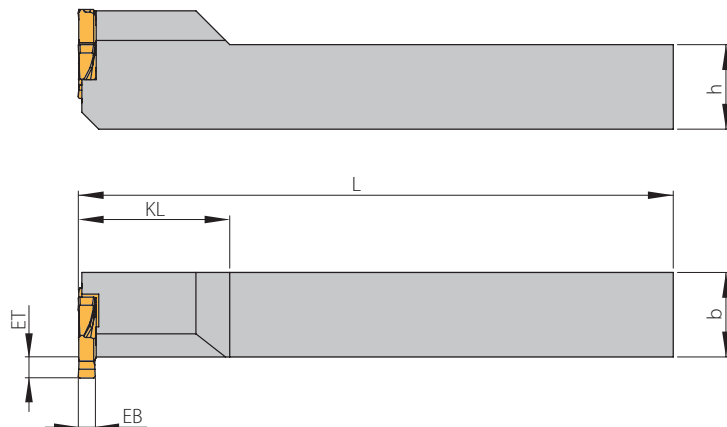
Ersatzteile / Spare parts / Ricambi

Halter Holder Stelo	Schraube Screw Vite	Schlüssel Key Chiave
STGO R/L ... K17-...	AS 0007	KS 1751
STGO R/L ... K31-...	AS 0002	KS 1111

Axial-Stecken

Axial grooving
Scanalatura assiale

We have a passion for precision.



Rechte Ausführung abgebildet
Right-hand execution shown
Versione destra in figura

Bezeichnung Designation Articolo	EB	ET	D _{min}	h	b	L	KL	Schneideinsatz Insert Inserto
STFO R/L 2020 K17-A1	1,0 – 2,0	1,5 – 2,0	10	20	20	125	17,5	TN MU 17...
STFO R/L 2020 K31-A1	1,5 – 2,5	2,0 – 3,0	20	20	20	125	22,5	TN MU 31...

Bitte beachten: Rechter Halter -> Linker Schneideinsatz, Linker Halter -> Rechter Schneideinsatz
Please note: Holder right-hand-design -> Left-hand insert, Holder left-hand-design -> Right-hand insert
Notare: Adattatore destro -> inserto sinistro, adattatore sinistro -> inserto destro

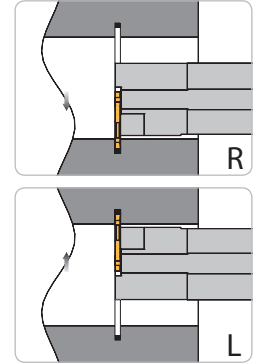
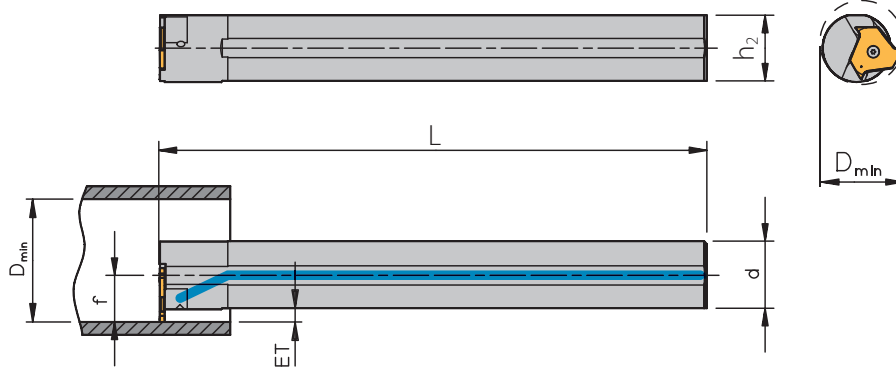
Ersatzteile / Spare parts / Ricambi

Halter Holder Stelo	Schraube Screw Vite	Schlüssel Key Chiave
STFO R/L ... K17-...	AS 0007	KS 1751
STFO R/L ... K31-...	AS 0002	KS 1111

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Innenstechen

Internal grooving
Scanalatura interna



Rechte Ausführung abgebildet
Right-hand execution shown
Versione destra in figura

Bezeichnung Designation Articolo	D _{min}	ET	d	h ₂	L	f	Schneideinsatz Insert Inserto
A12K STF0 R/L 1716 ⑤	16	2 ①	12	11	127	8,5	TN MU 17...
A12K STFOL 1716/3 ⑤	16	2 ①	12	11	128	8,5	TN MU 17...
A16M STF0 R/L 1716 ⑤	16	2 ①	16	15	152	8,5	TN MU 17...
A16M STF0 R/L 1716/3 ⑤	16	2 ①	16	15	153	8,5	TN MU 17...
A20Q STF0 R/L 1716 ⑤	16	2 ①	20	19	182	8,5	TN MU 17...
A20Q STF0 R/L 1725	23	2 ①	20	19	182	12,5	TN MU 17...
A20Q STF0 R/L 1725/3 ⑤	23	2 ①	20	19	183	12,5	TN MU 17...
A25R STF0 R/L 3130	30	4 ②	25	24	202	17,0	TN MU 31...
A25R STF0 R/L 3130/4 ④	30	4 ②	25	24	204	17,0	TN MU 31...
A32S STF0 R/L 3137	37	4 ②	32	30	252	20,5	TN MU 31...
A32S STF R/L 3137/4 ④	37	4 ②	32	30	254	20,5	TN MU 31...

- Bei Schneideinsätzen EB < 1,6 mm ist die Stechtiefe durch das Maß „t“ begrenzt.
Cutting depth is limited by the dimension "t" if cutting with EB < 1.6 mm for inserts.
Per gli inserti con EB < 1,6 mm, la profondità di taglio è limitata dalla quota "t".
- Bei Schneideinsätzen EB < 1,85 mm ist die Stechtiefe durch das Maß „t“ begrenzt.
Cutting depth is limited by the dimension "t" if cutting with EB < 1.85 mm for inserts.
Per gli inserti con EB < 1,85 mm, la profondità di taglio è limitata dalla quota "t".
- Für die Halter STF0 R/L.../3 Schneideinsätze TN MU 1730F R/L, TN MU 1731F R/L, TN MU 1735F R/L und TN MU 1740F R/L verwenden!
For the toolholder STF0 R/L.../3 inserts TN MU 1730F R/L, TN MU 1731F R/L, TN MU 1735F R/L and TN MU 1740F R/L must be used!
Per l'utensile STF0 R/L.../3 utilizzare gli inserti TN MU 1730F R/L, TN MU 1731F R/L, TN MU 1735F R/L e TN MU 1740F R/L!
- Für die Halter STF0 R/L.../4 Schneideinsätze TN MU 3140F R/L, TN MU 3145F R/L und TN MU 3150F R/L verwenden!
For the toolholder STF0 R/L.../4 inserts TN MU 3140F R/L, TN MU 3145F R/L and TN MU 3150F R/L must be used!
Per l'utensile STF0 R/L.../4 utilizzare gli inserti TN MU 3140F R/L, TN MU 3145F R/L e TN MU 3150F R/L!
- Nur bis Stechbreite EB = 2 mm
Only up to range of width EB = 2 mm
Solo da una larghezza di taglio EB = 2 mm

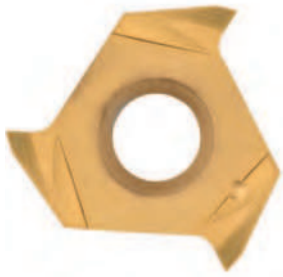
Hinweis: Bei Halter für TN MU..., Schneidkante 0,5 mm über Mitte.
Remark: With the support for the TN MU..., cutting edge 0.5 mm over centre.
Nota: Tutti i baren per TN MU hanno tagliente 0,5 mm sopra il centro.

Bitte beachten: Rechter Halter -> Linker Schneideinsatz, Linker Halter -> Rechter Schneideinsatz
Please note: Holder right-hand-design -> Left-hand insert, Holder left-hand-design -> Right-hand insert
Nota: Adattatore destro -> inserto sinistro, adattatore sinistro -> inserto destro

Ersatzteile / Spare parts / Ricambi

Halter Holder Stelo	Schraube Screw Vite	Schlüssel Key Chiave
STFO R/L ... K17-...	AS 0007	KS 1751
STFO R/L ... K31-...	AS 0002	KS 1111

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**TNMU 17**

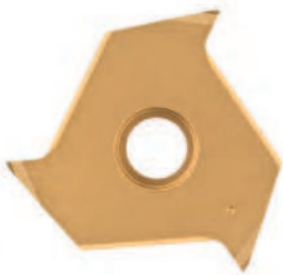
- 3-schneidig geschliffener Schneideinsatz
- Schneideinsatz für die Innen- und Außenbearbeitung
- verschiedene Formeinstiche

TNMU 17

- 3 edge ground insert
- for internal and external machining
- several forms

TNMU 17

- inserto intercambiabile a 3 taglienti
- inserto per lavorazione interna ed esterna
- diversi tipi di profilo gole

**TNMU 31**

- 3-schneidig geschliffener Schneideinsatz
- Schneideinsatz für die Innen- und Außenbearbeitung
- verschiedene Formeinstiche

TNMU 31

- 3 edge ground insert
- for internal and external machining
- several forms

TNMU 31

- inserto intercambiabile a 3 taglienti
- inserto per lavorazione interna ed esterna
- diversi tipi di profilo gole

**TNMU Axial**

- 3-schneidig geschliffener Schneideinsatz
- Schneideinsatz für die Außenbearbeitung
- verschiedene Formeinstiche

TNMU Axial

- 3 edge ground insert
- for external machining
- several forms

TNMU Assiale

- inserto intercambiabile a 3 taglienti
- inserto per lavorazione assiale
- diversi tipi di profilo gole

Beschichtet / Coated / Rivestito**AM17C**

CVD-Mehrlagenbeschichtung
Feinkorn-Hartmetallsorte für den universellen Einsatz in sämtlichen Werkstoffen, wie z. B. Stahl, rostfreiem Stahl.

CVD-multilayer coating
Submicron carbide grade for universal application of all materials, e. g. steel, stainless steel, cast iron and non-ferrous materials.

Rivestimento multistrato CVD
Grado di carburo micrograna per un'applicazione universale su tutti i tipi di materiali come acciai legati, inossidabili, ghisa grigia e sferoidale.

PVD2

PVD-Mehrlagenbeschichtung
Verschleißfeste Sorte mit guter Schneidkanten-sicherheit zur Bearbeitung von Nichteisenmetallen, wie z. B. Al und Al-Legierungen, Kupfer, Bronze und hochschmelzenden Werkstoffen unter ungünstigen Bearbeitungsbedingungen. Auch geeignet für die Zerspänung von Stahl und rostfreiem Stahl im unteren Schlichtbereich bei guten Bearbeitungsbedingungen.

PVD-multilayer coating
Wear resistant grade with good cutting edge stability for machining non-ferrous materials, e. g. Al and Al-alloys, copper brass and refractory metals under unfavourable machining conditions. Also suitable for finishing steel and stainless steel under favourable machining conditions.

Rivestimento multistrato PVD
Grado di carburo resistente all'usura, buona tenuta del tagliente, per la lavorazione di metalli non ferrosi (p. e. alluminio, leghe d'alluminio, rame, bronzo) e materiali refrattari (p. e. niobio, tantalio, molibdeno, tungsteno), in condizioni di taglio non favorevoli. Anche adatto alla finitura dell'acciaio e dell'acciaio inossidabile in buone condizioni di taglio.

Unbeschichtet / Uncoated / Non rivestito**AK10**

Feinkorn-Hartmetall zur Bearbeitung von Gusswerkstoffen, Leicht- und Buntmetallen, hochschmelzenden Metallen und gehärteten Stählen bis 55 HRC. In Verbindung mit der Spanleitstufengeometrie-ALU besonders für das Stechdrehen von Al- und Cu-Legierungen zu empfehlen.

Submicron carbide grade for machining cast materials, light and non-ferrous materials, refractory metals, hardened steels up to 55 HRC. In connection with chipbreaker-ALU specially suitable for machining Al- and Cu-alloys.

Grado submicrograna per la lavorazione di fusioni, leghe leggere e non ferrose, metalli refrattari, metalli temprati fino a 55 HRC. Abbinato al rompitrucciolo-ALU è specificamente adatto per la lavorazione leghe di alluminio e rame.

AK20

Hartmetallsorte mit höherer Zähigkeit zur Bearbeitung von Al und Al-Legierungen, Kupfer, Bronze, NE-Metalle und hochschmelzenden Werkstoffen bei mittleren Spanquerschnitten unter ungünstigen Bearbeitungsbedingungen, wie unterbrochene Schnitte.

A grade with great resilience for machining Al and Al-alloys, copper, brass, non-ferrous and refractory metals with medium chip cross sections under unfavourable machining conditions and interrupted cuts.

Un grado con grande resilienza per la lavorazione dell'Alluminio e sue leghe, ottone, rame, metalli non ferrosi e refrattari (p. e. niobio, tantalio, molibdeno, tungsteno) con sezioni di truciolo in condizioni di taglio non favorevoli e taglio interrotto.

CERMET

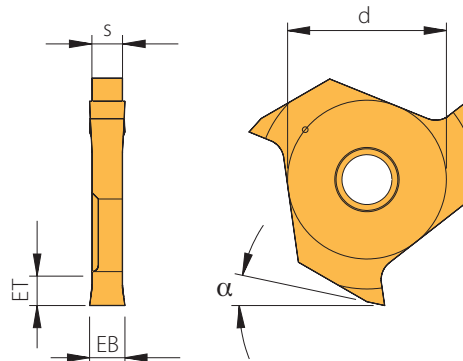
Bearbeitung von Stahl, Stählen mittlerer Festigkeit sowie rostfreiem Stahl und Gusseisen mit Kugelgraphit. Bedingt einsetzbar für Grauguss.

Machining of steel, steels with medium tensile strength as well as stainless steel and spheroidal cast iron. Limited use on grey cast iron.

Lavorazione dell'acciaio, acciai di durezza media come l'acciaio inossidabile e la ghisa sferoidale. Uso limitato sulla ghisa grigia.

TNMU 17

Schneideinsätze für Seegeringnuten nach DIN 471/472 / Inserts for circlip grooves to DIN 471/472 /
Inserti per gole sedi seeger DIN 471/472



Bezeichnung Designation Articolo	Sorten / Grades / Gradi									
	EB + 0,05	ET	d	s	α	beschichtet/ coated/rivestito		unbeschichtet/ uncoated/ non rivestito		
						AM17C	PVD2	AK10	AK20	CERMET
TNMU 1705F R/L	0,55	0,70	7,5	1,52	12°	●	●	●	●	
TNMU 1707F R/L	0,75	1,00	7,5	1,52	12°	●	●	●	●	
TNMU 1708F R/L	0,85	1,30	7,5	1,52	12°	●	●	●	●	
TNMU 1709F R/L	0,95	1,30	7,5	1,52	12°	●	●	●	●	
TNMU 1711F R/L	1,15	1,50	7,5	1,52	12°	●	●	●	●	
TNMU 1713F R/L	1,35	1,50	7,5	1,52	12°	●	●	●	●	
TNMU 1716F R/L	1,65	2,00	7,5	1,52	12°	●	●	●	●	
TNMU 1718F R/L	1,90	2,00	7,5	1,77	12°	●	●	●	●	
TNMU 1721F R/L	2,20	2,00	7,5	2,07	12°	●	●	●	●	●
TNMU 1726F R/L	2,70	2,00	7,5	2,57	12°	●	●	●	●	●
TNMU 1731F R/L	3,20	2,00	7,5	3,07	12°	●	●	●	●	●

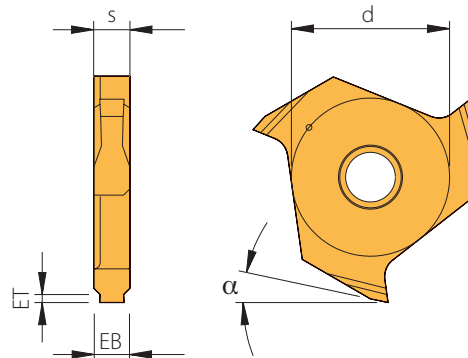
	P	M	K	N	S	H
● Hauptanwendung Main application Applicazione principale	●	○				●
○ Nebenanwendung Secondary application Applicazione secondaria		○				○
			●	●	○	○
		●		●	○	
	○				○	

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TNMU 17

Schneideinsätze für Seegeringnuten nach DIN 471/472 Vollprofil / Inserts for circlip grooves to DIN 471/472 full profil /
Inserti per gole sedi seeger DIN 471/472 profilo completo



Bezeichnung Designation Articolo	Sorten / Grades / Gradi										
							beschichtet/ coated/rivestito		unbeschichtet/ uncoated/ non rivestito		
	EB + 0,05	ET	d	s	α	AM17C	PVD2	AK10	AK20	CERMET	
TNMU 1711F R/L-V020	1,15	0,20	7,5	1,77	12°	●		●			
TNMU 1711F R/L-V025	1,15	0,25	7,5	1,77	12°	●		●			
TNMU 1711F R/L-V030	1,15	0,30	7,5	1,77	12°	●		●			
TNMU 1711F R/L-V035	1,15	0,35	7,5	1,77	12°	●		●			
TNMU 1711F R/L-V040	1,15	0,40	7,5	1,77	12°	●		●			
TNMU 1713F R/L-V055	1,35	0,55	7,5	2,07	12°	●		●			
TNMU 1716F R/L-V070	1,65	0,70	7,5	2,57	12°	●		●			
TNMU 1716F R/L-V085	1,65	0,85	7,5	2,57	12°	●		●			
TNMU 1716F R/L-V100	1,65	1,00	7,5	2,57	12°	●		●			
TNMU 1718F R/L-V100	1,90	1,00	7,5	3,07	12°	●		●			
TNMU 1718F R/L-V125	1,90	1,25	7,5	3,07	12°	●		●			

- Hauptanwendung
Main application
Applicazione principale
- Nebenanwendung
Secondary application
Applicazione secondaria

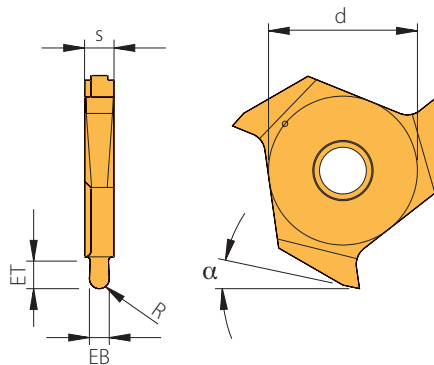
P	●	
M	●	
K		●
N		●
S	○	○
H		

4

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TNMU 17

Schneideinsätze Vollradius / Full radius inserts / Inserti per gole a raggio completo



Bezeichnung Designation Articolo	EB ± 0,02	R	ET	d	s	α	Sorten / Grades / Gradi				
							beschichtet/ coated/rivestito		unbeschichtet/ uncoated/ non rivestito		
							AM17C	PVD2	AK10	AK20	CERMET
TNMU 1710F R/L-R05	1,0	0,5	1,00	7,5	1,52	12°	●	●	●	●	
TNMU 1720F R/L-R10	2,0	1,0	1,50	7,5	2,57	12°	●	●	●	●	●

● Hauptanwendung
Main application
Applicazione principale

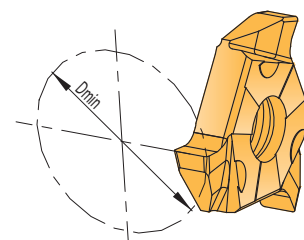
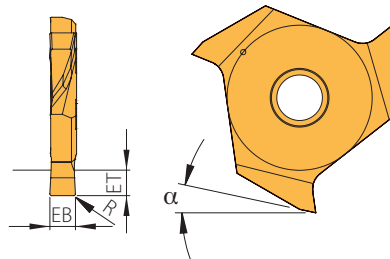
○ Nebenanwendung
Secondary application
Applicazione secondaria

P	●	○			●
M	●	○			○
K			●	●	○
N		●	●	●	
S	○		○	○	
H					

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TNMU 17

Schneideinsätze Axial / Inserts axial / Inserti per gole assiali



Bezeichnung Designation Articolo	Sorten / Grades / Gradi					beschichtet/ coated/rivestito		unbeschichtet/ uncoated/ non rivestito		
	EB	R	ET	D _{min}	α	AM17C	PVD2	AK10	AK20	CERMET
TNMU 1710F R/L-AX10	1,0	0,1	1,50	10	12°		●		●	
TNMU 1715F R/L-AX10	1,5	0,1	2,00	10	12°		●		●	
TNMU 1720F R/L-AX10	2,0	0,2	2,00	10	12°		●		●	

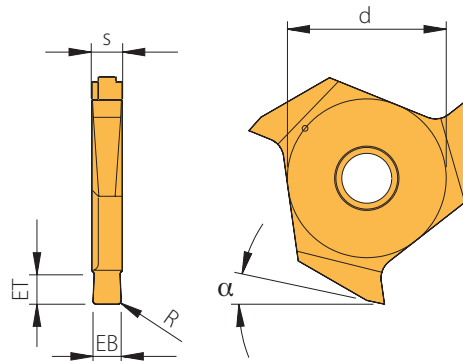
- Hauptanwendung
Main application
Applicazione principale
- Nebenanwendung
Secondary application
Applicazione secondaria

P	○		
M	○		
K			●
N	●		●
S			○
H			

4

TNMU 17

Schneideinsätze Geradmaße / Inserts with straight dimensions / Inserti per canali dimensioni decimali



Bezeichnung Designation Articolo	EB ± 0,02	R	ET	d	s	α	Sorten / Grades / Gradi				
							beschichtet/ coated/rivestito		unbeschichtet/ uncoated/ non rivestito		
							AM17C	PVD2	AK10	AK20	CERMET
TNMU 1715F R/L	1,5	0,1	1,80	7,5	1,77	12°	●	●	●	●	●
TNMU 1720F R/L	2,0	0,1	1,80	7,5	2,07	12°	●	●	●	●	●
TNMU 1725F R/L	2,5	0,2	1,80	7,5	2,57	12°	●	●	●	●	●
TNMU 1730F R/L	3,0	0,2	1,80	7,5	3,07	12°	●	●	●	●	●
TNMU 1735F R/L	3,5	0,2	1,80	7,5	3,57	12°	●	●	●	●	●
TNMU 1740F R/L	4,0	0,2	1,80	7,5	4,37	12°	●	●	●	●	●

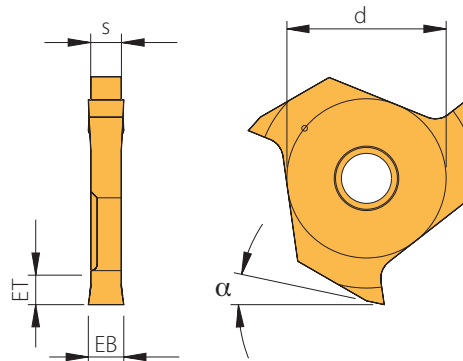
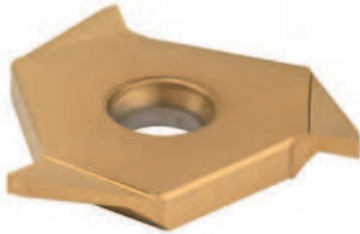
Hinweis: Ab Schneideinsatz TNMU 1730 F R/L den Halter STGO R/L/3 verwenden!
 Remark: For inserts from TNMU 1730F R/L the toolholder STGO R/L/3 must be used!
 Nota: Per gli inserti a partire da TNMU 1730F R/L deve essere utilizzato il adattatore STGO R/L /3!

	P	M	K	N	S	H
● Hauptanwendung Main application Applicazione principale	●	○				●
○ Nebenanwendung Secondary application Applicazione secondaria				●	○	○

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TNMU 31

Schneideinsätze für Seegeringnuten nach DIN 471/472 / Inserts for circlip grooves as to DIN 471/472 /
Inserti per gole sedi seeger DIN 471/472



Bezeichnung Designation Articolo	Sorten / Grades / Gradi									
	EB + 0,05	ET	d	s	α	beschichtet/ coated/rivestito		unbeschichtet/ uncoated/ non rivestito		
						AM17C	PVD2	AK10	AK20	CERMET
TNMU 3105F R/L	0,55	0,70	14,0	2,56	14°	●	●	●	●	
TNMU 3107F R/L	0,75	1,00	14,0	2,56	14°	●	●	●	●	
TNMU 3108F R/L	0,85	1,90	14,0	2,56	14°	●	●	●	●	
TNMU 3109F R/L	0,95	2,00	14,0	2,56	14°	●	●	●	●	
TNMU 3111F R/L	1,15	2,00	14,0	2,56	14°	●	●	●	●	
TNMU 3113F R/L	1,35	2,00	14,0	2,56	14°	●	●	●	●	
TNMU 3116F R/L	1,65	2,00	14,0	2,56	14°	●	●	●	●	
TNMU 3118F R/L	1,90	3,50	14,0	2,56	14°	●	●	●	●	
TNMU 3121F R/L	2,20	3,50	14,0	2,56	14°	●	●	●	●	●
TNMU 3126F R/L	2,70	3,50	14,0	2,56	14°	●	●	●	●	●
TNMU 3131F R/L	3,20	3,50	14,0	3,06	14°	●	●	●	●	●

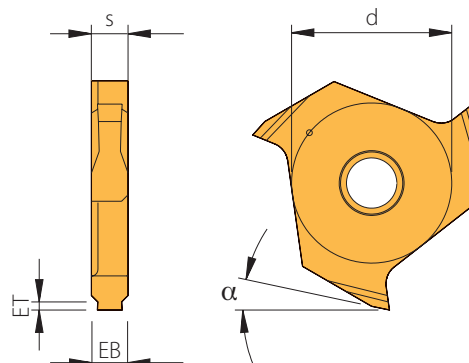
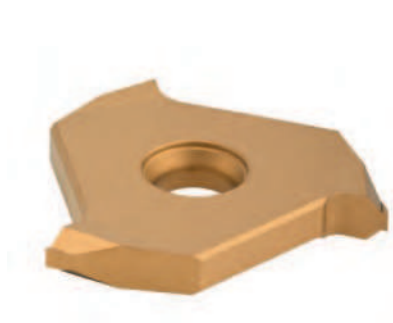
- Hauptanwendung
Main application
Applicazione principale
- Nebenanwendung
Secondary application
Applicazione secondaria

	P	M	K	N	S	H
AM17C	●	○				
PVD2	○	○		●		
AK10			●	●	○	
AK20				●	○	
CERMET						●

4

TNMU 31

Schneideinsätze für Seegeringnuten nach DIN 471/472 Vollprofil / Inserts for circlip grooves as to DIN 471/472 full profile /
Inserti per gole sedi seeger DIN 471/472 profilo completo



Bezeichnung Designation Articolo	Sorten / Grades / Gradi									
							beschichtet/ coated/rivestito		unbeschichtet/ uncoated/ non rivestito	
	EB + 0,05	ET	d	s	α	AM17C	PVD2	AK10	AK20	CERMET
TNMU 3111F R/L-V020	1,15	0,20	14,0	2,56	14°	●		●		
TNMU 3111F R/L-V025	1,15	0,25	14,0	2,56	14°	●		●		
TNMU 3111F R/L-V030	1,15	0,30	14,0	2,56	14°	●		●		
TNMU 3111F R/L-V035	1,15	0,35	14,0	2,56	14°	●		●		
TNMU 3111F R/L-V040	1,15	0,40	14,0	2,56	14°	●		●		
TNMU 3113F R/L-V055	1,35	0,55	14,0	2,56	14°	●		●		
TNMU 3116F R/L-V070	1,65	0,70	14,0	2,56	14°	●		●		
TNMU 3116F R/L-V085	1,65	0,85	14,0	2,56	14°	●		●		
TNMU 3116F R/L-V100	1,65	1,00	14,0	2,56	14°	●		●		
TNMU 3118F R/L-V100	1,90	1,00	14,0	3,06	14°	●		●		
TNMU 3118F R/L-V125	1,90	1,25	14,0	3,06	14°	●		●		
TNMU 3121F R/L-V150	2,20	1,50	14,0	3,56	14°	●		●		
TNMU 3126F R/L-V150	2,70	1,50	14,0	4,36	14°	●		●		
TNMU 3126F R/L-V175	2,70	1,75	14,0	4,36	14°	●		●		
TNMU 3131F R/L-V175	3,20	1,75	14,0	4,91	14°	●		●		

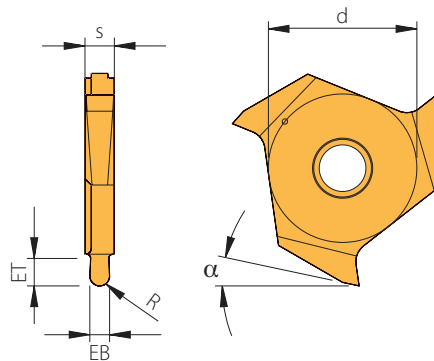
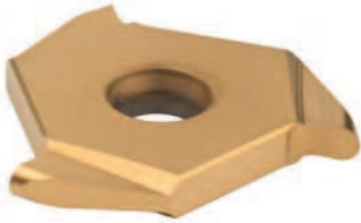
● Hauptanwendung
Main application
Applicazione principale

○ Nebenanwendung
Secondary application
Applicazione secondaria

P	●	
M	●	
K		●
N		●
S	○	○
H		

TNMU 31

Schneideinsätze Vollradius / Full radius inserts / Inserti per gole a raggio completo



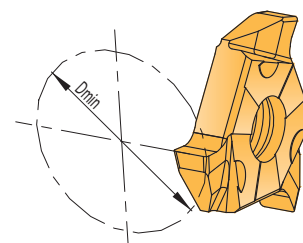
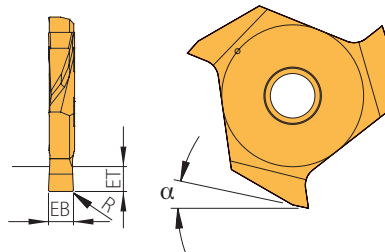
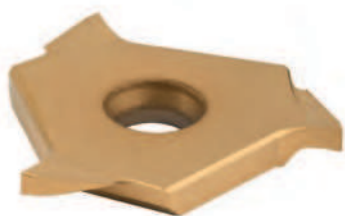
Bezeichnung Designation Articolo	EB ± 0,02	R	ET	d	s	α	Sorten / Grades / Gradi				
							beschichtet/ coated/rivestito		unbeschichtet/ uncoated/ non rivestito		
							AM17C	PVD2	AK10	AK20	CERMET
TNMU 3120F R/L-R10	2,0	1,0	3,00	14,0	2,56	14°	●	●	●	●	●
TNMU 3130F R/L-R15	3,0	1,5	3,00	14,0	3,56	14°	●	●	●	●	●
TNMU 3140F R/L-R20	4,0	2,0	3,00	14,0	4,36	14°	●	●	●	●	●

- Hauptanwendung
Main application
Applicazione principale
- Nebenanwendung
Secondary application
Applicazione secondaria

	P	M	K	N	S	H
AM17C	●	○				
PVD2	○	○				
AK10			●	●	○	
AK20			●	●	○	
CERMET						●

TNMU 31

Schneideinsätze Axial / Inserts axial / Inserti per gole assiali



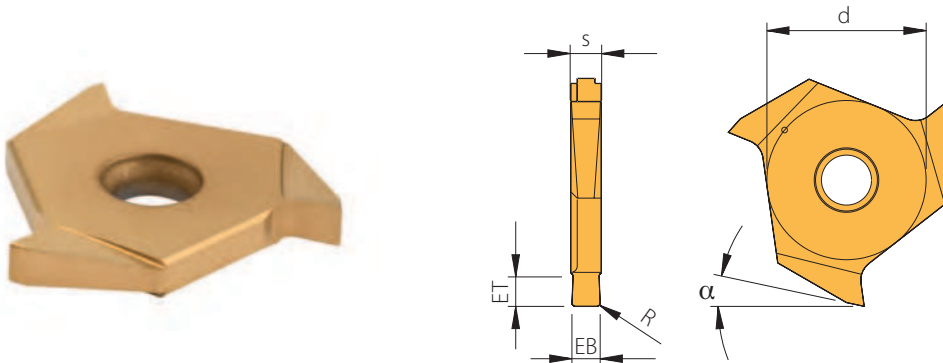
Bezeichnung Designation Articolo	Sorten / Grades / Gradi									
						beschichtet/ coated/rivestito		unbeschichtet/ uncoated/ non rivestito		
	EB	R	ET	D _{min}	α	AM17C	PVD2	AK10	AK20	CERMET
TNMU 3115F R/L-AX20	1,5	0,1	2,00	20	12°		●		●	
TNMU 3120F R/L-AX20	2,0	0,2	3,00	20	12°		●		●	
TNMU 3125F R/L-AX20	2,5	0,2	3,00	20	12°		●		●	

● Hauptanwendung Main application Applicazione principale	P	○			
	M	○			
○ Nebenanwendung Secondary application Applicazione secondaria	K			●	
	N	●		●	
	S			○	
	H				

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TNMU 31

Schneideinsätze Geradmaße / Inserts with straight dimensions / Inserti per canali dimensioni decimali



Bezeichnung Designation Articolo	Sorten / Grades / Gradi										
							beschichtet/ coated/rivestito		unbeschichtet/ uncoated/ non rivestito		
	EB ± 0,02	R	ET	d	s	α	AM17C	PVD2	AK10	AK20	CERMET
TNMU 3120F R/L	2,0	0,1	3,00	14,0	2,56	14°	●	●	●	●	●
TNMU 3125F R/L	2,5	0,2	3,00	14,0	2,56	14°	●	●	●	●	●
TNMU 3130F R/L	3,0	0,2	3,00	14,0	3,06	14°	●	●	●	●	●
TNMU 3135F R/L	3,5	0,2	3,00	14,0	3,56	14°	●	●	●	●	●
TNMU 3140F R/L	4,0	0,2	3,00	14,0	4,36	14°	●	●	●	●	●
TNMU 3145F R/L	4,5	0,2	3,00	14,0	4,91	14°	●		●		
TNMU 3150F R/L	5,0	0,2	3,00	14,0	4,91	14°	●		●		

Hinweis: Für Schneideinsatz TNMU 3140F R/L, TNMU 3145F R/L und TNMU 3150F R/L den Halter STGO R/L.../4 oder STFO R/L.../4 verwenden!

Remark: For inserts TNMU 3140F R/L, TNMU 3145F R/L and TNMU 3150F R/L the toolholder STGO R/L .../4 or STFO R/L .../4 must be used!

Nota: Per gli inserti TNMU 3140F R/L, TNMU 3145F R/L e TNMU 3150F R/L, utilizzare il adattatore STGO R/L .../4 o STFO R/L .../4!

● Hauptanwendung

Main application
Applicazione principale

○ Nebenanwendung

Secondary application
Applicazione secondaria

P	●	○			●
M	●	○			○
K			●	●	○
N		●	●	●	
S	○		○	○	
H					

4

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Artikel / Item / Articolo
Schraube / Screw / Vite
AS0002
AS0007
Schlüssel / Key / Chiave
KS1111
KS1751

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Stechen

ISO	Werkstoff	Zugfestigkeit (N/mm ²)	Schnittgeschwindigkeit V _c (m/min)					
			beschichtet		unbeschichtet			
			AM17C	PVD2	AK10	AK20	CERMET	
P	Unlegierter Stahl und Stahlguss	< 0,15 % C/vergütet	350	140-180	100-130	-	-	130-400
		0,15 - 0,45 % C/vergütet	650	110-160	-	-	-	120-350
		> 0,45 % C/vergütet	1000	80-120	60-100	-	-	80-275
	Niedrig legierter Stahl und Stahlguss	geglüht	600	90-130	70-110	-	-	100-250
		vergütet	900	80-120	60-100	-	-	90-230
			1200	70-90	50-70	-	-	60-150
	Hochlegierter Stahl	geglüht	700	90-140	70-110	-	-	80-180
Hochlegierter Werkzeugstahl und Stahlguss	gehärtet und angelassen	1100	70-90	50-70	-	-	60-140	
Nichtrostender Stahl	ferritisch, geglüht	700	160-220	130-200	-	-	80-220	
Stahlguss	martensitisch, vergütet	1000	70-110	60-90	-	-	70-180	
M	Nichtrostender Stahl	austenitisch und austenitisch/ ferritisch, abgeschreckt	450-600	100-160	130-200	-	-	100-250
		600-900	70-120	60-90	-	-	80-180	
K	Grauguss	perlitisch/ferritisch	500-700	180-220	140-180	100-180	100-180	-
		perlitisch/martensitisch	700-850	140-180	110-140	90-120	90-120	-
			800-1100	160-180	100-140	80-120	80-120	-
	Gusseisen mit Kugelgraphit	ferritisch	550	160-200	120-160	100-140	100-160	220-300
		perlitisch	800	120-180	100-140	80-120	70-120	180-230
Temperguss	ferritisch	450	180-240	140-200	70-90	80-180	250-350	
	perlitisch	750	160-200	120-160	60-70	70-150	160-250	
N	Aluminium-Knetlegierungen	nicht aushärtbar	200	100-1000	100-800	650-1000	100-800	-
		aushärtbar, ausgehärtet	350	100-800	100-600	300-700	80-800	-
	Aluminium-Gusslegierungen	≤ 12 % Si, ausgehärtet	250	100-500	100-400	200-600	80-800	-
		≤ 12 % Si, aushärtbar, ausgehärtet	300	100-500	100-400	150-400	-	-
		≤ 12 % Si, nicht aushärtbar	450	100-500	100-400	100-300	-	-
	Kupfer und Kupferlegierungen (Bronze/Messing)	Automatenlegierung, Pb > 1 %	400	80-300	80-300	250-600	80-250	-
Messing, Rotguss		300	-	150-600	205-400	150-500	-	
Aluminiumbronze		500	-	100-400	250-500	100-300	-	
Kupfer und Elektrolytkupfer		200	-	80-300	130-300	80-250	-	
Nichtmetallische Werkstoffe	Duroplaste	-	80-500	80-400	80-500	100-500	-	
	Faserverstärkte Kunststoffe	-	80-200	80-160	60-150	50-150	-	
	Hartgummi	-	-	100-300	100-250	100-300	-	
S	Warmfeste Legierungen	Fe-Basis, geglüht	700	30-50	25-40	10-30	30-40	-
		Fe-Basis, ausgehärtet	950	25-30	20-28	15-30	25-35	-
		Ni- oder Co-Basis, geglüht	800	15-25	12-20	15-30	15-25	-
		Ni- oder Co-Basis, gegossen	1100	10-25	8-16	-	10-20	-
		Ni- oder Co-Basis, ausgehärtet	1200	10-20	8-20	-	10-20	-
	Titanlegierungen	Rein-Titan	500-700	-	-	15-50	100-150	-
Alpha+Beta-Legierungen	ausgehärtet	700-1000	-	-	40-70	40-70	-	
H	Gehärteter Stahl	gehärtet und angelassen	55 HRC	-	-	-	-	-
			60 HRC	-	-	-	-	-
	Hartguss	gegossen	41 HRC	-	-	-	-	-
	Gehärtetes Gusseisen	gehärtet und angelassen	55 HRC	-	-	-	-	-

Die Tabellenwerte sind Richtwerte.
Es kann notwendig sein, die Werte den jeweiligen Bearbeitungsumständen anzupassen.



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Grooving

ISO	Material	Tensile strength (N/mm ²)	Cutting speed V _c (m/min)					
			coated		uncoated			
			AM17C	PVD2	AK10	AK20	CERMET	
P	Unalloyed steel and cast steel	< 0.15% C/hardened and tempered	350	140-180	100-130	-	-	130-400
		0.15-0.45% C/hardened and tempered	650	110-160	-	-	-	120-350
		> 0.45% C/hardened and tempered	1000	80-120	60-100	-	-	80-275
	Low alloyed steel and cast steel	annealed	600	90-130	70-110	-	-	100-250
		hardened and tempered	900	80-120	60-100	-	-	90-230
			1200	70-90	50-70	-	-	60-150
	High alloyed steel	annealed	700	90-140	70-110	-	-	80-180
	High alloyed tool steel and cast steel	hardened	1100	70-90	50-70	-	-	60-140
Stainless steel	ferritic, annealed	700	160-220	130-200	-	-	80-220	
Cast steel	martensitic, hardened and tempered	1000	70-110	60-90	-	-	70-180	
M	Stainless steel	austenitic and austenitic/ ferritic, chilled	450-600	100-160	130-200	-	-	100-250
			600-900	70-120	60-90	-	-	80-180
K	Cast iron	pearlitic/ferritic	500-700	180-220	140-180	100-180	100-180	-
		pearlitic/martensitic	700-850	140-180	110-140	90-120	90-120	-
			800-1100	160-180	100-140	80-120	80-120	-
	Cast iron with nodular graphite	ferritic	550	160-200	120-160	100-140	100-160	220-300
		pearlitic	800	120-180	100-140	80-120	70-120	180-230
	Malleable cast iron	ferritic	450	180-240	140-200	70-90	80-180	250-350
N	Aluminium alloys long chipping	not heat treatable	200	100-1000	100-800	650-1000	100-800	-
		heat treatable, heat treated	350	100-800	100-600	300-700	80-800	-
	Casted aluminium alloys	≤ 12% Si, heat treated	250	100-500	100-400	200-600	80-800	-
		≤ 12% Si, heat treatable, heat treated	300	100-500	100-400	150-400	-	-
		≤ 12% Si, not heat treatable	450	100-500	100-400	100-300	-	-
	Copper and copper alloys (Brass/Bronze)	Lead alloys, Pb > 1%	400	80-300	80-300	250-600	80-250	-
		Brass, Bronze	300	-	150-600	205-400	150-500	-
Aluminium bronze		500	-	100-400	250-500	100-300	-	
Copper and elektrolyte copper		200	-	80-300	130-300	80-250	-	
Non-ferrous materials	Duroplastic	-	80-500	80-400	80-500	100-500	-	
	Re-inforced plastics	-	80-200	80-160	60-150	50-150	-	
	Hard rubber	-	-	100-300	100-250	100-300	-	
S	High temperature resistant alloys	Fe-alloyed, annealed	700	30-50	25-40	10-30	30-40	-
		Fe-alloyed, heat treated	950	25-30	20-28	15-30	25-35	-
		Ni- or Co-alloyed, annealed	800	15-25	12-20	15-30	15-25	-
		Ni- or Co-alloyed, casting	1100	10-25	8-16	-	10-20	-
		Ni- or Co-alloyed, heat treated	1200	10-20	8-20	-	10-20	-
	Titanium alloys	Pure titan	500-700	-	-	15-50	100-150	-
Alpha- and Beta-alloys	heat treated	700-1000	-	-	40-70	40-70	-	
H	Hardened steel	hardened	55 HRC	-	-	-	-	-
			60 HRC	-	-	-	-	-
	Hard cast iron	casting	41 HRC	-	-	-	-	-
	Hardened cast iron	hardened	55 HRC	-	-	-	-	-

The recommended cutting data are only approximate values.
It may be necessary to adjust them to each individual machining application.

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Scanalatura


ISO	Materiale	Resistenza (N/mm ²)	Velocità di taglio Vc (m/min)					
			rivestito		non rivestito			
			AM17C	PVD2	AK10	AK20	CERMET	
P	Acciai non legati	< 0,15 % C/bonificato	350	140-180	100-130	-	-	130-400
		0,15 - 0,45 % C/bonificato	650	110-160	-	-	-	120-350
		> 0,45 % C/bonificato	1000	80-120	60-100	-	-	80-275
	Acciai debolmente legati e Ghise acciaiose	ricotto	600	90-130	70-110	-	-	100-250
		bonificato	900	80-120	60-100	-	-	90-230
			1200	70-90	50-70	-	-	60-150
	Acciai fortemente legati	ricotto	700	90-140	70-110	-	-	80-180
	Acciai da utensili e fusioni	temprato e rinvenuto	1100	70-90	50-70	-	-	60-140
	Acciai inossidabili	ferritico, ricotto	700	160-220	130-200	-	-	80-220
Ghisa acciaiosa	martensitico, bonificato	1000	70-110	60-90	-	-	70-180	
M	Acciai inossidabili	austenitico e autenitico/	450-600	100-160	130-200	-	-	100-250
		ferritico, trattato o temperato	600-900	70-120	60-90	-	-	80-180
K	Ghisa grigia	perlitica/ferritico	500-700	180-220	140-180	100-180	100-180	-
		perlitica/martensitico	700-850	140-180	110-140	90-120	90-120	-
			800-1100	160-180	100-140	80-120	80-120	-
	Ghisa sferoidale	ferritico	550	160-200	120-160	100-140	100-160	220-300
		perlitica	800	120-180	100-140	80-120	70-120	180-230
	Ghisa temprata	ferritico	450	180-240	140-200	70-90	80-180	250-350
perlitica		750	160-200	120-160	60-70	70-150	160-250	
N	Leghe di Alluminio stampato	non invecchiato	200	100-1000	100-800	650-1000	100-800	-
		invecchiato	350	100-800	100-600	300-700	80-800	-
	Leghe di Alluminio da fusione	≤ 12 % Si, invecchiato	250	100-500	100-400	200-600	80-800	-
		≤ 12 % Si, rinvenuto, invecchiato	300	100-500	100-400	150-400	-	-
		≤ 12 % Si, non invecchiato	450	100-500	100-400	100-300	-	-
	Rame e Leghe di Rame (Bronzo/Ottone)	Automatici, Pb > 1 %	400	80-300	80-300	250-600	80-250	-
		Ottone, Bronzo	300	-	150-600	205-400	150-500	-
Bronzoalluminio		500	-	100-400	250-500	100-300	-	
Rame e Rame Elettrolitico		200	-	80-300	130-300	80-250	-	
Materiali non metallici	Duroplastiche	-	80-500	80-400	80-500	100-500	-	
	Plastiche rinforzate	-	80-200	80-160	60-150	50-150	-	
	Gomme dure	-	-	100-300	100-250	100-300	-	
S	Leghe resistenti al calore	Base-Fe, ricotto	700	30-50	25-40	10-30	30-40	-
		Base-Fe, invecchiato	950	25-30	20-28	15-30	25-35	-
		Base Ni o Co, ricotto	800	15-25	12-20	15-30	15-25	-
		Base Ni o Co, da fusione	1100	10-25	8-16	-	10-20	-
		Base Ni o Co, invecchiato	1200	10-20	8-20	-	10-20	-
	Leghe di Titanio	Titanio puro	500-700	-	-	15-50	100-150	-
Leghe Alpha+Beta	invecchiato	700-1000	-	-	40-70	40-70	-	
H	Acciaio Temprato	temprato e rinvenuto	55 HRC	-	-	-	-	-
			60 HRC	-	-	-	-	-
	Getti Temprati	da fusione	41 HRC	-	-	-	-	-
	Ghisa Temprata	temprato e rinvenuto	55 HRC	-	-	-	-	-

I dati indicati in tabella sono valori approssimati. Può essere necessario adattarli alle singole applicazioni di lavorazione.

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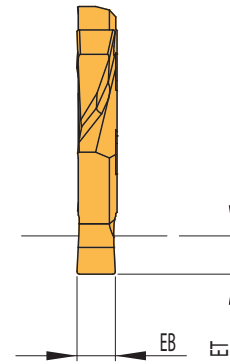
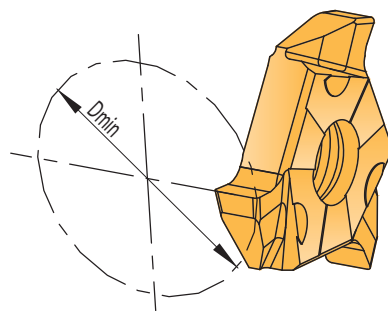
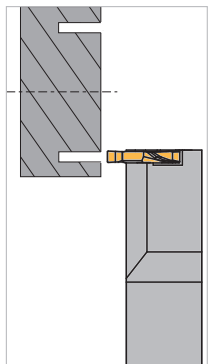
Einstecken / Grooving / Scanalatura

	Schneideinsatz / Insert / Insetto	
	TNMU 17	TNMU 31
f_v	0,2–0,12	0,02–0,15
f_n	0,02–0,12	0,02–0,15
f_k	①	①

Hinweis: Bei rechten und linken Schneidplatten Vorschub um 30 – 50% reduzieren.
Remark: When using right or left-hand inserts, reduce feed by 30 – 50%.
Nota: Per gli inserti a destra e a sinistra, ridurre l'avanzamento dal 30 al 50%.

① Kopieren nicht möglich!
Copying not possible!
Copiatura non possibile!

Clip-Groove® axial / Clip-Groove® axial / Clip-Groove® assiale



Clip-Groove® axial – speziell für Formeinstiche bei der Axialbearbeitung.

Clip-Groove® axial especially for face grooving.

Clip-Groove® assiale – specifico per lavorazioni a tuffo assiali.

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