

# *Bohrer / Fräser*

## *Micro*

*Drills / Mills Micro*

*Forets / fraises micro*



+7 812 335 59 35  
info@sunttools.ru



[www.dieterle-tools.com](http://www.dieterle-tools.com)





Sehr geehrter Kunde,

Unser Spezialwissen im technischen Bereich der Drehteilefertigung ermöglicht es uns, Problemlösungen im Werkzeugbereich zu schaffen, welche außerhalb des üblichen Standards liegen. Wir sind überzeugt, dass vor allem die qualitative Leistung den Erfolg und die Stabilität eines Unternehmens im Wesentlichen beeinflusst.

Deshalb sehen wir unsere Aufgabe in der ständigen Neuorientierung der qualitativen und produktiven Anforderungen, mit welchen sich unsere Kunden auseinandersetzen müssen. Die Zielsetzung unserer Firma ist es, die Kunden durch die optimale Lösung ihrer fertigungstechnischen Probleme zum Erfolg zu verhelfen.

Dear user,

Our special knowledge in the technically advanced field of producing turned parts enables us to produce tooling solutions which are beyond typical standards. We are convinced that quality is the most important factor for the future prospects of every company in that market. This is why we are always searching for new solutions to solve new problems of our customers. It is our aim to help our customers succeed in their market through supplying best solutions for their manufacturing problems.

Cher utilisateur,

Nos spéciales expériences dans le domaine technique de la fabrication des pièces tournées nous permet de fournir des solutions aux problèmes dans le domaine de l'outil, qui se trouvent en dehors des normes habituelles. Nous pensons que, en particulier la performance qualitative affecte le succès et la stabilité d'une société essentiellement, et nous voyons notre tâche dans la réorientation continue des besoins qualitatifs et productifs dont nos clients ont besoin. L'objectif de notre société est d'aider les clients à trouver la solution optimale de ses problèmes techniques.

### Stand/Version 03.2016

Die Angaben in diesem Katalog und der dazugehörigen Preisliste entsprechen dem Stand zu Druckbeginn.

Eventuelle Änderungen oder Druckfehler berechtigen nicht zu Ansprüchen.

Mit Erscheinen dieses Kataloges werden alle entsprechenden vorherigen Kataloge ungültig.

Nachdruck von Text und Bildern, auch auszugsweise, ist ohne unsere Genehmigung nicht gestattet.

All details in this catalogue and the corresponding price list are in accordance with our current standards at the time of printing. Any modifications, changes or misprints do not entitle to damages or claims.

With the publication of this catalogue any other existing catalogue is void.

No text, photograph and drawing, even in the form of extracts, may be reprinted without our permission.

Les indications de ce catalogue correspondent à la situation actuelle. Les modifications intervenues ou éventuelles erreurs d'impression n'ouvrent pas droit à des prétentions quelque'elles soient.

Toutes les autres catalogues sont rendues caduques par la parution de celui-ci.

La reproduction de textes et d'images, même partielle, est interdite sans notre autorisation.



ZERTIFIKAT  
**EQ**  
ZERT  
ISO 9001:2008

## ANWENDUNGSBEREICH

Auf jeder der Produktseiten finden Sie unseren Zerspanungskompass, der Auskunft darüber gibt, für welche Materialien diese spezielle Produktreihe geeignet ist.

## APPLICATION

Each product page contains our machining guide providing you with information on the materials for which this special product range is suitable.

## UTILISATION

Chaque page produit reprend notre guide d'usinage; celui-ci vous donne des indications sur les matériels adaptés à une gamme de produits spécifiques

## SYMBOLE ICONS SIGNIFICATION DES SYMBOLES

Zähnezahl  
No. of teeth  
Nombre de dents



Mögliche Bearbeitungsrichtung  
Possible machining direction  
Sense d'usinage possible



Beschichtung  
Coating  
Revêtement



Toleranz  
Tolerance  
Tolérance



Schneidrichtung  
Cutting direction  
Direction de coupe



mit polierter Schneide  
with polished flute  
avec coupe polie



Hochgeschwindigkeitszerspanen  
High speed cutting  
Haute vitesse de coupeure



Schnittdatenempfehlungen  
Cutting data recommendation  
Recommandations des données de coupe



Werkzeuge mit höchster Genauigkeit im  $\mu$ -Bereich  
Tools with optimum accuracy within the  $\mu$ -range  
Outils avec une précision maximale dans le domaine de micron



## bohren / drilling / perçage

### System/Systeme B20

Seiten /Pages: 18-22

#### VHM-Spiralbohrer

2 Schneiden  
rechtsschneidend

#### SC twist drills

2 flutes  
right-hand cutting

#### Foret hélicoïdal en carbure

2 dents  
coupe à droite



### System D6981

Seiten /Pages: 23-27

#### VHM-Mikro-Spiralbohrer, kurz, mit verstärktem Schaft (1,0/1,5)

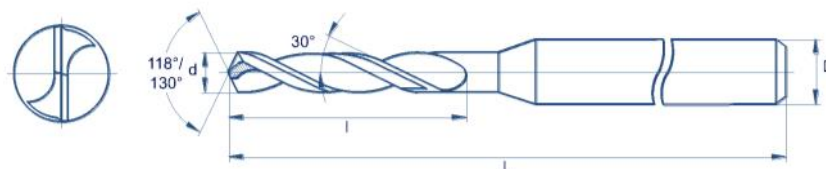
2 Schneiden  
rechtsschneidend

#### SC micro twist drill, short, with reinforced shank (1,0/1,5)

2 flutes  
right-hand cutting

#### Micro foret hélicoïdal, court, en carbure avec manche renforcée (1,0/1,5)

2 dents  
coupe à droite



### System D6961

Seiten /Pages: 28-31

#### VHM-Mikro-Spiralbohrer, kurz, mit verstärktem Schaft 3,0 mm

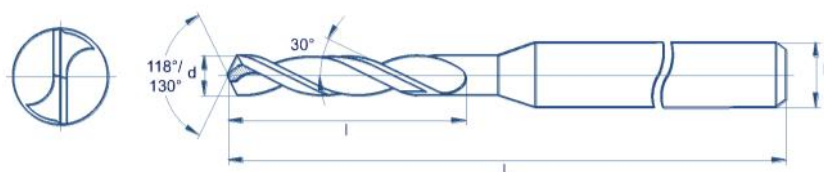
2 Schneiden  
rechtsschneidend

#### SC micro twist drill, short, with reinforced shank 3,0 mm

2 flutes  
right-hand cutting

#### Micro-foret hélicoïdal, court, en carbure avec manche renforcée 3,0 mm

2 dents  
coupe à droite



## bohren / drilling / perçage

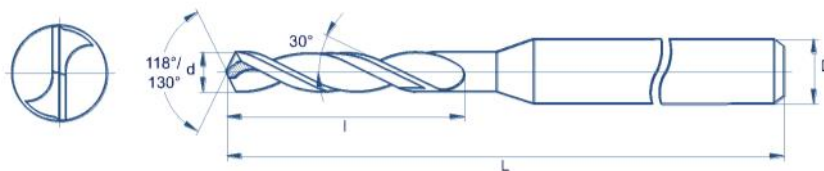
### System/Systeme D6961F

Seiten /Pages: 32-34

**VHM-Mikro-Spiralbohrer,**  
kurz, mit verstärktem Schaft  
**3,0 mm**  
**TiAlN beschichtet**  
2 Schneiden  
rechtsschneidend

**SC micro twist drills, short,**  
with reinforced shank  
**3,0 mm**  
**TiAlN coated**  
2 flutes  
right-hand cutting

**Micro-foret hélicoïdal, court,**  
en carbure avec manche ren-  
forcée **3,0 mm**  
**Revêtement: TiAlN**  
2 dents  
coupe à droite



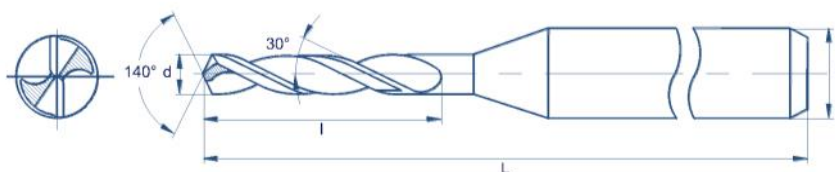
### System/Systeme D2101

Seiten /Pages: 35

**VHM-Spiralbohrer mit**  
**verstärktem Schaft 6,0 mm**  
unbeschichtet  
2 Schneiden  
rechtsschneidend

**SC twist drills with**  
**reinforced shank 6,0 mm**  
uncoated  
2 flutes  
right-hand cutting

**Foret hélicoïdal en carbure avec**  
**manche renforcée 6,0 mm**  
non revêtue  
2 dents  
coupe à droite



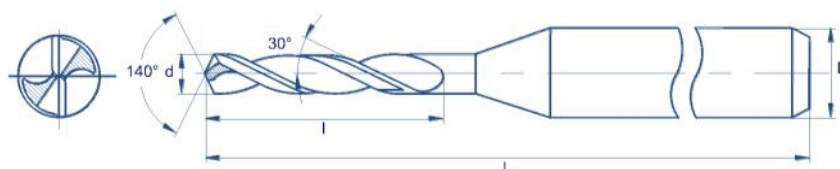
### System/Systeme D2101N

Seiten /Pages: 36

**VHM-Spiralbohrer mit**  
**verstärktem Schaft 6,0 mm**  
nACo-beschichtet  
2 Schneiden  
rechtsschneidend

**SC twist drills with**  
**reinforced shank 6,0 mm**  
nACo coated  
2 flutes  
right-hand cutting

**Foret hélicoïdal en carbure avec**  
**manche renforcée 6,0 mm**  
revêtement: nACo  
2 dents  
coupe à droite



## bohren / drilling / perçage

### System/Systeme D2101C

Seiten /Pages: 37

**VHM-Spiralbohrer mit  
verstärktem Schaft 6,0 mm**

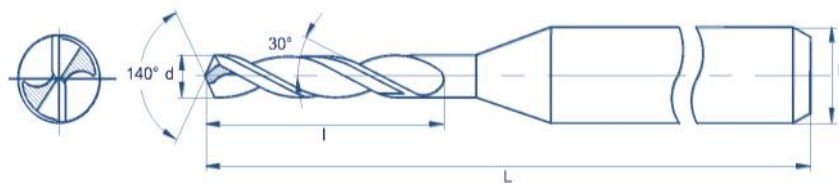
DLC-beschichtet  
2 Schneiden  
rechtsschneidend

**SC twist drills with  
reinforced shank 6,0 mm**

DLC coated  
2 flutes  
right-hand cutting

**Foret hélicoïdal en carbure avec  
manche renforcée 6,0 mm**

revêtement: DLC  
2 dents  
coupe à droite



## HPC-bohren / HPC drilling / HPC perçage

### System/Systeme D6941F

Seiten /Pages: 38-39

**VHM-Mikro-  
Hochleistungsbohrer HPC**

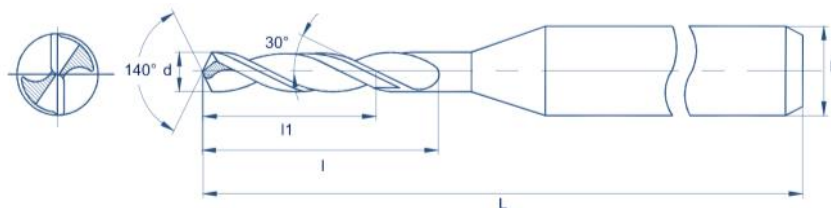
STEEL 5xD  
**TiAlN beschichtet**  
2 Schneiden  
rechtsschneidend

**SC high performance micro  
drills HPC**

STEEL 5xD  
**TiAlN coated**  
2 flutes  
right-hand cutting

**Micro foret en carbure haute per-  
formance HPC**

STEEL 5xD  
**Revêtement: TiAlN**  
2 dents  
coupe à droite



## HPC-bohren / HPC drilling / HPC perçage

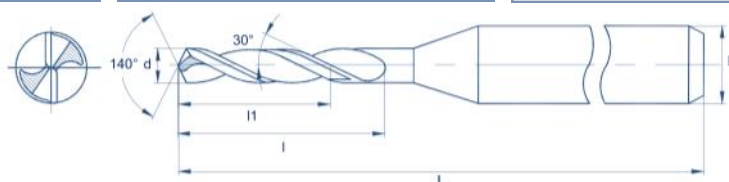
### System/Système D2131F

Seiten /Pages: 40

**VHM-Mikro-Hochleistungsbohrer HPC**  
**INOX 5xD**  
**TiAlN beschichtet**  
 2 Schneiden  
 rechtsschneidend

**SC**  
**high performance micro drills HPC**  
**INOX 5xD**  
**TiAlN coated**  
 2 flutes  
 right-hand cutting

**Micro foret haute performance**  
**HPC en carbure**  
**INOX 5xD**  
**Revêtement: TiAlN**  
 2 dents  
 coupe à droite



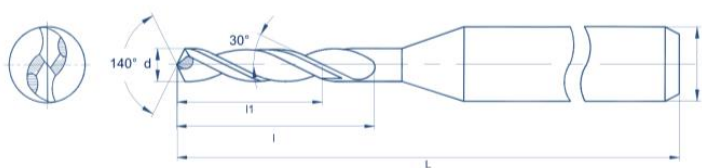
### System/Système D6401

Seiten /Pages: 41

**VHM-Mikro-Hochleistungsbohrer HPC**  
**ALU 5xD**  
**mit polierter Schneide**  
 2 Schneiden  
 rechtsschneidend

**SC high performance micro drill HPC**  
**ALU 5xD**  
**with polished flutes**  
 2 flutes  
 right-hand cutting

**Micro foret haute performance**  
**HPC en carbure**  
**ALU 5xD**  
**avec coupes polies**  
 2 dents  
 coupe à droite



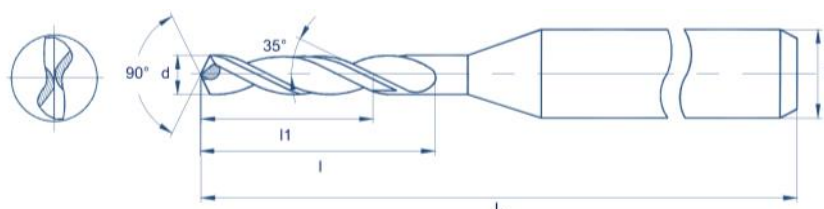
### System/Système D6601D

Seiten /Pages: 42

**VHM-Mikro-Hochleistungsbohrer HPC**  
**CFRP 5xD**  
**Diamant beschichtet**  
 2 Schneiden  
 rechtsschneidend

**SC high performance micro drills HPC**  
**CFRP 5xD**  
**Diamond coated**  
 2 flutes  
 right-hand cutting

**Micro foret haute performance**  
**HPC en carbure**  
**PRFC/PRFV 5xD**  
**Revêtement: diamant**  
 2 dents  
 coupe à droite



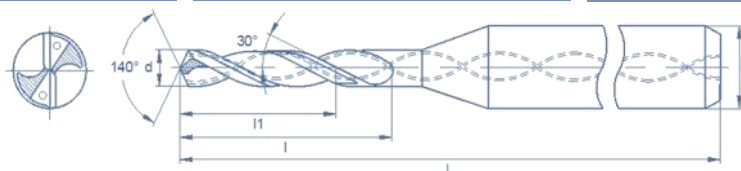
## HPC-bohren / HPC drilling / HPC perçage

### System/Système DIK2131F 8xD Seiten /Pages: 43

**VHM Micro-Hochleistungsbohrer mit innerer Kühlmittelzufuhr**  
**TiAlN beschichtet**  
 2 Schneiden  
 rechtschneidend  
 Drallwinkel: 30°  
 Spitzenwinkel: 140°  
 Anschnitt: 4 Flächen

**SC micro drills HPC with internal coolant**  
**TiAlN coated**  
 2 flutes  
 right-hand cutting  
 Helix angle: 30°  
 Point angle: 140°  
 Chamfer: 4 facet pointing

**Micro-foret hélicoïdal HPC en carbure à arrosage central**  
**Revêtement: TiAlN**  
 2 dents  
 coupe à droite  
 Angle d'hélice: 30°  
 Angle de pointe: 140°  
 Affûtage: 4 facettes

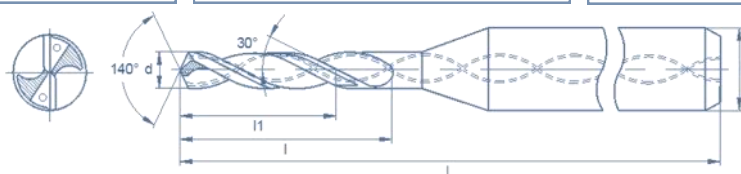


### System/Système DIK2131F 12xD Seiten /Pages: 44

**VHM Micro-Hochleistungsbohrer mit innerer Kühlmittelzufuhr**  
**TiAlN beschichtet**  
 2 Schneiden  
 rechtschneidend  
 Drallwinkel: 30°  
 Spitzenwinkel: 140°  
 Anschnitt: 4 Flächen

**SC micro drills HPC with internal coolant**  
**TiAlN coated**  
 2 flutes  
 right-hand cutting  
 Helix angle: 30°  
 Point angle: 140°  
 Chamfer: 4 facet pointing

**Micro-foret hélicoïdal HPC en carbure à arrosage central**  
**Revêtement: TiAlN**  
 2 dents  
 coupe à droite  
 Angle d'hélice: 30°  
 Angle de pointe: 140°  
 Affûtage: 4 facettes

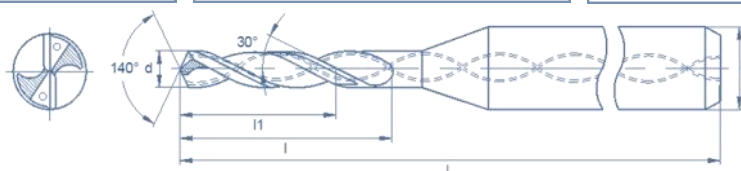


### System/Système DIK2131F 15xD Seiten /Pages: 45

**VHM Micro-Hochleistungsbohrer mit innerer Kühlmittelzufuhr**  
**TiAlN beschichtet**  
 2 Schneiden  
 rechtschneidend  
 Drallwinkel: 30°  
 Spitzenwinkel: 140°  
 Anschnitt: 4 Flächen

**SC micro drills HPC with internal coolant**  
**TiAlN coated**  
 2 flutes  
 right-hand cutting  
 Helix angle: 30°  
 Point angle: 140°  
 Chamfer: 4 facet pointing

**Micro-foret hélicoïdal HPC en carbure à arrosage central**  
**Revêtement: TiAlN**  
 2 dents  
 coupe à droite  
 Angle d'hélice: 30°  
 Angle de pointe: 140°  
 Affûtage: 4 facettes



## zentrieren / centring / centrage

### System/Système D5701

Seiten /Pages: 46

#### VHM-Zentrierbohrer nach DIN 333

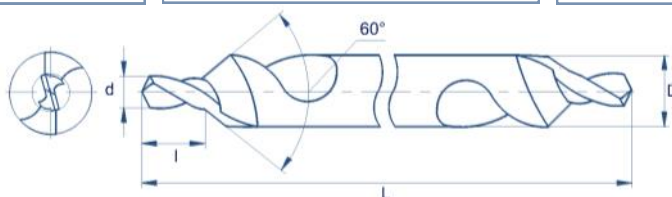
2 Schneiden  
rechtsschneidend  
Form A

#### SC centre drills acc. to DIN 333

2 flutes  
right-hand cutting  
profile A

#### Foret à centrer en carbure dimen- sions selon DIN 333

2 dents  
coupe à droite  
forme A



### System/Système D4911

Seiten /Pages: 47

#### VHM-NC-Anbohrer

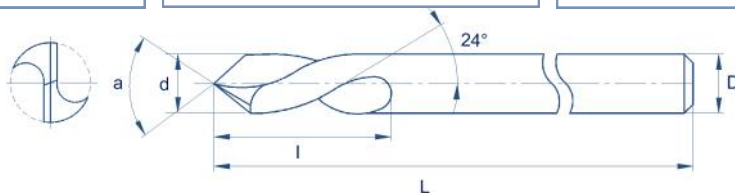
2 Schneiden  
rechtsschneidend  
Spitzenwinkel: 90°

#### SC NC spotting drills

2 flutes  
right-hand cutting  
Point angle: 90°

#### Foret à pointer en carbure

2 dents  
coupe à droite  
Angle de pointe: 90°



### System/Système D4921

Seiten /Pages: 48

#### VHM-NC-Anbohrer

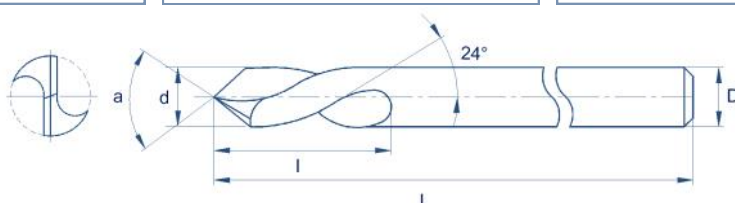
2 Schneiden  
rechtsschneidend  
Spitzenwinkel: 120°

#### SC NC spotting drills

2 flutes  
right-hand cutting  
Point angle: 120°

#### Foret à pointer en carbure

2 dents  
coupe à droite  
Angle de pointe: 120°



## fräsen / milling / fraisage

### System/Système M8231

Seiten /Pages: 49

#### VHM-

#### Einschneidenfräser (RH/RC)

#### mit polierter Schneide

1 Schneide

rechtsschneidend, ziehend  
Für Aluminium, weiche NE-  
Metalle und Kunststoffe

#### Solid carbide

#### single flute end mill (RH/RC)

#### with polished flute

1 flute

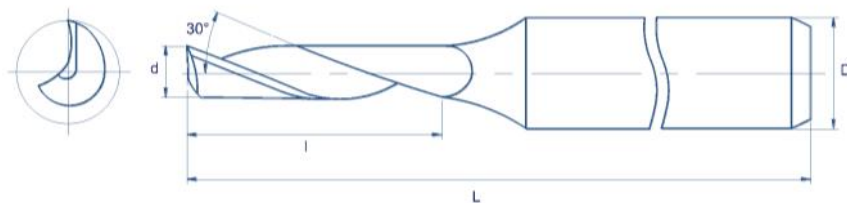
right-hand cutting, up-cut  
For aluminium, soft non-  
ferrous materials and plastics

#### Fraise à une lèvre en carbure (RH/RC)

#### avec coupe polie

1 dent

coupe à droite, cisailage  
oblique  
Pour aluminium, matériaux non-  
ferreux et plastiques



### System/Système M8211

Seiten /Pages: 50-51

#### VHM-

#### Einschneidenfräser (LH/RC)

#### mit polierter Schneide

1 Schneide

rechtsschneidend, schiebend  
Für Aluminium, weiche NE-  
Metalle und Kunststoffe

#### Solid carbide

#### single flute end mill (LH/RC)

#### with polished flute

1 flute

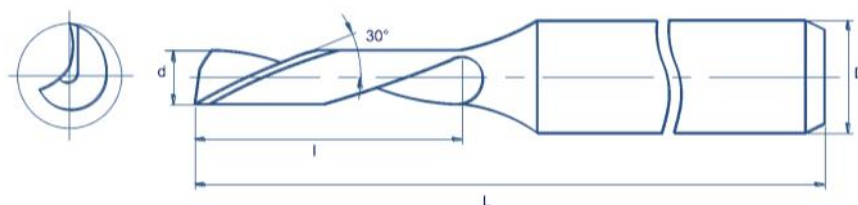
right-hand cutting, down-cut  
For aluminium, soft non-  
ferrous materials and plastics

#### Fraise à une lèvre en carbure (LH/RC)

#### avec coupe polie

1 dent

coupe à droite, par coulissement  
Pour aluminium, matériaux non-  
ferreux et plastiques



## fräsen / milling / fraisage

### System/Système M9661

Seiten /Pages: 52-53

#### VHM-

#### Mikro-Schaftfräser (RH/RC)

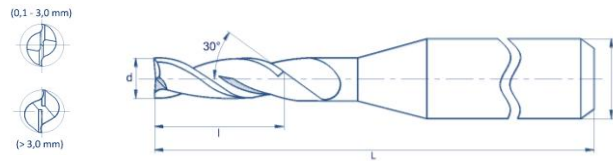
2 Schneiden  
rechtsschneidend, ziehend

#### Solid carbide micro end mill (RH/RC)

2 flutes  
right-hand cutting, up-cut

#### Mini fraise à queue en carbure (RH/RC)

2 dents  
coupe à droite, par cisailage oblique



### System/Système M9661F

Seiten /Pages: 54-55

#### VHM-

#### Mikro-Schaftfräser (RH/RC) TiAlN beschichtet für HSC Bearbeitung

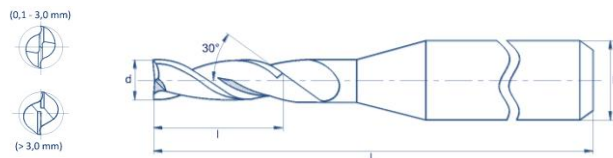
2 Schneiden  
rechtsschneidend, ziehend

#### Solid carbide micro end mill (RH/RC) TiAlN coated for HSC machining

2 flutes  
right-hand cutting, up-cut

#### Mini fraise à queue en carbure

(RH/RC)  
Revêtement: TiAlN  
pour l'usage HSC  
2 dents  
coupe à droite, par cisailage oblique



### System/Système M8381

Seiten /Pages: 56

#### VHM-Schaftfräser für den HPC-Einsatz (RH/RC)

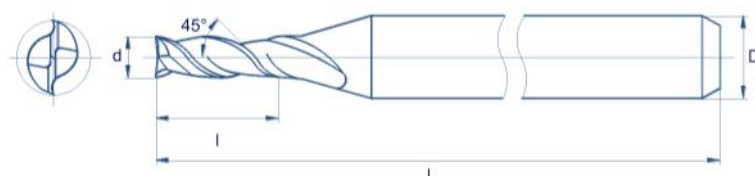
2 Schneiden  
rechtsschneidend, ziehend  
Für Aluminium, weiche NE-  
Metalle und Kunststoffe

#### Solid carbide end mill for HPC milling (RH/RC)

2 flutes  
right-hand cutting, up-cut  
For aluminium, soft non-  
ferrous materials and plastics

#### Fraise à queue en carbure pour l'usage HPC (RH/RC)

2 dents  
coupe à droite, par cisailage oblique  
Pour aluminium, matériaux non-  
ferreux et plastiques



## fräsen / milling / fraisage

### System/Système M8381N

Seiten /Pages: 57

#### VHM-Schaftfräser für den HPC-Einsatz (RH/RC)

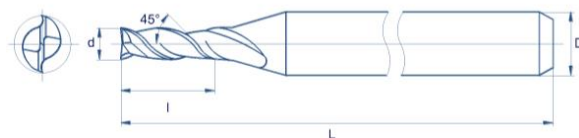
2 Schneiden  
rechtsschneidend, ziehend  
Für Aluminium, weiche NE-Metalle und Kunststoffe  
nACRo beschichtet

#### Solid carbide end mill for HPC milling (RH/RC)

2 flutes  
right-hand cutting, up-cut  
For aluminium, soft non-ferrous materials and plastics  
nACRo coated

#### Fraise à queue en carbure pour l'usinage HPC (RH/RC)

2 dents  
coupe à droite, par cisailage oblique  
Pour aluminium, matériaux non-ferreux et plastiques  
Revêtement: nACRo



### System/Système M9681

Seiten /Pages: 58

#### VHM-Mikro-Schaftfräser (RH/RC)

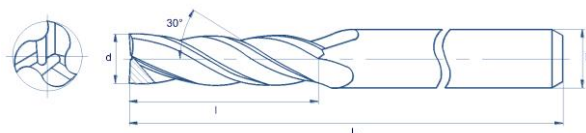
3 Schneiden  
rechtsschneidend, ziehend

#### Solid carbide micro end mill (RH/RC)

3 flutes  
right-hand cutting, up-cut

#### Mini fraise en carbure (RH/RC)

3 dents  
coupe à droite, par cisailage oblique



### System/Système M9681F

Seiten /Pages: 59

#### VHM-Mikro-Schaftfräser (RH/RC)

**TiAlN beschichtet**  
3 Schneiden  
rechtsschneidend, ziehend  
Für Stahl, Guss und Messing

#### Solid carbide micro end mill (RH/RC)

**TiAlN coated**  
3 flutes  
right-hand cutting, up-cut  
For steel, cast iron and brass

#### Mini fraise en carbure (RH/RC)

**Revêtement: TiAlN**  
3 dents  
coupe à droite, par cisailage oblique  
Pour acier, fonte et laiton



## fräsen / milling / fraisage

### System/Système M9671

Seiten /Pages: 60

**VHM-**

**Mikro-Schaftfräser  
mit Zentrumsschnitt  
(RH/RC)**

4 Schneiden  
rechtsschneidend, ziehend

**Solid carbide  
micro end mill  
with centre cut (RH/RC)**

4 flutes  
right-hand cutting, up-cut

**Mini fraise en carbure  
avec coupe au centre  
(RH/RC)**

4 dents  
coupe à droite, par cisailage oblique



### System/Système M9671F

Seiten /Pages: 61

**VHM-**

**Mikro-Schaftfräser  
mit Zentrumsschnitt  
(RH/RC)**

**TiAlN beschichtet**

4 Schneiden  
rechtsschneidend, ziehend  
Für Stahl, Guss und Cu(Zn)-  
Legierungen

**Solid carbide  
micro end mill  
with centre cut (RH/RC)**

**TiAlN coated**

4 flutes  
right-hand cutting, up-cut  
For steel, cast iron  
and Cu(Zn) alloys

**Mini fraise en carbure  
avec coupe au centre  
(RH/RC)**

**Revêtement: TiAlN**

4 dents  
coupe à droite, par cisailage oblique  
Pour acier, fonte et  
alliages Cu(Zn)



## fräsen / milling / fraisage

### System/Système M9701

Seiten /Pages: 62-63

#### VHM-

#### Mikro-Radiusfräser mit Zentrumsschnitt (RH/RC)

2 Schneiden  
rechtsschneidend, ziehend

#### Formgenauigkeit:

Radius  $\pm 0,005$  (R0,1-R1,5)  
Radius  $\pm 0,010$  (R2,0-R6,0)

#### Solid carbide

#### micro ball nose end mill with centre cut (RH/RC)

2 flutes  
right-hand cutting, up-cut

#### Accuracy of shape:

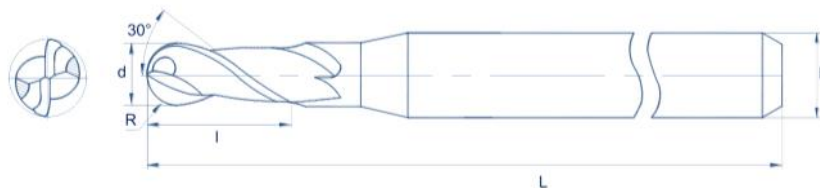
radius  $\pm 0,005$  (R0,1-R1,5)  
radius  $\pm 0,010$  (R2,0-R6,0)

#### Mini fraise hémisphérique en car- bure avec coupe au centre (RH/RC)

2 dents  
coupe à droite, par cisailage oblique

#### Précision de forme:

rayon  $\pm 0,005$  (R0,1-R1,5)  
rayon  $\pm 0,010$  (R2,0-R6,0)



### System/Système M9701F

Seiten /Pages: 64-65

#### VHM-

#### Mikro-Radiusfräser mit Zentrumsschnitt (RH/RC)

#### TiAlN beschichtet

2 Schneiden  
rechtsschneidend, ziehend

#### Formgenauigkeit:

Radius  $\pm 0,005$  (R0,1-R1,5)  
Radius  $\pm 0,010$  (R2,0-R6,0)

#### Solid carbide

#### micro ball nose end mill with centre cut (RH/RC)

#### TiAlN coated

2 flutes  
right-hand cutting, up-cut

#### Accuracy of shape:

radius  $\pm 0,005$  (R0,1-R1,5)  
radius  $\pm 0,010$  (R2,0-R6,0)

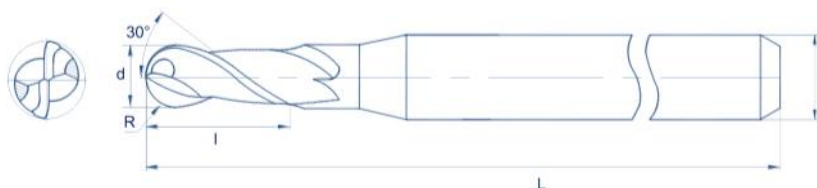
#### Mini fraise hémisphérique en car- bure avec coupe au centre (RH/ RC)

#### Revêtement: TiAlN

2 dents  
coupe à droite, par cisailage obli-  
que

#### Précision de forme:

rayon  $\pm 0,005$  (R0,1-R1,5)  
rayon  $\pm 0,010$  (R2,0-R6,0)



## Fräsen(CFK/GFK) / milling(CFRP) / fraisage(PRFC/PRFV)

### System/Système M6401

Seiten /Pages: 66

#### VHM-

**Router CFK/GFK  
(RH/RC)**

#### Verzahnung –fein-

Hochleistungs-  
Kreuzverzahnung  
rechtsschneidend, ziehend

Speziell für abrasive  
Materialien und  
faserverstärkte Kunststoffe

**Solid carbide  
router CFRP  
(RH/RC)**

#### Cut type -fine-

High performance criss-cross  
cutting  
right-hand cutting, up-cut

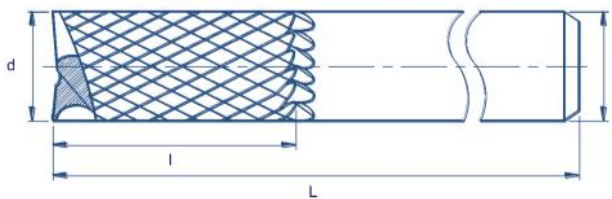
Especially for the machining  
of abrasive materials and fibre  
-reinforced plastics

**Fraise en carbure  
PRFC/PRFV  
(RH/RC)**

#### Type de coupe -fine-

Denture croisée haute  
performance

Pour l'usinage de matériaux abrasifs  
et de plastiques  
renforcés de fibres



### System/Système M6391

Seiten /Pages: 67

#### VHM-

**Router CFK/GFK  
(RH/RC)**

#### Verzahnung –mittel-

Hochleistungs-  
Kreuzverzahnung  
rechtsschneidend, ziehend

Speziell für abrasive  
Materialien und  
faserverstärkte Kunststoffe

**Solid carbide  
router CFRP  
(RH/RC)**

#### Cut type –medium-

High performance criss-cross  
cutting  
right-hand cutting, up-cut

Especially for machining abra-  
sive materials and fibre-  
reinforced composites

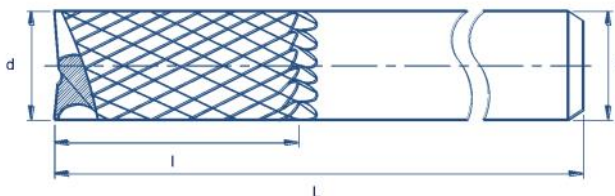
**Fraise en carbure  
PRFC/PRFV  
(RH/RC)**

#### Type de coupe –moyenne-

Denture croisée haute  
performance

Coupe à droite, par cisailage obli-  
que

Pour l'usinage de matériaux abra-  
sifs et de plastiques



## Fräsen(CFK/GFK) / milling(CFRP) / fraisage(PRFC/PRFV)

### System/Système M6381

Seiten /Pages: 68

#### VHM-

#### Router CFK/GFK (RH/RC)

#### Verzahnung –grob-

Hochleistungs-  
Kreuzverzahnung  
rechtsschneidend, ziehend

Speziell für abrasive  
Materialien und  
faserverstärkte Kunststoffe

#### Solid carbide router CFRP (RH/RC)

#### Cut type –coarse-

High performance criss-cross  
cutting  
right-hand cutting, up-cut

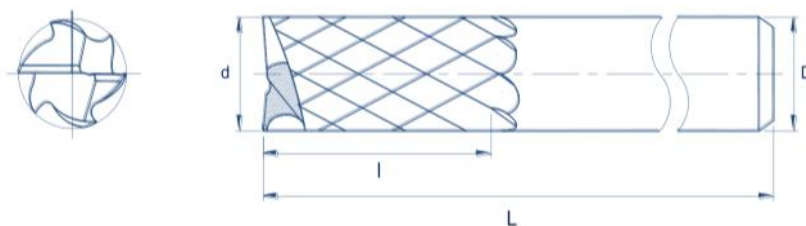
Especially for machining abra-  
sive materials and fibre-  
reinforced plastics

#### Fraise en carbure PRFC/PRFV (RH/RC)

#### Type denture - grossière-

Denture croisée haute  
performance

Spécialement pour l'usinage de  
matériaux abrasifs et de plastiques  
renforcés de fibres



## VHM-Reibahlen/Solid carbide reamers/Alésoirs en carbure

### System /Système R00

Seiten /Pages: 69-70

#### VHM-

#### Reibahlen mit Zylinderschaft

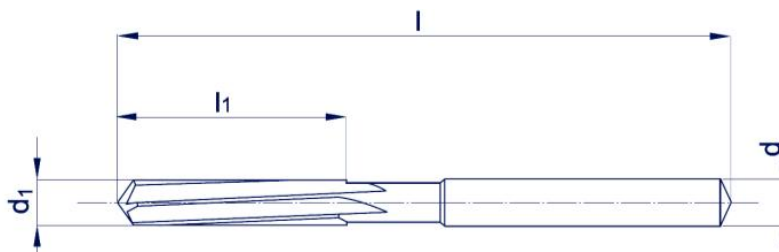
Baumaße nach DIN 212  
Schnitttrichtung: rechts mit  
Linksdrall (LH/RC).  
Alle Abmessungen ab Lager  
oder kurzfristig lieferbar

#### Solid carbide reamers with cylindrical shank

Dimensions as per DIN 212  
Cutting direction: RH with left-  
hand helix angle (LH/RC).  
All dimensions available from  
stock or at short notice

#### Alésoirs en carbure avec queue cylindrique

Dimensions selon DIN 212  
Exécution:  
coupe à droite et hélice à gauche  
(LH/RC).  
Toutes dimensions en stock, ou  
livrable rapidement



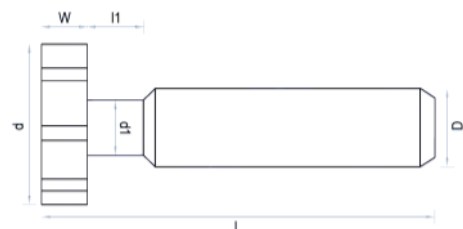
VHM T-Nut Fräser

Solid carbide T-Slot cutter

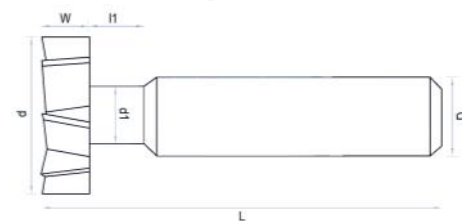
Fraise en carbure pour rainure en T

Seiten /Pages: 71-74

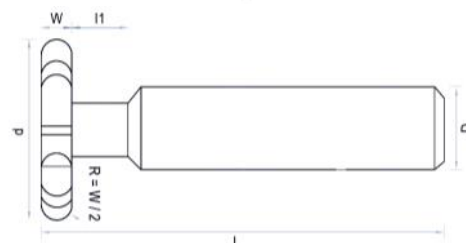
**System/Systeme M4011**  
**Art.Nr. 158175**



**System/Systeme M4021**  
**Art.Nr. 158176**



**System/Systeme M4031**  
**Art.Nr. 158177**



Seiten /Pages: 75-81



**Technische Angaben**  
**Technical Details**  
**Données techniques**



## System/Système B20

|                           |                           |                                 |                                 |                               |                               |                             |                            |                             |                              |                      |
|---------------------------|---------------------------|---------------------------------|---------------------------------|-------------------------------|-------------------------------|-----------------------------|----------------------------|-----------------------------|------------------------------|----------------------|
| <b>ALU</b><br><10%Si<br>● | <b>ALU</b><br>>10%Si<br>● | <b>STEEL</b><br><1000N/mm²<br>● | <b>STEEL</b><br>>1000N/mm²<br>● | <b>INOX</b><br><850N/mm²<br>● | <b>INOX</b><br>>850N/mm²<br>● | <b>Ti</b><br>>850N/mm²<br>● | <b>CAST</b><br>GGG/GG<br>● | <b>Cu(Zn)</b><br>Au/Ag<br>● | <b>CFRP</b><br>Graphite<br>● | <b>Plastics</b><br>● |
|---------------------------|---------------------------|---------------------------------|---------------------------------|-------------------------------|-------------------------------|-----------------------------|----------------------------|-----------------------------|------------------------------|----------------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

### VHM-Spiralbohrer

2 Schneiden  
rechtsschneidend

Drallwinkel: 30°  
Spitzenwinkel: 118°

4 Flächen-Anschnitt

Verpackungseinheit: 5 Stück

### SC twist drills

2 flutes  
right-hand cutting

Helix angle: 30°  
Point angle: 118°

4 surface grinding

Packing unit: 5 pieces

### Foret hélicoïdal en carbure

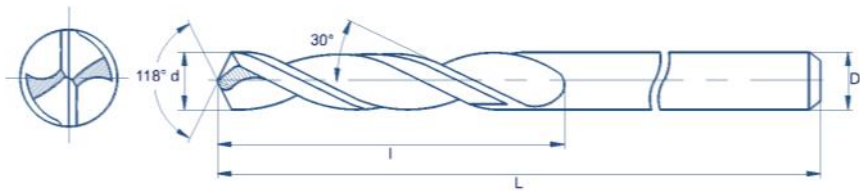
2 dents  
coupe à droite

Angle d'hélice: 30°  
Angle de pointe: 118°

Affûtage sur 4 surfaces

Unité d'emballage par 5

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref.<br>Réf. | Ø d<br>h6<br>in<br>mm | l<br>in mm | L<br>in mm | ØD h6<br>in mm |  |
|------------------------------------|---------------------------|-----------------------|------------|------------|----------------|--|
| 139771                             | B20.0050                  | 0,50                  | 5          | 22         | 0,50           |  |
| 154858                             | B20.0055                  | 0,55                  | 5          | 22         | 0,55           |  |
| 137550                             | B20.0060                  | 0,60                  | 5          | 22         | 0,60           |  |
| 154867                             | B20.0065                  | 0,65                  | 6          | 22         | 0,65           |  |
| 154868                             | B20.0070                  | 0,70                  | 6          | 22         | 0,70           |  |
| 154869                             | B20.0075                  | 0,75                  | 6          | 24         | 0,75           |  |
| 154870                             | B20.0080                  | 0,80                  | 6          | 24         | 0,80           |  |
| 154871                             | B20.0085                  | 0,85                  | 7          | 24         | 0,85           |  |
| 154872                             | B20.0090                  | 0,90                  | 7          | 24         | 0,90           |  |
| 154873                             | B20.0095                  | 0,95                  | 7          | 26         | 0,95           |  |
| 132546                             | B20.0100                  | 1,00                  | 7          | 26         | 1,00           |  |
| 150477                             | B20.0110                  | 1,10                  | 8          | 28         | 1,10           |  |
| 154876                             | B20.0115                  | 1,15                  | 9          | 30         | 1,15           |  |
| 135357                             | B20.0120                  | 1,20                  | 9          | 30         | 1,20           |  |
| 150974                             | B20.0125                  | 1,25                  | 9          | 30         | 1,25           |  |
| 154877                             | B20.0130                  | 1,30                  | 9          | 30         | 1,30           |  |
| 154879                             | B20.0135                  | 1,35                  | 10         | 32         | 1,35           |  |
| 138214                             | B20.0140                  | 1,40                  | 10         | 30         | 1,40           |  |
| 147642                             | B20.0145                  | 1,45                  | 10         | 30         | 1,45           |  |
| 154880                             | B20.0150                  | 1,50                  | 10         | 30         | 1,50           |  |
| 135089                             | B20.0155                  | 1,55                  | 11         | 34         | 1,55           |  |
| 135355                             | B20.0160                  | 1,60                  | 11         | 34         | 1,60           |  |
| 135601                             | B20.0165                  | 1,65                  | 11         | 34         | 1,65           |  |
| 131061                             | B20.0170                  | 1,70                  | 11         | 34         | 1,70           |  |
| 154881                             | B20.0175                  | 1,75                  | 12         | 36         | 1,75           |  |
| 154882                             | B20.0180                  | 1,80                  | 12         | 36         | 1,80           |  |
| 135272                             | B20.0185                  | 1,85                  | 12         | 36         | 1,85           |  |
| 154883                             | B20.0190                  | 1,90                  | 12         | 36         | 1,90           |  |
| 154884                             | B20.0195                  | 1,95                  | 13         | 38         | 1,95           |  |



## System/Système B20

|                          |                          |                                |                                |                              |                              |                            |                           |                            |                             |                     |
|--------------------------|--------------------------|--------------------------------|--------------------------------|------------------------------|------------------------------|----------------------------|---------------------------|----------------------------|-----------------------------|---------------------|
| <b>ALU</b><br><10%Si<br> | <b>ALU</b><br>>10%Si<br> | <b>STEEL</b><br><1000N/mm²<br> | <b>STEEL</b><br>>1000N/mm²<br> | <b>INOX</b><br><850N/mm²<br> | <b>INOX</b><br>>850N/mm²<br> | <b>Ti</b><br>>850N/mm²<br> | <b>CAST</b><br>GGG/GG<br> | <b>Cu(Zn)</b><br>Au/Ag<br> | <b>CFRP</b><br>Graphite<br> | <b>Plastics</b><br> |
|--------------------------|--------------------------|--------------------------------|--------------------------------|------------------------------|------------------------------|----------------------------|---------------------------|----------------------------|-----------------------------|---------------------|

- optimal geeignet / first choice / premier choix

- geeignet / suitable / approprié

- nicht geeignet / suitable / pas approprié

### VHM-Spiralbohrer

2 Schneiden  
rechtsschneidend

Drallwinkel: 30°  
Spitzenwinkel: 118°

4-Flächen-Anschnitt

Verpackungseinheit: 5 Stück

### SC twist drills

2 flutes  
right-hand cutting

Helix angle: 30°  
Point angle: 118°

4-surface grinding

Packing unit: 5 pieces

### Foret hélicoïdal en carbure

2 dents  
coupe à droite

Angle d'hélice: 30°  
Angle de pointe: 118°

Affûtage sur 4 surfaces

Unité d'emballage par 5

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref.<br>Réf. | Ø d<br>h6<br>in<br>mm | L<br>in<br>mm | ØD h6<br>in<br>mm |
|------------------------------------|---------------------------|-----------------------|---------------|-------------------|
| 154885                             | B20.0200                  | 2,00                  | 13            | 38                |
| 154886                             | B20.0205                  | 2,05                  | 13            | 38                |
| 148955                             | B20.0210                  | 2,10                  | 13            | 38                |
| 134698                             | B20.0215                  | 2,15                  | 14            | 40                |
| 154887                             | B20.0220                  | 2,20                  | 14            | 40                |
| 154888                             | B20.0225                  | 2,25                  | 14            | 40                |
| 153427                             | B20.0230                  | 2,30                  | 14            | 40                |
| 154890                             | B20.0235                  | 2,35                  | 15            | 43                |
| 154891                             | B20.0240                  | 2,40                  | 15            | 43                |
| 154892                             | B20.0245                  | 2,45                  | 15            | 43                |
| 154893                             | B20.0250                  | 2,50                  | 15            | 43                |
| 147108                             | B20.0255                  | 2,55                  | 15            | 43                |
| 154894                             | B20.0260                  | 2,60                  | 15            | 43                |
| 135356                             | B20.0265                  | 2,65                  | 17            | 46                |
| 149199                             | B20.0270                  | 2,70                  | 17            | 46                |
| 145382                             | B20.0275                  | 2,75                  | 17            | 46                |
| 154895                             | B20.0280                  | 2,80                  | 17            | 46                |
| 154896                             | B20.0285                  | 2,85                  | 17            | 46                |
| 148954                             | B20.0290                  | 2,90                  | 17            | 46                |
| 138010                             | B20.0295                  | 2,95                  | 17            | 46                |
| 137955                             | B20.0300                  | 3,00                  | 17            | 46                |
| 141055                             | B20.0305                  | 3,05                  | 19            | 49                |
| 154898                             | B20.0310                  | 3,10                  | 19            | 49                |
| 154899                             | B20.0315                  | 3,15                  | 19            | 49                |
| 142667                             | B20.0320                  | 3,20                  | 19            | 49                |
| 154900                             | B20.0325                  | 3,25                  | 19            | 49                |
| 131062                             | B20.0330                  | 3,30                  | 19            | 49                |
| 154901                             | B20.0335                  | 3,35                  | 21            | 52                |
| 154902                             | B20.0340                  | 3,40                  | 21            | 52                |



## System/Système B20

|                          |                          |                                |                                |                              |                              |                            |                           |                            |                             |                     |
|--------------------------|--------------------------|--------------------------------|--------------------------------|------------------------------|------------------------------|----------------------------|---------------------------|----------------------------|-----------------------------|---------------------|
| <b>ALU</b><br><10%Si<br> | <b>ALU</b><br>>10%Si<br> | <b>STEEL</b><br><1000N/mm²<br> | <b>STEEL</b><br>>1000N/mm²<br> | <b>INOX</b><br><850N/mm²<br> | <b>INOX</b><br>>850N/mm²<br> | <b>Ti</b><br>>850N/mm²<br> | <b>CAST</b><br>GGG/GG<br> | <b>Cu(Zn)</b><br>Au/Ag<br> | <b>CFRP</b><br>Graphite<br> | <b>Plastics</b><br> |
|--------------------------|--------------------------|--------------------------------|--------------------------------|------------------------------|------------------------------|----------------------------|---------------------------|----------------------------|-----------------------------|---------------------|

- optimal geeignet / first choice / premier choix

- geeignet / suitable / approprié

- nicht geeignet / suitable / pas approprié

### VHM-Spiralbohrer

2 Schneiden  
rechtsschneidend

Drallwinkel: 30°  
Spitzenwinkel: 118°

4-Flächen-Anschnitt

Verpackungseinheit: 5 Stück

### SC twist drills

2 flutes  
right-hand cutting

Helix angle: 30°  
Point angle: 118°

4-surface grinding

Packing unit: 5 pieces

### Foret hélicoïdal en carbure

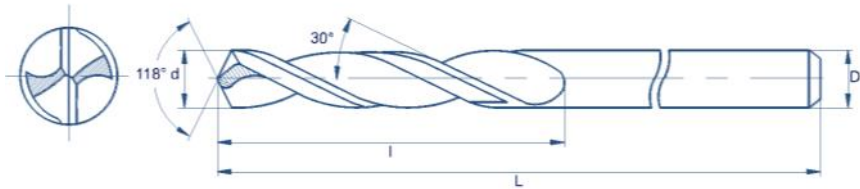
2 dents  
coupe à droite

Angle d'hélice: 30°  
Angle de pointe: 118°

Affûtage sur 4 surfaces

Unité d'emballage par 5

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref.<br>Réf. | Ø d<br>h6<br>in<br>mm | l<br>in mm | L<br>in mm | ØD h6<br>in mm |  |
|------------------------------------|---------------------------|-----------------------|------------|------------|----------------|--|
| 154903                             | B20.0345                  | 3,45                  | 21         | 52         | 3,45           |  |
| 154904                             | B20.0350                  | 3,50                  | 21         | 52         | 3,50           |  |
| 154905                             | B20.0355                  | 3,55                  | 21         | 52         | 3,55           |  |
| 135600                             | B20.0360                  | 3,60                  | 21         | 52         | 3,60           |  |
| 154908                             | B20.0365                  | 3,65                  | 21         | 52         | 3,65           |  |
| 131063                             | B20.0370                  | 3,70                  | 21         | 52         | 3,70           |  |
| 138354                             | B20.0375                  | 3,75                  | 23         | 55         | 3,75           |  |
| 154909                             | B20.0380                  | 3,80                  | 23         | 55         | 3,80           |  |
| 148952                             | B20.0385                  | 3,85                  | 23         | 55         | 3,85           |  |
| 154910                             | B20.0390                  | 3,90                  | 23         | 55         | 3,90           |  |
| 141056                             | B20.0395                  | 3,95                  | 23         | 55         | 3,95           |  |
| 134633                             | B20.0400                  | 4,00                  | 23         | 55         | 4,00           |  |
| 134634                             | B20.0405                  | 4,05                  | 23         | 55         | 4,05           |  |
| 154912                             | B20.0410                  | 4,10                  | 23         | 55         | 4,10           |  |
| 134697                             | B20.0415                  | 4,15                  | 23         | 55         | 4,15           |  |
| 154913                             | B20.0420                  | 4,20                  | 23         | 55         | 4,20           |  |
| 154914                             | B20.0425                  | 4,25                  | 25         | 58         | 4,25           |  |
| 154915                             | B20.0430                  | 4,30                  | 25         | 58         | 4,30           |  |
| 154916                             | B20.0435                  | 4,35                  | 25         | 58         | 4,35           |  |
| 134835                             | B20.0440                  | 4,40                  | 25         | 58         | 4,40           |  |
| 154917                             | B20.0445                  | 4,45                  | 25         | 58         | 4,45           |  |
| 154918                             | B20.0450                  | 4,50                  | 25         | 58         | 4,50           |  |
| 154919                             | B20.0455                  | 4,55                  | 25         | 58         | 4,55           |  |
| 148953                             | B20.0460                  | 4,60                  | 25         | 58         | 4,60           |  |
| 154920                             | B20.0465                  | 4,65                  | 25         | 58         | 4,65           |  |
| 154921                             | B20.0470                  | 4,70                  | 25         | 58         | 4,70           |  |
| 154922                             | B20.0475                  | 4,75                  | 27         | 62         | 4,75           |  |
| 154923                             | B20.0480                  | 4,80                  | 27         | 62         | 4,80           |  |
| 154924                             | B20.0485                  | 4,85                  | 27         | 62         | 4,85           |  |



## System/Système B20

|                      |                      |                                        |                                        |                                      |                                      |                                    |                       |                        |                         |                 |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|
| <b>ALU</b><br><10%Si | <b>ALU</b><br>>10%Si | <b>STEEL</b><br><1000N/mm <sup>2</sup> | <b>STEEL</b><br>>1000N/mm <sup>2</sup> | <b>INOX</b><br><850N/mm <sup>2</sup> | <b>INOX</b><br>>850N/mm <sup>2</sup> | <b>Ti</b><br>>850N/mm <sup>2</sup> | <b>CAST</b><br>GGG/GG | <b>Cu(Zn)</b><br>Au/Ag | <b>CFRP</b><br>Graphite | <b>Plastics</b> |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

### VHM-Spiralbohrer

2 Schneiden  
rechtsschneidend

Drallwinkel: 30°  
Spitzenwinkel: 118°

4-Flächen-Anschnitt

Verpackungseinheit: 5 Stück

### SC twist drills

2 flutes  
right-hand cutting

Helix angle: 30°  
Point angle: 118°

4-surface grinding

Packing unit: 5 pieces

### Foret hélicoïdal en carbure

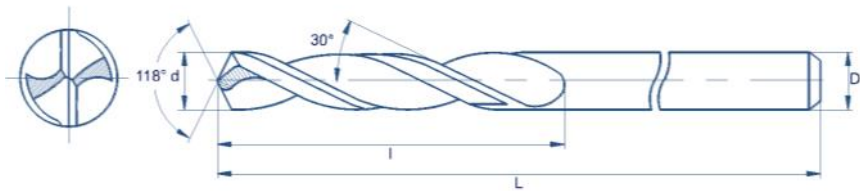
2 dents  
coupe à droite

Angle d'hélice: 30°  
Angle de pointe: 118°

Affûtage sur 4 surfaces

Unité d'emballage par 5

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref.<br>Réf. | Ø d<br>h6<br>in<br>mm | L<br>in<br>mm | ØD h6<br>in<br>mm |
|------------------------------------|---------------------------|-----------------------|---------------|-------------------|
| 154925                             | B20.0490                  | 4,90                  | 27            | 62                |
| 154926                             | B20.0495                  | 4,95                  | 27            | 62                |
| 154927                             | B20.0500                  | 5,00                  | 27            | 62                |
| 154928                             | B20.0505                  | 5,05                  | 27            | 62                |
| 149000                             | B20.0510                  | 5,10                  | 27            | 62                |
| 140532                             | B20.0515                  | 5,15                  | 27            | 62                |
| 140533                             | B20.0520                  | 5,20                  | 27            | 62                |
| 154929                             | B20.0525                  | 5,25                  | 27            | 62                |
| 154930                             | B20.0530                  | 5,30                  | 27            | 62                |
| 154931                             | B20.0535                  | 5,35                  | 29            | 66                |
| 154932                             | B20.0540                  | 5,40                  | 29            | 66                |
| 153085                             | B20.0545                  | 5,45                  | 29            | 66                |
| 154933                             | B20.0550                  | 5,50                  | 29            | 66                |
| 154934                             | B20.0555                  | 5,55                  | 29            | 66                |
| 154935                             | B20.0560                  | 5,60                  | 29            | 66                |
| 154936                             | B20.0565                  | 5,65                  | 29            | 66                |
| 154938                             | B20.0570                  | 5,70                  | 29            | 66                |
| 154939                             | B20.0575                  | 5,75                  | 29            | 66                |
| 154940                             | B20.0580                  | 5,80                  | 29            | 66                |
| 154941                             | B20.0585                  | 5,85                  | 29            | 66                |
| 154942                             | B20.0590                  | 5,90                  | 29            | 66                |
| 154943                             | B20.0595                  | 5,95                  | 29            | 66                |
| 154944                             | B20.0600                  | 6,00                  | 29            | 66                |
| 154945                             | B20.0610                  | 6,10                  | 32            | 70                |
| 154946                             | B20.0620                  | 6,20                  | 32            | 70                |
| 154947                             | B20.0630                  | 6,30                  | 32            | 70                |
| 154948                             | B20.0640                  | 6,40                  | 32            | 70                |
| 154949                             | B20.0650                  | 6,50                  | 32            | 70                |
| 154950                             | B20.0660                  | 6,60                  | 35            | 74                |



## System/Système B20

|                      |                      |                            |                            |                          |                          |                        |                       |                        |                         |                 |
|----------------------|----------------------|----------------------------|----------------------------|--------------------------|--------------------------|------------------------|-----------------------|------------------------|-------------------------|-----------------|
| <b>ALU</b><br><10%Si | <b>ALU</b><br>>10%Si | <b>STEEL</b><br><1000N/mm² | <b>STEEL</b><br>>1000N/mm² | <b>INOX</b><br><850N/mm² | <b>INOX</b><br>>850N/mm² | <b>Ti</b><br>>850N/mm² | <b>CAST</b><br>GGG/GG | <b>Cu(Zn)</b><br>Au/Ag | <b>CFRP</b><br>Graphite | <b>Plastics</b> |
|----------------------|----------------------|----------------------------|----------------------------|--------------------------|--------------------------|------------------------|-----------------------|------------------------|-------------------------|-----------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

### VHM-Spiralbohrer

2 Schneiden  
rechtsschneidend

Drallwinkel: 30°  
Spitzenwinkel: 118°

4-Flächen-Anschnitt

Verpackungseinheit: 5 Stück

### SC twist drills

2 flutes  
right-hand cutting

Helix angle: 30°  
Point angle: 118°

4-surface grinding

Packing unit: 5 pieces

### Foret hélicoïdal en carbure

2 dents  
coupe à droite

Angle d'hélice: 30°  
Angle de pointe: 118°

Affûtage sur 4 surfaces

Unité d'emballage par 5

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref.<br>Réf. | Ø d<br>h6<br>in mm | L<br>in mm | L<br>in mm | ØD h6<br>in mm |
|------------------------------------|---------------------------|--------------------|------------|------------|----------------|
| 153428                             | B20.0670                  | 6,70               | 35         | 74         | 6,70           |
| 154952                             | B20.0680                  | 6,80               | 35         | 74         | 6,80           |
| 154953                             | B20.0690                  | 6,90               | 35         | 74         | 6,90           |
| 154955                             | B20.0700                  | 7,00               | 35         | 74         | 7,00           |
| 154956                             | B20.0710                  | 7,10               | 35         | 74         | 7,10           |
| 154957                             | B20.0720                  | 7,20               | 35         | 74         | 7,20           |
| 154958                             | B20.0730                  | 7,30               | 35         | 74         | 7,30           |
| 154959                             | B20.0740                  | 7,40               | 35         | 74         | 7,40           |
| 154960                             | B20.0750                  | 7,50               | 35         | 74         | 7,50           |
| 154961                             | B20.0760                  | 7,60               | 38         | 79         | 7,60           |
| 154962                             | B20.0770                  | 7,70               | 38         | 79         | 7,70           |
| 154963                             | B20.0780                  | 7,80               | 38         | 79         | 7,80           |
| 154964                             | B20.0790                  | 7,90               | 38         | 79         | 7,90           |
| 154965                             | B20.0800                  | 8,00               | 38         | 79         | 8,00           |

Oben aufgeführte Werkzeuge ab Lager lieferbar

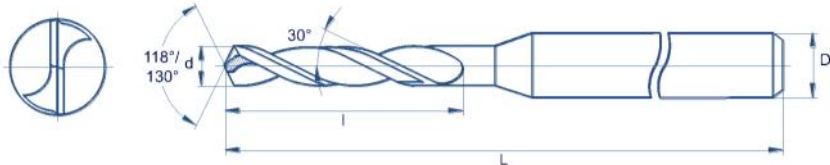
Tools listed above available from stock

Les outils susmentionnés sont en stock

Zwischenabmessungen kurzfristig lieferbar

Intermediate dimensions available at short notice

Dimensions intermédiaires livrables sous court délai



## System/Système D6981

|                      |                      |                                        |                                        |                                      |                                      |                                    |                       |                        |                         |                 |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|
| <b>ALU</b><br><10%Si | <b>ALU</b><br>>10%Si | <b>STEEL</b><br><1000N/mm <sup>2</sup> | <b>STEEL</b><br>>1000N/mm <sup>2</sup> | <b>INOX</b><br><850N/mm <sup>2</sup> | <b>INOX</b><br>>850N/mm <sup>2</sup> | <b>Ti</b><br>>850N/mm <sup>2</sup> | <b>CAST</b><br>GGG/GG | <b>Cu(Zn)</b><br>Au/Ag | <b>CFRP</b><br>Graphite | <b>Plastics</b> |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

### VHM-Mikro-Spiralbohrer, kurz, mit verstärktem Schaft (1,0/1,5)

2 Schneiden  
rechtsschneidend

Drallwinkel: 30°  
Spitzenwinkel:  
118° d < 0,4mm  
130° d ≥ 0,4mm

4-Flächen-Anschnitt

Verpackungseinheit: 10 Stück

### SC micro twist drills, short, with reinforced shank (1,0/1,5)

2 flutes  
right-hand cutting

Helix angle: 30°  
Point angle:  
118° d < 0,4mm  
130° d ≥ 0,4mm

4-surface grinding

Packing unit: 10 pieces

### Micro-foret hélicoïdal, court, en carbure avec man- che renforcée (1,0/1,5)

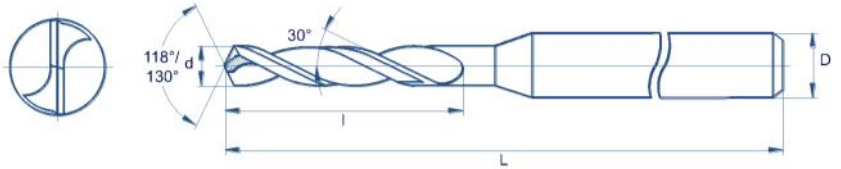
2 dents  
coupe à droite

Angle d'hélice: 30°  
Angle de pointe:  
118° d < 0,4mm  
130° d ≥ 0,4mm

Affûtage sur 4 surfaces

Unité d'emballage par 10

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref.<br>Réf. | Ø d<br>0/-0,004<br>in mm | l<br>in mm | L<br>in mm | ØD h6<br>in mm |  |
|------------------------------------|---------------------------|--------------------------|------------|------------|----------------|--|
| 154315                             | D6981.0050                | 0,05                     | 0,5        | 25         | 1              |  |
| 154317                             | D6981.0080                | 0,08                     | 0,5        | 25         | 1              |  |
| 154318                             | D6981.0090                | 0,09                     | 0,5        | 25         | 1              |  |
| 154320                             | D6981.0100                | 0,1                      | 0,5        | 25         | 1              |  |
| 154321                             | D6981.0110                | 0,11                     | 0,5        | 25         | 1              |  |
| 154322                             | D6981.0120                | 0,12                     | 0,5        | 25         | 1              |  |
| 154323                             | D6981.0130                | 0,13                     | 0,8        | 25         | 1              |  |
| 154324                             | D6981.0140                | 0,14                     | 0,8        | 25         | 1              |  |
| 154325                             | D6981.0150                | 0,15                     | 0,8        | 25         | 1              |  |
| 154326                             | D6981.0160                | 0,16                     | 1,1        | 25         | 1              |  |
| 154327                             | D6981.0170                | 0,17                     | 1,1        | 25         | 1              |  |
| 154328                             | D6981.0180                | 0,18                     | 1,1        | 25         | 1              |  |
| 154329                             | D6981.0190                | 0,19                     | 1,1        | 25         | 1              |  |
| 154330                             | D6981.0200                | 0,2                      | 1,5        | 25         | 1              |  |
| 154331                             | D6981.0210                | 0,21                     | 1,5        | 25         | 1              |  |
| 154332                             | D6981.0220                | 0,22                     | 1,5        | 25         | 1              |  |
| 154333                             | D6981.0230                | 0,23                     | 1,5        | 25         | 1              |  |
| 154334                             | D6981.0240                | 0,24                     | 1,5        | 25         | 1              |  |
| 154341                             | D6981.0245                | 0,245                    | 1,5        | 25         | 1              |  |
| 154335                             | D6981.0250                | 0,25                     | 1,9        | 25         | 1              |  |
| 154342                             | D6981.0255                | 0,255                    | 1,9        | 25         | 1              |  |
| 154336                             | D6981.0260                | 0,26                     | 1,9        | 25         | 1              |  |
| 154343                             | D6981.0265                | 0,265                    | 1,9        | 25         | 1              |  |
| 154337                             | D6981.0270                | 0,27                     | 1,9        | 25         | 1              |  |
| 154344                             | D6981.0275                | 0,275                    | 1,9        | 25         | 1              |  |
| 154338                             | D6981.0280                | 0,28                     | 1,9        | 25         | 1              |  |
| 154345                             | D6981.0285                | 0,285                    | 1,9        | 25         | 1              |  |
| 154339                             | D6981.0290                | 0,29                     | 1,9        | 25         | 1              |  |
| 154346                             | D6981.0295                | 0,295                    | 1,9        | 25         | 1              |  |
| 154340                             | D6981.0300                | 0,3                      | 1,9        | 25         | 1              |  |



## System/Système D6981

|                          |                          |                                            |                                            |                                          |                                          |                                        |                           |                            |                             |                     |
|--------------------------|--------------------------|--------------------------------------------|--------------------------------------------|------------------------------------------|------------------------------------------|----------------------------------------|---------------------------|----------------------------|-----------------------------|---------------------|
| <b>ALU</b><br><10%Si<br> | <b>ALU</b><br>>10%Si<br> | <b>STEEL</b><br><1000N/mm <sup>2</sup><br> | <b>STEEL</b><br>>1000N/mm <sup>2</sup><br> | <b>INOX</b><br><850N/mm <sup>2</sup><br> | <b>INOX</b><br>>850N/mm <sup>2</sup><br> | <b>Ti</b><br>>850N/mm <sup>2</sup><br> | <b>CAST</b><br>GGG/GG<br> | <b>Cu(Zn)</b><br>Au/Ag<br> | <b>CFRP</b><br>Graphite<br> | <b>Plastics</b><br> |
|--------------------------|--------------------------|--------------------------------------------|--------------------------------------------|------------------------------------------|------------------------------------------|----------------------------------------|---------------------------|----------------------------|-----------------------------|---------------------|

- optimal geeignet / first choice / premier choix

- geeignet / suitable / approprié

- nicht geeignet / suitable / pas approprié

### VHM-Mikro-Spiralbohrer, kurz, mit verstärktem Schaft (1,0/1,5)

2 Schneiden  
rechtsschneidend

Drallwinkel: 30°  
Spitzenwinkel:  
118° d < 0,4mm  
130° d ≥ 0,4mm

4-Flächen-Anschnitt

Verpackungseinheit: 10 Stück

### SC micro twist drills, short, with reinforced shank (1,0/1,5)

2 flutes  
right-hand cutting

Helix angle: 30°  
Point angle:  
118° d < 0,4mm  
130° d ≥ 0,4mm

4-surface grinding

Packing unit: 10 pieces

### Micro-foret hélicoïdal, court, en carbure avec manche renforcée (1,0/1,5)

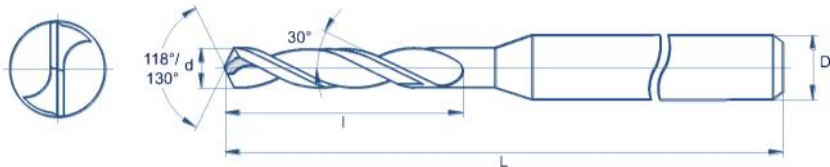
2 dents  
coupe à droite

Angle d'hélice: 30°  
Angle de pointe:  
118° d < 0,4mm  
130° d ≥ 0,4mm

Affûtage sur 4 surfaces

Unité d'emballage par 10

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref.<br>Réf. | Ø d<br>0/-0,004<br>in mm | l<br>in mm | L<br>in mm | ØD h6<br>in mm |  |
|------------------------------------|---------------------------|--------------------------|------------|------------|----------------|--|
| 154347                             | D6981.0305                | 0,305                    | 1,9        | 25         | 1              |  |
| 154348                             | D6981.0310                | 0,31                     | 2,4        | 25         | 1              |  |
| 154357                             | D6981.0315                | 0,315                    | 2,4        | 25         | 1              |  |
| 154349                             | D6981.0320                | 0,32                     | 2,4        | 25         | 1              |  |
| 154358                             | D6981.0325                | 0,325                    | 2,4        | 25         | 1              |  |
| 154350                             | D6981.0330                | 0,33                     | 2,4        | 25         | 1              |  |
| 154360                             | D6981.0335                | 0,335                    | 2,4        | 25         | 1              |  |
| 154351                             | D6981.0340                | 0,34                     | 2,4        | 25         | 1              |  |
| 154361                             | D6981.0345                | 0,345                    | 2,4        | 25         | 1              |  |
| 154352                             | D6981.0350                | 0,35                     | 2,4        | 25         | 1              |  |
| 154362                             | D6981.0355                | 0,355                    | 2,4        | 25         | 1              |  |
| 154353                             | D6981.0360                | 0,36                     | 2,4        | 25         | 1              |  |
| 154363                             | D6981.0365                | 0,365                    | 2,4        | 25         | 1              |  |
| 154354                             | D6981.0370                | 0,37                     | 2,4        | 25         | 1              |  |
| 154364                             | D6981.0375                | 0,375                    | 2,4        | 25         | 1              |  |
| 154355                             | D6981.0380                | 0,38                     | 2,4        | 25         | 1              |  |
| 154365                             | D6981.0385                | 0,385                    | 2,4        | 25         | 1              |  |
| 154356                             | D6981.0390                | 0,39                     | 2,7        | 25         | 1              |  |
| 154366                             | D6981.0395                | 0,395                    | 2,7        | 25         | 1              |  |
| 154367                             | D6981.0400                | 0,4                      | 2,7        | 25         | 1              |  |
| 154385                             | D6981.0405                | 0,405                    | 2,7        | 25         | 1              |  |
| 154368                             | D6981.0410                | 0,41                     | 2,7        | 25         | 1              |  |
| 154386                             | D6981.0415                | 0,415                    | 2,7        | 25         | 1              |  |
| 154369                             | D6981.0420                | 0,42                     | 2,7        | 25         | 1              |  |
| 154388                             | D6981.0425                | 0,425                    | 2,7        | 25         | 1              |  |
| 154370                             | D6981.0430                | 0,43                     | 2,7        | 25         | 1              |  |
| 154389                             | D6981.0435                | 0,435                    | 2,7        | 25         | 1              |  |
| 154371                             | D6981.0440                | 0,44                     | 2,7        | 25         | 1              |  |
| 154390                             | D6981.0445                | 0,445                    | 2,7        | 25         | 1              |  |
| 154372                             | D6981.0450                | 0,45                     | 2,7        | 25         | 1              |  |



## System/Système D6981

|                      |                      |                                        |                                        |                                      |                                      |                                    |                       |                        |                         |                 |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|
| <b>ALU</b><br><10%Si | <b>ALU</b><br>>10%Si | <b>STEEL</b><br><1000N/mm <sup>2</sup> | <b>STEEL</b><br>>1000N/mm <sup>2</sup> | <b>INOX</b><br><850N/mm <sup>2</sup> | <b>INOX</b><br>>850N/mm <sup>2</sup> | <b>Ti</b><br>>850N/mm <sup>2</sup> | <b>CAST</b><br>GGG/GG | <b>Cu(Zn)</b><br>Au/Ag | <b>CFRP</b><br>Graphite | <b>Plastics</b> |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

### VHM-Mikro-Spiralbohrer, kurz, mit verstärktem Schaft (1,0/1,5)

2 Schneiden  
rechtsschneidend

Drallwinkel: 30  
Spitzenwinkel:  
118° d < 0,4mm  
130° d ≥ 0,4mm

4-Flächen-Anschnitt

Verpackungseinheit: 10 Stück

### SC micro twist drills, short, with reinforced shank (1,0/1,5)

2 flutes  
right-hand cutting

Helix angle: 30°  
Point angle:  
118° d < 0,4mm  
130° d ≥ 0,4mm

4-surface grinding

Packing unit: 10 pieces

### Micro-foret hélicoïdal, court, en carbure avec manche renforcée (1,0/1,5)

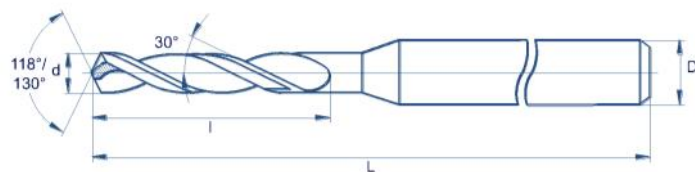
2 dents  
coupe à droite

Angle d'hélice: 30°  
Angle de pointe:  
118° d < 0,4mm  
130° d ≥ 0,4mm

Affûtage sur 4 surfaces

Unité d'emballage par 10

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref.<br>Réf. | Ø d<br>0/-0,004<br>in mm | l<br>in mm | L<br>in mm | ØD h6<br>in mm |  |
|------------------------------------|---------------------------|--------------------------|------------|------------|----------------|--|
| 154391                             | D6981.0455                | 0,455                    | 2,7        | 25         | 1              |  |
| 154373                             | D6981.0460                | 0,46                     | 2,7        | 25         | 1              |  |
| 154392                             | D6981.0465                | 0,465                    | 2,7        | 25         | 1              |  |
| 154374                             | D6981.0470                | 0,47                     | 2,7        | 25         | 1              |  |
| 154394                             | D6981.0475                | 0,475                    | 2,7        | 25         | 1              |  |
| 154375                             | D6981.0480                | 0,48                     | 2,7        | 25         | 1              |  |
| 154395                             | D6981.0485                | 0,485                    | 2,7        | 25         | 1              |  |
| 154376                             | D6981.0490                | 0,49                     | 3,2        | 25         | 1              |  |
| 154396                             | D6981.0495                | 0,495                    | 3,2        | 25         | 1              |  |
| 154377                             | D6981.0500                | 0,5                      | 3,2        | 25         | 1              |  |
| 154397                             | D6981.0505                | 0,505                    | 3,2        | 25         | 1              |  |
| 154378                             | D6981.0510                | 0,51                     | 3,2        | 25         | 1              |  |
| 154398                             | D6981.0515                | 0,515                    | 3,2        | 25         | 1              |  |
| 154379                             | D6981.0520                | 0,52                     | 3,2        | 25         | 1              |  |
| 154399                             | D6981.0525                | 0,525                    | 3,2        | 25         | 1              |  |
| 154380                             | D6981.0530                | 0,53                     | 3,2        | 25         | 1              |  |
| 154400                             | D6981.0535                | 0,535                    | 3,2        | 25         | 1              |  |
| 154381                             | D6981.0540                | 0,54                     | 3,6        | 25         | 1              |  |
| 154401                             | D6981.0545                | 0,545                    | 3,6        | 25         | 1              |  |
| 154382                             | D6981.0550                | 0,55                     | 3,6        | 25         | 1              |  |
| 154402                             | D6981.0555                | 0,555                    | 3,6        | 25         | 1              |  |
| 154403                             | D6981.0560                | 0,56                     | 3,6        | 25         | 1              |  |
| 154406                             | D6981.0570                | 0,57                     | 3,6        | 25         | 1              |  |
| 154408                             | D6981.0580                | 0,58                     | 3,6        | 25         | 1              |  |
| 154409                             | D6981.0590                | 0,59                     | 3,6        | 25         | 1              |  |
| 154410                             | D6981.0600                | 0,6                      | 3,6        | 25         | 1              |  |
| 154411                             | D6981.0610                | 0,61                     | 3,9        | 25         | 1              |  |
| 154412                             | D6981.0620                | 0,62                     | 3,9        | 25         | 1              |  |
| 154413                             | D6981.0630                | 0,63                     | 3,9        | 25         | 1              |  |
| 154414                             | D6981.0640                | 0,64                     | 3,9        | 25         | 1              |  |



## System/Système D6981

|                      |                      |                                        |                                        |                                      |                                      |                                    |                       |                        |                         |                 |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|
| <b>ALU</b><br><10%Si | <b>ALU</b><br>>10%Si | <b>STEEL</b><br><1000N/mm <sup>2</sup> | <b>STEEL</b><br>>1000N/mm <sup>2</sup> | <b>INOX</b><br><850N/mm <sup>2</sup> | <b>INOX</b><br>>850N/mm <sup>2</sup> | <b>Ti</b><br>>850N/mm <sup>2</sup> | <b>CAST</b><br>GGG/GG | <b>Cu(Zn)</b><br>Au/Ag | <b>CFRP</b><br>Graphite | <b>Plastics</b> |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

### VHM-Mikro-Spiralbohrer, kurz, mit verstärktem Schaft (1,0/1,5)

2 Schneiden  
rechtsschneidend

Drallwinkel: 30  
Spitzenwinkel:  
118° d < 0,4mm  
130° d ≥ 0,4mm

4-Flächen-Anschnitt

Verpackungseinheit: 10 Stück

### SC micro twist drills, short, with reinforced shank (1,0/1,5)

2 flutes  
right-hand cutting

Helix angle: 30°  
Point angle:  
118° d < 0,4mm  
130° d ≥ 0,4mm

4-surface grinding

Packing unit: 10 pieces

### Micro-foret hélicoïdal, court, en carbure avec manche renforcée (1,0/1,5)

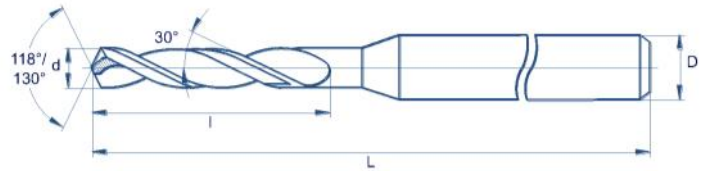
2 dents  
coupe à droite

Angle d'hélice: 30°  
Angle de pointe:  
118° d < 0,4mm  
130° d ≥ 0,4mm

Affûtage sur 4 surfaces

Unité d'emballage par 10

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref.<br>Réf. | Ø d<br>0/-0,004<br>in mm | l<br>in mm | L<br>in mm | ØD h6<br>in mm |  |
|------------------------------------|---------------------------|--------------------------|------------|------------|----------------|--|
| 154415                             | D6981.0650                | 0,65                     | 3,9        | 25         | 1              |  |
| 154417                             | D6981.0660                | 0,66                     | 3,9        | 25         | 1              |  |
| 154418                             | D6981.0670                | 0,67                     | 3,9        | 25         | 1              |  |
| 154419                             | D6981.0680                | 0,68                     | 4,5        | 25         | 1              |  |
| 154420                             | D6981.0690                | 0,69                     | 4,5        | 25         | 1              |  |
| 154421                             | D6981.0700                | 0,7                      | 4,5        | 25         | 1              |  |
| 154422                             | D6981.0710                | 0,71                     | 4,5        | 25         | 1              |  |
| 154423                             | D6981.0720                | 0,72                     | 4,5        | 25         | 1              |  |
| 154424                             | D6981.0730                | 0,73                     | 4,5        | 25         | 1              |  |
| 154425                             | D6981.0740                | 0,74                     | 4,5        | 25         | 1              |  |
| 154427                             | D6981.0750                | 0,75                     | 4,5        | 25         | 1              |  |
| 154428                             | D6981.0760                | 0,76                     | 5          | 25         | 1              |  |
| 154429                             | D6981.0770                | 0,77                     | 5          | 25         | 1              |  |
| 154430                             | D6981.0780                | 0,78                     | 5          | 25         | 1              |  |
| 154431                             | D6981.0790                | 0,79                     | 5          | 25         | 1              |  |
| 154432                             | D6981.0800                | 0,8                      | 5          | 25         | 1,5            |  |
| 154433                             | D6981.0810                | 0,81                     | 5          | 25         | 1,5            |  |
| 154434                             | D6981.0820                | 0,82                     | 5          | 25         | 1,5            |  |
| 154437                             | D6981.0830                | 0,83                     | 5          | 25         | 1,5            |  |
| 154438                             | D6981.0840                | 0,84                     | 5          | 25         | 1,5            |  |
| 154439                             | D6981.0850                | 0,85                     | 5          | 25         | 1,5            |  |
| 154440                             | D6981.0860                | 0,86                     | 6,5        | 25         | 1,5            |  |
| 154441                             | D6981.0870                | 0,87                     | 6,5        | 25         | 1,5            |  |
| 154442                             | D6981.0880                | 0,88                     | 6,5        | 25         | 1,5            |  |
| 154443                             | D6981.0890                | 0,89                     | 6,5        | 25         | 1,5            |  |
| 154444                             | D6981.0900                | 0,9                      | 6,5        | 25         | 1,5            |  |
| 154445                             | D6981.0910                | 0,91                     | 6,5        | 25         | 1,5            |  |
| 154446                             | D6981.0920                | 0,92                     | 6,5        | 25         | 1,5            |  |
| 154447                             | D6981.0930                | 0,93                     | 6,5        | 25         | 1,5            |  |
| 154448                             | D6981.0940                | 0,94                     | 6,5        | 25         | 1,5            |  |



## System/Système D6981

|                      |                      |                                        |                                        |                                      |                                      |                                    |                       |                        |                         |                 |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|
| <b>ALU</b><br><10%Si | <b>ALU</b><br>>10%Si | <b>STEEL</b><br><1000N/mm <sup>2</sup> | <b>STEEL</b><br>>1000N/mm <sup>2</sup> | <b>INOX</b><br><850N/mm <sup>2</sup> | <b>INOX</b><br>>850N/mm <sup>2</sup> | <b>Ti</b><br>>850N/mm <sup>2</sup> | <b>CAST</b><br>GGG/GG | <b>Cu(Zn)</b><br>Au/Ag | <b>CFRP</b><br>Graphite | <b>Plastics</b> |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

### VHM-Mikro-Spiralbohrer, kurz, mit verstärktem Schaft (1,0/1,5)

2 Schneiden  
rechtsschneidend

Drallwinkel: 30  
Spitzenwinkel:  
118° d < 0,4mm  
130° d ≥ 0,4mm

4-Flächen-Anschnitt

Verpackungseinheit: 10 Stück

### SC micro twist drills, short, with reinforced shank (1,0/1,5)

2 flutes  
right-hand cutting

Helix angle: 30°  
Point angle:  
118° d < 0,4mm  
130° d ≥ 0,4mm

4-surface grinding

Packing unit: 10 pieces

### Micro-foret hélicoïdal, court, en carbure avec manche renforcée (1,0/1,5)

2 dents  
coupe à droite

Angle d'hélice: 30°  
Angle de pointe:  
118° d < 0,4mm  
130° d ≥ 0,4mm

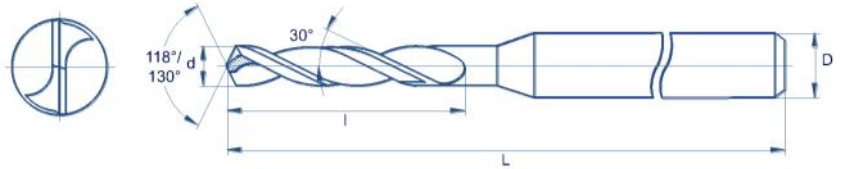
Affûtage sur 4 surfaces

Unité d'emballage par 10

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref.<br>Réf. | Ø d<br>in mm | l<br>in mm | L<br>in mm | ØD h6<br>in mm |  |
|------------------------------------|---------------------------|--------------|------------|------------|----------------|--|
| 154449                             | D6981.0950                | 0,95         | 6,5        | 25         | 1,5            |  |
| 154450                             | D6981.0960                | 0,96         | 6,5        | 25         | 1,5            |  |
| 154452                             | D6981.0970                | 0,97         | 6,5        | 25         | 1,5            |  |
| 154453                             | D6981.0980                | 0,98         | 6,5        | 25         | 1,5            |  |
| 154454                             | D6981.0990                | 0,99         | 6,5        | 25         | 1,5            |  |
| 154455                             | D6981.1000                | 1            | 6,5        | 25         | 1,5            |  |
| 154456                             | D6981.1010                | 1,01         | 6,5        | 25         | 1,5            |  |
| 154457                             | D6981.1020                | 1,02         | 6,5        | 25         | 1,5            |  |
| 154458                             | D6981.1030                | 1,03         | 6,5        | 25         | 1,5            |  |
| 154764                             | D6981.1040                | 1,04         | 6,5        | 25         | 1,5            |  |
| 154459                             | D6981.1050                | 1,05         | 6,5        | 25         | 1,5            |  |
| 154460                             | D6981.1100                | 1,1          | 7,3        | 25         | 1,5            |  |
| 154461                             | D6981.1150                | 1,15         | 7,3        | 25         | 1,5            |  |
| 154462                             | D6981.1200                | 1,2          | 8,2        | 25         | 1,5            |  |
| 154463                             | D6981.1250                | 1,25         | 8,2        | 25         | 1,5            |  |
| 154464                             | D6981.1300                | 1,3          | 8,2        | 25         | 1,5            |  |
| 154465                             | D6981.1350                | 1,35         | 9,2        | 25         | 1,5            |  |
| 154466                             | D6981.1400                | 1,4          | 9,2        | 25         | 1,5            |  |
| 154467                             | D6981.1450                | 1,45         | 9,2        | 25         | 1,5            |  |
| 154468                             | D6981.1500                | 1,5          | 9,2        | 25         | 1,5            |  |

Oben aufgeführte Werkzeuge ab Lager lieferbar  
Tools listed above available from stock  
Les outils susmentionnés sont en stock

Zwischenabmessungen kurzfristig lieferbar  
Intermediate dimensions available at short notice  
Dimensions intermédiaires livrables sous court délai



## System/Système D6961

|                      |                      |                                        |                                        |                                      |                                      |                                    |                       |                        |                         |                 |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|
| <b>ALU</b><br><10%Si | <b>ALU</b><br>>10%Si | <b>STEEL</b><br><1000N/mm <sup>2</sup> | <b>STEEL</b><br>>1000N/mm <sup>2</sup> | <b>INOX</b><br><850N/mm <sup>2</sup> | <b>INOX</b><br>>850N/mm <sup>2</sup> | <b>Ti</b><br>>850N/mm <sup>2</sup> | <b>CAST</b><br>GGG/GG | <b>Cu(Zn)</b><br>Au/Ag | <b>CFRP</b><br>Graphite | <b>Plastics</b> |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

### VHM-Mikro-Spiralbohrer, kurz, mit verstärktem Schaft 3,0 mm

2 Schneiden  
rechtsschneidend

Drallwinkel: 30°  
Spitzenwinkel:  
118° d < 0,4mm  
130° d ≥ 0,4mm

4-Flächen-Anschnitt

Verpackungseinheit: 10 Stück

### SC micro twist drills, short, with reinforced shank 3,0 mm

2 flutes  
right-hand cutting

Helix angle: 30°  
Point angle:  
118° d < 0,4mm  
130° d ≥ 0,4mm

4-surface grinding

Packing unit: 10 pieces

### Micro-foret hélicoïdal, court, en carbure avec man- che renforcée 3,0 mm

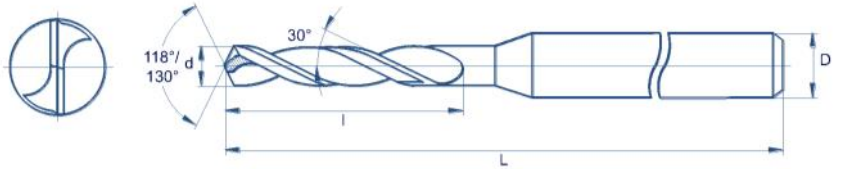
2 dents  
coupe à droite

Angle d'hélice: 30°  
Angle de pointe:  
118° d < 0,4mm  
130° d ≥ 0,4mm

Affûtage sur 4 surfaces

Unité d'emballage par 10

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. no.<br>Réf. | Ø d<br>h6<br>in mm | l<br>in mm | L<br>in mm | ØD h6<br>in mm |  |
|------------------------------------|-------------------------------|--------------------|------------|------------|----------------|--|
| 154489                             | D6961.0030                    | 0,03               | 0,3        | 38         | 3              |  |
| 154490                             | D6961.0040                    | 0,04               | 0,4        | 38         | 3              |  |
| 154491                             | D6961.0050                    | 0,05               | 0,5        | 38         | 3              |  |
| 154492                             | D6961.0060                    | 0,06               | 0,6        | 38         | 3              |  |
| 154493                             | D6961.0070                    | 0,07               | 0,7        | 38         | 3              |  |
| 154494                             | D6961.0080                    | 0,08               | 0,8        | 38         | 3              |  |
| 154495                             | D6961.0090                    | 0,09               | 0,9        | 38         | 3              |  |
| 154496                             | D6961.0100                    | 0,1                | 1          | 38         | 3              |  |
| 154497                             | D6961.0110                    | 0,11               | 1          | 38         | 3              |  |
| 154498                             | D6961.0120                    | 0,12               | 1,5        | 38         | 3              |  |
| 154499                             | D6961.0130                    | 0,13               | 1,5        | 38         | 3              |  |
| 154500                             | D6961.014                     | 0,14               | 1,5        | 38         | 3              |  |
| 154507                             | D6961.0150                    | 0,15               | 2          | 38         | 3              |  |
| 154508                             | D6961.0160                    | 0,16               | 2          | 38         | 3              |  |
| 154510                             | D6961.0170                    | 0,17               | 2          | 38         | 3              |  |
| 154511                             | D6961.0180                    | 0,18               | 2,5        | 38         | 3              |  |
| 154512                             | D6961.0190                    | 0,19               | 2,5        | 38         | 3              |  |
| 154513                             | D6961.0200                    | 0,2                | 2,5        | 38         | 3              |  |
| 154514                             | D6961.0210                    | 0,21               | 2,5        | 38         | 3              |  |
| 154515                             | D6961.0220                    | 0,22               | 2,5        | 38         | 3              |  |
| 154516                             | D6961.0230                    | 0,23               | 4          | 38         | 3              |  |
| 154517                             | D6961.0240                    | 0,24               | 4          | 38         | 3              |  |
| 154518                             | D6961.0250                    | 0,25               | 4          | 38         | 3              |  |
| 154519                             | D6961.0260                    | 0,26               | 4          | 38         | 3              |  |
| 154520                             | D6961.0270                    | 0,27               | 4          | 38         | 3              |  |
| 154521                             | D6961.0280                    | 0,28               | 4          | 38         | 3              |  |
| 154522                             | D6961.0290                    | 0,29               | 4          | 38         | 3              |  |



## System/Système D6961

|                      |                      |                                        |                                        |                                      |                                      |                                    |                       |                        |                         |                 |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|
| <b>ALU</b><br><10%Si | <b>ALU</b><br>>10%Si | <b>STEEL</b><br><1000N/mm <sup>2</sup> | <b>STEEL</b><br>>1000N/mm <sup>2</sup> | <b>INOX</b><br><850N/mm <sup>2</sup> | <b>INOX</b><br>>850N/mm <sup>2</sup> | <b>Ti</b><br>>850N/mm <sup>2</sup> | <b>CAST</b><br>GGG/GG | <b>Cu(Zn)</b><br>Au/Ag | <b>CFRP</b><br>Graphite | <b>Plastics</b> |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

### VHM-Mikro-Spiralbohrer, kurz, mit verstärktem Schaft 3,0 mm

2 Schneiden  
rechtsschneidend

Drallwinkel: 30°  
Spitzenwinkel:  
118° d < 0,4mm  
130° d ≥ 0,4mm

4-Flächen-Anschnitt

Verpackungseinheit: 10 Stück

### SC micro twist drills, short, with reinforced shank 3,0 mm

2 flutes  
right-hand cutting

Helix angle: 30°  
Point angle:  
118° d < 0,4mm  
130° d ≥ 0,4mm

4-surface grinding

Packing unit: 10 pieces

### Micro-foret hélicoïdal, court, en carbure avec man- che renforcée 3,0 mm

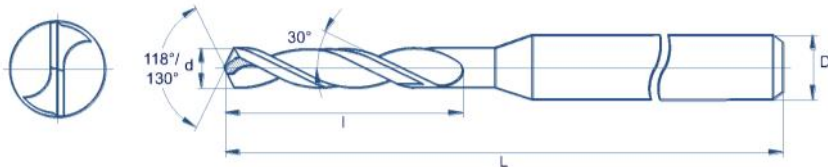
2 dents  
coupe à droite

Angle d'hélice: 30°  
Angle de pointe:  
118° d < 0,4mm  
130° d ≥ 0,4mm

Affûtage sur 4 surfaces

Unité d'emballage par 10

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. no.<br>Réf. | Ø d<br>h6<br>in mm | l<br>in mm | L<br>in mm | ØD h6<br>in mm |
|------------------------------------|-------------------------------|--------------------|------------|------------|----------------|
| 154523                             | D6961.0300                    | 0,3                | 5,5        | 38         | 3              |
| 154524                             | D6961.0310                    | 0,31               | 5,5        | 38         | 3              |
| 154525                             | D6961.0320                    | 0,32               | 5,5        | 38         | 3              |
| 154526                             | D6961.0330                    | 0,33               | 5,5        | 38         | 3              |
| 154527                             | D6961.0340                    | 0,34               | 5,5        | 38         | 3              |
| 154528                             | D6961.0350                    | 0,35               | 5,5        | 38         | 3              |
| 154529                             | D6961.0360                    | 0,36               | 5,5        | 38         | 3              |
| 154530                             | D6961.0370                    | 0,37               | 5,5        | 38         | 3              |
| 154531                             | D6961.0380                    | 0,38               | 5,5        | 38         | 3              |
| 154533                             | D6961.0390                    | 0,39               | 5,5        | 38         | 3              |
| 154534                             | D6961.0400                    | 0,4                | 6          | 38         | 3              |
| 154535                             | D6961.0450                    | 0,45               | 6          | 38         | 3              |
| 154536                             | D6961.0500                    | 0,5                | 6          | 38         | 3              |
| 154537                             | D6961.0550                    | 0,55               | 8          | 38         | 3              |
| 154539                             | D6961.0600                    | 0,6                | 8          | 38         | 3              |
| 154540                             | D6961.0650                    | 0,65               | 8          | 38         | 3              |
| 154541                             | D6961.0700                    | 0,7                | 8          | 38         | 3              |
| 154543                             | D6961.0750                    | 0,75               | 8          | 38         | 3              |
| 154544                             | D6961.0800                    | 0,8                | 8          | 38         | 3              |
| 154545                             | D6961.0850                    | 0,85               | 8          | 38         | 3              |
| 154546                             | D6961.0900                    | 0,9                | 8          | 38         | 3              |
| 154547                             | D6961.0950                    | 0,95               | 8          | 38         | 3              |
| 154548                             | D6961.1000                    | 1                  | 10         | 38         | 3              |
| 154549                             | D6961.1050                    | 1,05               | 10         | 38         | 3              |
| 154550                             | D6961.1100                    | 1,1                | 10         | 38         | 3              |
| 154551                             | D6961.1150                    | 1,15               | 10         | 38         | 3              |
| 154552                             | D6961.1200                    | 1,2                | 10         | 38         | 3              |



## System/Système D6961

|                      |                      |                                        |                                        |                                      |                                      |                                    |                       |                        |                         |                 |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|
| <b>ALU</b><br><10%Si | <b>ALU</b><br>>10%Si | <b>STEEL</b><br><1000N/mm <sup>2</sup> | <b>STEEL</b><br>>1000N/mm <sup>2</sup> | <b>INOX</b><br><850N/mm <sup>2</sup> | <b>INOX</b><br>>850N/mm <sup>2</sup> | <b>Ti</b><br>>850N/mm <sup>2</sup> | <b>CAST</b><br>GGG/GG | <b>Cu(Zn)</b><br>Au/Ag | <b>CFRP</b><br>Graphite | <b>Plastics</b> |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

### VHM-Mikro-Spiralbohrer, kurz, mit verstärktem Schaft 3,0 mm

2 Schneiden  
rechtsschneidend

Drallwinkel: 30°  
Spitzenwinkel:  
118° d < 0,4mm  
130° d ≥ 0,4mm

4-Flächen-Anschnitt

Verpackungseinheit: 10 Stück

### SC micro twist drills, short, with reinforced shank 3,0 mm

2 flutes  
right-hand cutting

Helix angle: 30°  
Point angle:  
118° d < 0,4mm  
130° d ≥ 0,4mm

4-surface grinding

Packing unit: 10 pieces

### Micro-foret hélicoïdal, court, en carbure avec man- che renforcée 3,0 mm

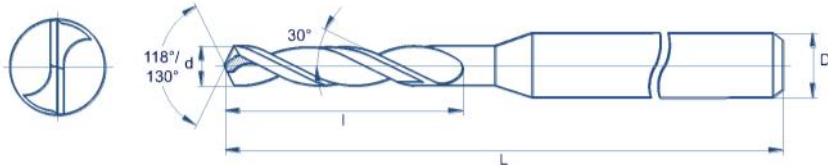
2 dents  
coupe à droite

Angle d'hélice: 30°  
Angle de pointe:  
118° d < 0,4mm  
130° d ≥ 0,4mm

Affûtage sur 4 surfaces

Unité d'emballage par 10

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. no.<br>Réf. | Ø d<br>h6<br>in mm | L<br>in mm | ØD h6<br>in mm |
|------------------------------------|-------------------------------|--------------------|------------|----------------|
| 154553                             | D6961.1250                    | 1,25               | 10         | 38             |
| 154554                             | D6961.1300                    | 1,3                | 10         | 38             |
| 154555                             | D6961.1350                    | 1,35               | 10         | 38             |
| 154556                             | D6961.1400                    | 1,4                | 10         | 38             |
| 154557                             | D6961.1450                    | 1,45               | 10         | 38             |
| 154558                             | D6961.1500                    | 1,5                | 12         | 38             |
| 154559                             | D6961.1550                    | 1,55               | 12         | 38             |
| 154560                             | D6961.1600                    | 1,6                | 12         | 38             |
| 154561                             | D6961.1650                    | 1,65               | 12         | 38             |
| 154562                             | D6961.1700                    | 1,7                | 12         | 38             |
| 154563                             | D6961.1750                    | 1,75               | 12         | 38             |
| 154564                             | D6961.1800                    | 1,8                | 12         | 38             |
| 154565                             | D6961.1850                    | 1,85               | 12         | 38             |
| 154566                             | D6961.1900                    | 1,9                | 12         | 38             |
| 154567                             | D6961.1950                    | 1,95               | 12         | 38             |
| 154568                             | D6961.2000                    | 2                  | 12         | 38             |
| 154569                             | D6961.2050                    | 2,05               | 12         | 38             |
| 154570                             | D6961.2100                    | 2,1                | 12         | 38             |
| 154571                             | D6961.2150                    | 2,15               | 12         | 38             |
| 154572                             | D6961.2200                    | 2,2                | 12         | 38             |
| 154573                             | D6961.2250                    | 2,25               | 12         | 38             |
| 154574                             | D6961.2300                    | 2,3                | 12         | 38             |
| 154575                             | D6961.2350                    | 2,35               | 12         | 38             |
| 154576                             | D6961.2400                    | 2,4                | 12         | 38             |
| 154577                             | D6961.2450                    | 2,45               | 12         | 38             |
| 154578                             | D6961.2500                    | 2,5                | 12         | 38             |
| 154579                             | D6961.2550                    | 2,55               | 12         | 38             |



## System/Système D6961

|                          |                          |                                            |                                            |                                          |                                          |                                        |                           |                            |                             |                     |
|--------------------------|--------------------------|--------------------------------------------|--------------------------------------------|------------------------------------------|------------------------------------------|----------------------------------------|---------------------------|----------------------------|-----------------------------|---------------------|
| <b>ALU</b><br><10%Si<br> | <b>ALU</b><br>>10%Si<br> | <b>STEEL</b><br><1000N/mm <sup>2</sup><br> | <b>STEEL</b><br>>1000N/mm <sup>2</sup><br> | <b>INOX</b><br><850N/mm <sup>2</sup><br> | <b>INOX</b><br>>850N/mm <sup>2</sup><br> | <b>Ti</b><br>>850N/mm <sup>2</sup><br> | <b>CAST</b><br>GGG/GG<br> | <b>Cu(Zn)</b><br>Au/Ag<br> | <b>CFRP</b><br>Graphite<br> | <b>Plastics</b><br> |
|--------------------------|--------------------------|--------------------------------------------|--------------------------------------------|------------------------------------------|------------------------------------------|----------------------------------------|---------------------------|----------------------------|-----------------------------|---------------------|

- optimal geeignet / first choice / premier choix

- geeignet / suitable / approprié

- nicht geeignet / suitable / pas approprié

### VHM-Mikro-Spiralbohrer, kurz, mit verstärktem Schaft 3,0 mm

2 Schneiden  
rechtsschneidend

Drallwinkel: 30°  
Spitzenwinkel:  
118° d < 0,4mm  
130° d ≥ 0,4mm

4-Flächen-Anschnitt

Verpackungseinheit: 10 Stück

### SC micro twist drills, short, with reinforced shank 3,0 mm

2 flutes  
right-hand cutting

Helix angle: 30°  
Point angle:  
118° d < 0,4mm  
130° d ≥ 0,4mm

4-surface grinding

Packing unit: 10 pieces

### Micro-foret hélicoïdal, court, en carbure avec man- che renforcée 3,0 mm

2 dents  
coupe à droite

Angle d'hélice: 30°  
Angle de pointe:  
118° d < 0,4mm  
130° d ≥ 0,4mm

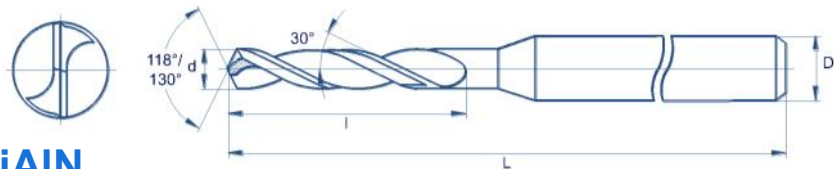
Affûtage sur 4 surfaces

Unité d'emballage par 10

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. no.<br>Réf. | Ø d<br>h6<br>in mm | l<br>in mm | L<br>in mm | ØD h6<br>in mm |  |
|------------------------------------|-------------------------------|--------------------|------------|------------|----------------|--|
| 154580                             | D6961.2600                    | 2,6                | 12         | 38         | 3              |  |
| 154581                             | D6961.2650                    | 2,65               | 12         | 38         | 3              |  |
| 154582                             | D6961.2700                    | 2,7                | 12         | 38         | 3              |  |
| 154583                             | D6961.2750                    | 2,75               | 12         | 38         | 3              |  |
| 154584                             | D6961.2800                    | 2,8                | 12         | 38         | 3              |  |
| 154585                             | D6961.2850                    | 2,85               | 12         | 38         | 3              |  |
| 154586                             | D6961.2900                    | 2,9                | 12         | 38         | 3              |  |
| 154587                             | D6961.2950                    | 2,95               | 12         | 38         | 3              |  |
| 154589                             | D6961.3000                    | 3                  | 12         | 38         | 3              |  |
|                                    |                               |                    |            |            |                |  |

Oben aufgeführte Werkzeuge ab Lager lieferbar  
Tools listed above available from stock  
Les outils susmentionnés sont en stock

Zwischenabmessungen kurzfristig lieferbar  
Intermediate dimensions available at short notice  
Dimensions intermédiaires livrables sous court délai



## System/Système D6961F TiAlN

|                      |                      |                                        |                                        |                                      |                                      |                                    |                       |                        |                         |                 |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|
| <b>ALU</b><br><10%Si | <b>ALU</b><br>>10%Si | <b>STEEL</b><br><1000N/mm <sup>2</sup> | <b>STEEL</b><br>>1000N/mm <sup>2</sup> | <b>INOX</b><br><850N/mm <sup>2</sup> | <b>INOX</b><br>>850N/mm <sup>2</sup> | <b>Ti</b><br>>850N/mm <sup>2</sup> | <b>CAST</b><br>GGG/GG | <b>Cu(Zn)</b><br>Au/Ag | <b>CFRP</b><br>Graphite | <b>Plastics</b> |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

**VHM-Mikro-Spiralbohrer,  
kurz, mit verstärktem Schaft  
3,0 mm  
TiAlN beschichtet**

2 Schneiden  
rechtsschneidend

Drallwinkel: 30°  
Spitzenwinkel:  
118° d < 0,4mm  
130° d ≥ 0,4mm

4-Flächen-Anschnitt

**SC micro twist drill with  
reinforced shank 3,0 mm  
TiAlN coated**

2 flutes  
right-hand cutting

Helix angle: 30°  
Point angle:  
118° d < 0,4mm  
130° d ≥ 0,4mm

4-surface-grinding

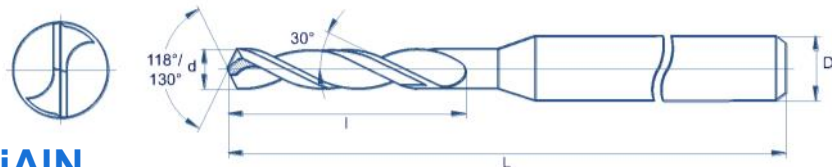
**Micro-foret hélicoïdal,  
court, en carbure avec man-  
che renforcée 3,0 mm  
Revêtement: TiAlN**

2 dents  
coupe à droite

Angle d'hélice: 30°  
Angle de pointe:  
118° d < 0,4mm  
130° d ≥ 0,4mm

Affûtage sur 4 surfaces

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. no.<br>Réf. | Ø d<br>h6<br>in mm | l<br>in mm | L<br>in mm | ØD h6<br>in mm |  |
|------------------------------------|-------------------------------|--------------------|------------|------------|----------------|--|
| 154590                             | D6961F.0100                   | 0,1                | 1          | 38         | 3              |  |
| 154591                             | D6961F.0150                   | 0,15               | 2          | 38         | 3              |  |
| 154592                             | D6961F.0200                   | 0,2                | 2,5        | 38         | 3              |  |
| 154593                             | D6961F.0250                   | 0,25               | 4          | 38         | 3              |  |
| 154595                             | D6961F.0300                   | 0,3                | 5,5        | 38         | 3              |  |
| 154596                             | D6961F.0350                   | 0,35               | 5,5        | 38         | 3              |  |
| 154598                             | D6961F.0400                   | 0,4                | 6          | 38         | 3              |  |
| 154599                             | D6961F.0450                   | 0,45               | 6          | 38         | 3              |  |
| 154600                             | D6961F.0500                   | 0,5                | 6          | 38         | 3              |  |
| 154601                             | D6961F.0550                   | 0,55               | 8          | 38         | 3              |  |
| 154602                             | D6961F.0600                   | 0,6                | 8          | 38         | 3              |  |
| 154603                             | D6961F.0650                   | 0,65               | 8          | 38         | 3              |  |
| 154604                             | D6961F.0700                   | 0,7                | 8          | 38         | 3              |  |
| 154605                             | D6961F.0750                   | 0,75               | 8          | 38         | 3              |  |
| 154606                             | D6961F.0800                   | 0,8                | 8          | 38         | 3              |  |
| 154607                             | D6961F.0900                   | 0,9                | 8          | 38         | 3              |  |
| 154608                             | D6961F.0950                   | 0,95               | 8          | 38         | 3              |  |
| 154609                             | D6961F.0970                   | 0,97               | 8          | 38         | 3              |  |
| 154610                             | D6961F.0980                   | 0,98               | 8          | 38         | 3              |  |
| 154611                             | D6961F.0990                   | 0,99               | 8          | 38         | 3              |  |
| 154612                             | D6961F.1000                   | 1                  | 10         | 38         | 3              |  |
| 154613                             | D6961F.1010                   | 1,01               | 10         | 38         | 3              |  |
| 154614                             | D6961F.1020                   | 1,02               | 10         | 38         | 3              |  |
| 154615                             | D6961F.1030                   | 1,03               | 10         | 38         | 3              |  |
| 154616                             | D6961F.1050                   | 1,05               | 10         | 38         | 3              |  |
| 154617                             | D6961F.1100                   | 1,1                | 10         | 38         | 3              |  |
| 154618                             | D6961F.1150                   | 1,15               | 10         | 38         | 3              |  |
| 154619                             | D6961F.1200                   | 1,2                | 10         | 38         | 3              |  |
| 154620                             | D6961F.1250                   | 1,25               | 10         | 38         | 3              |  |
| 154621                             | D6961F.1300                   | 1,3                | 10         | 38         | 3              |  |



# System/Système D6961F TiAlN

|                      |                      |                                        |                                        |                                      |                                      |                                    |                       |                        |                         |                 |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|
| <b>ALU</b><br><10%Si | <b>ALU</b><br>>10%Si | <b>STEEL</b><br><1000N/mm <sup>2</sup> | <b>STEEL</b><br>>1000N/mm <sup>2</sup> | <b>INOX</b><br><850N/mm <sup>2</sup> | <b>INOX</b><br>>850N/mm <sup>2</sup> | <b>Ti</b><br>>850N/mm <sup>2</sup> | <b>CAST</b><br>GGG/GG | <b>Cu(Zn)</b><br>Au/Ag | <b>CFRP</b><br>Graphite | <b>Plastics</b> |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

**VHM-Mikro-Spiralbohrer,  
kurz, mit verstärktem Schaft  
3,0 mm  
TiAlN beschichtet**

2 Schneiden  
rechtsschneidend

Drallwinkel: 30°  
Spitzenwinkel:  
118° d < 0,4mm  
130° d ≥ 0,4mm

4-Flächen-Anschnitt

**SC micro twist drill with  
reinforced shank 3,0 mm  
TiAlN coated**

2 flutes  
right-hand cutting

Helix angle: 30°  
Point angle:  
118° d < 0,4mm  
130° d ≥ 0,4mm

4-surface-grinding

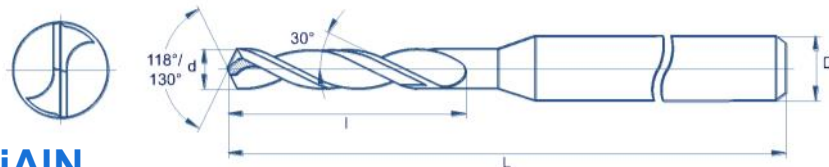
**Micro-foret hélicoïdal,  
court, en carbure avec man-  
che renforcée 3,0 mm  
Revêtement: TiAlN**

2 dents  
coupe à droite

Angle d'hélice: 30°  
Angle de pointe:  
118° d < 0,4mm  
130° d ≥ 0,4mm

Affûtage sur 4 surfaces

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. no.<br>Réf. | Ø d<br>h6<br>in mm | l<br>in mm | L<br>in mm | ØD h6<br>in mm |  |
|------------------------------------|-------------------------------|--------------------|------------|------------|----------------|--|
| 154622                             | D6961F.1350                   | 1,35               | 10         | 38         | 3              |  |
| 154623                             | D6961F.1400                   | 1,4                | 10         | 38         | 3              |  |
| 154625                             | D6961F.1450                   | 1,45               | 10         | 38         | 3              |  |
| 154626                             | D6961F.1470                   | 1,47               | 10         | 38         | 3              |  |
| 154633                             | D6961F.1480                   | 1,48               | 10         | 38         | 3              |  |
| 154634                             | D6961F.1490                   | 1,49               | 10         | 38         | 3              |  |
| 154635                             | D6961F.1500                   | 1,5                | 12         | 38         | 3              |  |
| 154636                             | D6961F.1510                   | 1,51               | 12         | 38         | 3              |  |
| 154637                             | D6961F.1520                   | 1,52               | 12         | 38         | 3              |  |
| 154638                             | D6961F.1530                   | 1,53               | 12         | 38         | 3              |  |
| 154640                             | D6961F.1550                   | 1,55               | 12         | 38         | 3              |  |
| 154641                             | D6961F.1600                   | 1,6                | 12         | 38         | 3              |  |
| 154642                             | D6961F.1650                   | 1,65               | 12         | 38         | 3              |  |
| 154643                             | D6961F.1700                   | 1,7                | 12         | 38         | 3              |  |
| 154645                             | D6961F.1750                   | 1,75               | 12         | 38         | 3              |  |
| 154646                             | D6961F.1800                   | 1,8                | 12         | 38         | 3              |  |
| 154647                             | D6961F.1900                   | 1,9                | 12         | 38         | 3              |  |
| 154648                             | D6961F.1950                   | 1,95               | 12         | 38         | 3              |  |
| 154649                             | D6961F.1970                   | 1,97               | 12         | 38         | 3              |  |
| 154650                             | D6961F.1980                   | 1,98               | 12         | 38         | 3              |  |
| 154651                             | D6961F.1990                   | 1,99               | 12         | 38         | 3              |  |
| 154652                             | D6961F.2000                   | 2                  | 12         | 38         | 3              |  |
| 154653                             | D6961F.2010                   | 2,01               | 12         | 38         | 3              |  |
| 154654                             | D6961F.2020                   | 2,02               | 12         | 38         | 3              |  |
| 154655                             | D6961F.2030                   | 2,03               | 12         | 38         | 3              |  |
| 154656                             | D6961F.2050                   | 2,05               | 12         | 38         | 3              |  |
| 154657                             | D6961F.2100                   | 2,1                | 12         | 38         | 3              |  |
| 154658                             | D6961F.2150                   | 2,15               | 12         | 38         | 3              |  |
| 154659                             | D6961F.2200                   | 2,2                | 12         | 38         | 3              |  |
| 154660                             | D6961F.2250                   | 2,25               | 12         | 38         | 3              |  |



## System/Système D6961F TiAlN

|                      |                      |                                        |                                        |                                      |                                      |                                    |                       |                        |                         |                 |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|
| <b>ALU</b><br><10%Si | <b>ALU</b><br>>10%Si | <b>STEEL</b><br><1000N/mm <sup>2</sup> | <b>STEEL</b><br>>1000N/mm <sup>2</sup> | <b>INOX</b><br><850N/mm <sup>2</sup> | <b>INOX</b><br>>850N/mm <sup>2</sup> | <b>Ti</b><br>>850N/mm <sup>2</sup> | <b>CAST</b><br>GGG/GG | <b>Cu(Zn)</b><br>Au/Ag | <b>CFRP</b><br>Graphite | <b>Plastics</b> |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

**VHM-Mikro-Spiralbohrer,  
kurz, mit verstärktem Schaft  
3,0 mm  
TiAlN beschichtet**

2 Schneiden  
rechtsschneidend

Drallwinkel: 30°  
Spitzenwinkel:  
118° d < 0,4mm  
130° d ≥ 0,4mm

4-Flächen-Anschnitt

**SC micro twist drill with  
reinforced shank 3,0 mm  
TiAlN coated**

2 flutes  
right-hand cutting

Helix angle: 30°  
Point angle:  
118° d < 0,4mm  
130° d ≥ 0,4mm

4-surface-grinding

**Micro-foret hélicoïdal,  
court, en carbure avec man-  
che renforcée 3,0 mm  
Revêtement: TiAlN**

2 dents  
coupe à droite

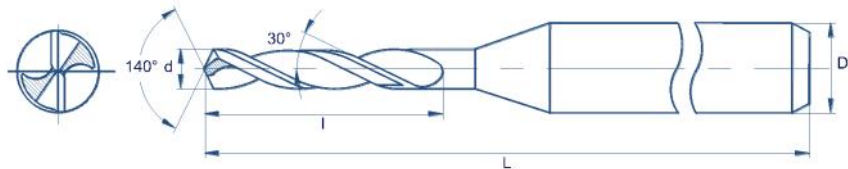
Angle d'hélice: 30°  
Angle de pointe:  
118° d < 0,4mm  
130° d ≥ 0,4mm

Affûtage sur 4 surfaces

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. no.<br>Réf. | Ø d<br>h6<br>in mm | l<br>in mm | L<br>in mm | ØD h6<br>in mm |
|------------------------------------|-------------------------------|--------------------|------------|------------|----------------|
| 154661                             | D6961F.2300                   | 2,3                | 12         | 38         | 3              |
| 154662                             | D6961F.2350                   | 2,35               | 12         | 38         | 3              |
| 154663                             | D6961F.2400                   | 2,4                | 12         | 38         | 3              |
| 154664                             | D6961F.2450                   | 2,45               | 12         | 38         | 3              |
| 154665                             | D6961F.2500                   | 2,5                | 12         | 38         | 3              |
| 154666                             | D6961F.2510                   | 2,51               | 12         | 38         | 3              |
| 154667                             | D6961F.2520                   | 2,52               | 12         | 38         | 3              |
| 154668                             | D6961F.2530                   | 2,53               | 12         | 38         | 3              |
| 154669                             | D6961F.2550                   | 2,55               | 12         | 38         | 3              |
| 154670                             | D6961F.2600                   | 2,6                | 12         | 38         | 3              |
| 154671                             | D6961F.2650                   | 2,65               | 12         | 38         | 3              |
| 154672                             | D6961F.2700                   | 2,7                | 12         | 38         | 3              |
| 154673                             | D6961F.2750                   | 2,75               | 12         | 38         | 3              |
| 154674                             | D6961F.2800                   | 2,8                | 12         | 38         | 3              |
| 154675                             | D6961F.2850                   | 2,85               | 12         | 38         | 3              |
| 154676                             | D6961F.2900                   | 2,9                | 12         | 38         | 3              |
| 154677                             | D6961F.2950                   | 2,95               | 12         | 38         | 3              |
| 154678                             | D6961F.2960                   | 2,96               | 12         | 38         | 3              |
| 154679                             | D6961F.2970                   | 2,97               | 12         | 38         | 3              |
| 154680                             | D6961F.2980                   | 2,98               | 12         | 38         | 3              |
| 154681                             | D6961F.2990                   | 2,99               | 12         | 38         | 3              |
| 154682                             | D6961F.3000                   | 3                  | 12         | 38         | 3              |

Oben aufgeführte Werkzeuge ab Lager lieferbar  
Tools listed above available from stock  
Les outils susmentionnés sont en stock

Zwischenabmessungen kurzfristig lieferbar  
Intermediate dimensions available at short notice  
Dimensions intermédiaires livrables sous court délai



## System/Système D2101

|                           |                           |                                             |                                             |                                           |                                           |                                         |                            |                             |                              |                      |
|---------------------------|---------------------------|---------------------------------------------|---------------------------------------------|-------------------------------------------|-------------------------------------------|-----------------------------------------|----------------------------|-----------------------------|------------------------------|----------------------|
| <b>ALU</b><br><10%Si<br>● | <b>ALU</b><br>>10%Si<br>● | <b>STEEL</b><br><1000N/mm <sup>2</sup><br>● | <b>STEEL</b><br>>1000N/mm <sup>2</sup><br>● | <b>INOX</b><br><850N/mm <sup>2</sup><br>● | <b>INOX</b><br>>850N/mm <sup>2</sup><br>● | <b>Ti</b><br>>850N/mm <sup>2</sup><br>● | <b>CAST</b><br>GGG/GG<br>● | <b>Cu(Zn)</b><br>Au/Ag<br>● | <b>CFRP</b><br>Graphite<br>● | <b>Plastics</b><br>● |
|---------------------------|---------------------------|---------------------------------------------|---------------------------------------------|-------------------------------------------|-------------------------------------------|-----------------------------------------|----------------------------|-----------------------------|------------------------------|----------------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

### VHM-Spiralbohrer mit verstärktem Schaft 6,0 mm

unbeschichtet

2 Schneiden  
rechtsschneidend

Drallwinkel: 30°  
Spitzenwinkel: 140°

4-Flächen-Anschnitt

### SC twist drills with reinforced shank 6,0 mm

uncoated

2 flutes  
right-hand cutting

Helix angle: 30°  
Point angle: 140°

4-surface grinding

### Foret hélicoïdal en carbure avec manche renforcée 6,0 mm

non revêtue

2 dents  
coupe à droite

Angle d'hélice: 30°  
Angle de pointe: 140°

Affûtage sur 4 surfaces

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. no.<br>Réf. | Ø d<br>h6<br>in mm | l<br>in mm | L<br>in mm | ØD h6<br>in mm |  |
|------------------------------------|-------------------------------|--------------------|------------|------------|----------------|--|
| 154684                             | D2101.3000                    | 3,0                | 20,0       | 60,0       | 6,0            |  |
| 154685                             | D2101.4000                    | 4,0                | 24,0       | 60,0       | 6,0            |  |
| 154686                             | D2101.5000                    | 5,0                | 28,0       | 60,0       | 6,0            |  |
| 154687                             | D2101.6000                    | 6,0                | 28,0       | 60,0       | 6,0            |  |
|                                    |                               |                    |            |            |                |  |
|                                    |                               |                    |            |            |                |  |
|                                    |                               |                    |            |            |                |  |

Oben aufgeführte Werkzeuge ab Lager lieferbar

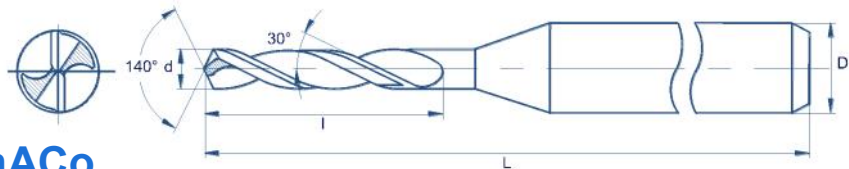
Tools listed above available from stock

Les outils susmentionnés sont en stock

Zwischenabmessungen kurzfristig lieferbar

Intermediate dimensions available at short notice

Dimensions intermédiaires livrables sous court délai



## System/Système D2101N nACo

|                           |                           |                                             |                                             |                                           |                                           |                                         |                            |                             |                              |                      |
|---------------------------|---------------------------|---------------------------------------------|---------------------------------------------|-------------------------------------------|-------------------------------------------|-----------------------------------------|----------------------------|-----------------------------|------------------------------|----------------------|
| <b>ALU</b><br><10%Si<br>● | <b>ALU</b><br>>10%Si<br>● | <b>STEEL</b><br><1000N/mm <sup>2</sup><br>● | <b>STEEL</b><br>>1000N/mm <sup>2</sup><br>● | <b>INOX</b><br><850N/mm <sup>2</sup><br>● | <b>INOX</b><br>>850N/mm <sup>2</sup><br>● | <b>Ti</b><br>>850N/mm <sup>2</sup><br>● | <b>CAST</b><br>GGG/GG<br>● | <b>Cu(Zn)</b><br>Au/Ag<br>● | <b>CFRP</b><br>Graphite<br>● | <b>Plastics</b><br>● |
|---------------------------|---------------------------|---------------------------------------------|---------------------------------------------|-------------------------------------------|-------------------------------------------|-----------------------------------------|----------------------------|-----------------------------|------------------------------|----------------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

### VHM-Spiralbohrer mit verstärktem Schaft 6,0 mm

nACo-beschichtet

2 Schneiden  
rechtsschneidend

Drallwinkel: 30°  
Spitzenwinkel: 140°

4-Flächen-Anschnitt

### SC twist drills with reinforced shank 6,0 mm

nACo-coated

2 flutes  
right-hand cutting

Helix angle: 30°  
Point angle: 140°

4-surface grinding

### Foret hélicoïdal en carbure avec manche renforcée 6,0 mm

revêtement: nACo

2 dents  
coupe à droite

Angle d'hélice: 30°  
Angle de pointe: 140°

Affûtage sur 4 surfaces

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. no.<br>Réf. | Ø d<br>h6<br>in mm | l<br>in mm | L<br>in mm | ØD h6<br>in mm |  |
|------------------------------------|-------------------------------|--------------------|------------|------------|----------------|--|
| 154688                             | D2101N.3000                   | 3,0                | 20,0       | 60,0       | 6,0            |  |
| 154689                             | D2101N.4000                   | 4,0                | 24,0       | 60,0       | 6,0            |  |
| 154690                             | D2101N.5000                   | 5,0                | 28,0       | 60,0       | 6,0            |  |
| 154691                             | D2101N.6000                   | 6,0                | 28,0       | 60,0       | 6,0            |  |
|                                    |                               |                    |            |            |                |  |
|                                    |                               |                    |            |            |                |  |
|                                    |                               |                    |            |            |                |  |

Oben aufgeführte Werkzeuge ab Lager lieferbar

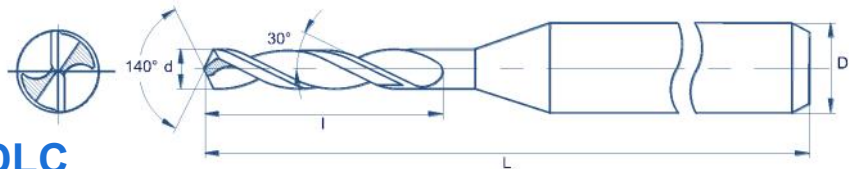
Tools listed above available from stock

Les outils susmentionnés sont en stock

Zwischenabmessungen kurzfristig lieferbar

Intermediate dimensions available at short notice

Dimensions intermédiaires livrables sous court délai



## System/Système D2101C DLC

|                      |                      |                                        |                                        |                                      |                                      |                                    |                       |                        |                         |                 |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|
| <b>ALU</b><br><10%Si | <b>ALU</b><br>>10%Si | <b>STEEL</b><br><1000N/mm <sup>2</sup> | <b>STEEL</b><br>>1000N/mm <sup>2</sup> | <b>INOX</b><br><850N/mm <sup>2</sup> | <b>INOX</b><br>>850N/mm <sup>2</sup> | <b>Ti</b><br>>850N/mm <sup>2</sup> | <b>CAST</b><br>GGG/GG | <b>Cu(Zn)</b><br>Au/Ag | <b>CFRP</b><br>Graphite | <b>Plastics</b> |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

### VHM-Spiralbohrer mit verstärktem Schaft 6,0 mm

DLC-beschichtet

2 Schneiden  
rechtsschneidend

Drallwinkel: 30°  
Spitzenwinkel: 140°

4-Flächen-Anschnitt

### SC twist drills with reinforced shank 6,0 mm

DLC-coated

2 flutes  
right-hand cutting

Helix angle: 30°  
Point angle: 140°

4-surface grinding

### Foret hélicoïdal en carbure avec manche renforcée 6,0 mm

revêtement: DLC

2 dents  
coupe à droite

Angle d'hélice: 30°  
Angle de pointe: 140°

Affûtage sur 4 surfaces

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. no.<br>Réf. | Ø d<br>h6<br>in mm | l<br>in mm | L<br>in mm | ØD h6<br>in mm |  |
|------------------------------------|-------------------------------|--------------------|------------|------------|----------------|--|
| 154692                             | D2101C.3000                   | 3,0                | 20,0       | 60,0       | 6,0            |  |
| 154693                             | D2101C.4000                   | 4,0                | 24,0       | 60,0       | 6,0            |  |
| 154694                             | D2101C.5000                   | 5,0                | 28,0       | 60,0       | 6,0            |  |
| 154695                             | D2101C.6000                   | 6,0                | 28,0       | 60,0       | 6,0            |  |
|                                    |                               |                    |            |            |                |  |
|                                    |                               |                    |            |            |                |  |
|                                    |                               |                    |            |            |                |  |

Oben aufgeführte Werkzeuge ab Lager lieferbar

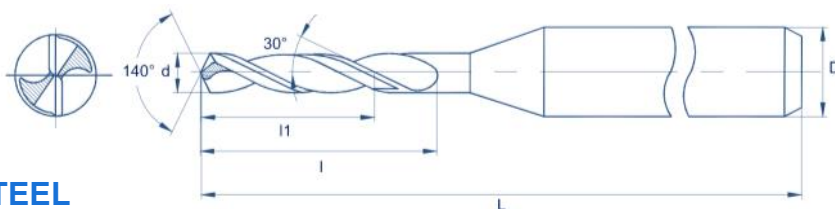
Tools listed above available from stock

Les outils susmentionnés sont en stock

Zwischenabmessungen kurzfristig lieferbar

Intermediate dimensions available at short notice

Dimensions intermédiaires livrables sous court délai



## System/Système D6941F STEEL

|                      |                      |                            |                            |                          |                          |                        |                       |                        |                         |                 |
|----------------------|----------------------|----------------------------|----------------------------|--------------------------|--------------------------|------------------------|-----------------------|------------------------|-------------------------|-----------------|
| <b>ALU</b><br><10%Si | <b>ALU</b><br>>10%Si | <b>STEEL</b><br><1000N/mm² | <b>STEEL</b><br>>1000N/mm² | <b>INOX</b><br><850N/mm² | <b>INOX</b><br>>850N/mm² | <b>Ti</b><br>>850N/mm² | <b>CAST</b><br>GGG/GG | <b>Cu(Zn)</b><br>Au/Ag | <b>CFRP</b><br>Graphite | <b>Plastics</b> |
|----------------------|----------------------|----------------------------|----------------------------|--------------------------|--------------------------|------------------------|-----------------------|------------------------|-------------------------|-----------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

### VHM-Mikro-Hochleistungsbohrer STEEL 5xD TiAlN beschichtet

2 Schneiden  
rechtsschneidend  
  
Drallwinkel: 30°  
Spitzenwinkel: 140°  
  
4-Flächen-Anschnitt

### SC micro high performance drill HPC STEEL 5xD TiAlN coated

2 flutes  
right-hand cutting  
  
Helix angle: 30°  
Point angle: 140°  
  
4-surface grinding

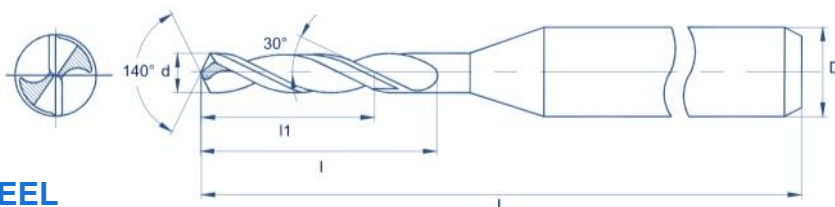
### Micro-foret haute perfor- mance HPC en carbure STEEL 5xD Revêtement: TiAlN

2 dents  
coupe à droite  
  
Angle d'hélice: 30°  
Angle de pointe: 140°  
  
Affûtage sur 4 surfaces

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. no.<br>Réf. | Ø d<br>h6<br>in mm | l1<br>in mm | l<br>in mm | L<br>in mm | ØD<br>h6<br>in mm |  |
|------------------------------------|-------------------------------|--------------------|-------------|------------|------------|-------------------|--|
| 154702                             | D6941F-5D.0500                | 0,50               | 3,3         | 4,5        | 38         | 3                 |  |
| 154703                             | D6941F-5D.0600                | 0,60               | 3,3         | 4,5        | 38         | 3                 |  |
| 154704                             | D6941F-5D.0700                | 0,70               | 4,0         | 5,5        | 38         | 3                 |  |
| 154705                             | D6941F-5D.0800                | 0,80               | 4,0         | 5,5        | 38         | 3                 |  |
| 154706                             | D6941F-5D.0900                | 0,90               | 5,0         | 6,0        | 38         | 3                 |  |
| 154707                             | D6941F-5D.1000                | 1,00               | 5,0         | 6,0        | 38         | 3                 |  |
| 154708                             | D6941F-5D.1100                | 1,10               | 8,0         | 10         | 38         | 3                 |  |
| 154709                             | D6941F-5D.1200                | 1,20               | 8,0         | 10         | 38         | 3                 |  |
| 154710                             | D6941F-5D.1300                | 1,30               | 8,0         | 10         | 38         | 3                 |  |
| 154711                             | D6941F-5D.1400                | 1,40               | 8,0         | 10         | 38         | 3                 |  |
| 154712                             | D6941F-5D.1500                | 1,50               | 8,0         | 10         | 38         | 3                 |  |
| 154713                             | D6941F-5D.1600                | 1,60               | 11          | 14         | 38         | 3                 |  |
| 154714                             | D6941F-5D.1700                | 1,70               | 11          | 14         | 38         | 3                 |  |
| 154715                             | D6941F-5D.1800                | 1,80               | 11          | 14         | 38         | 3                 |  |
| 154716                             | D6941F-5D.1900                | 1,90               | 11          | 14         | 38         | 3                 |  |
| 154717                             | D6941F-5D.2000                | 2,00               | 11          | 14         | 38         | 3                 |  |
| 154718                             | D6941F-5D.2100                | 2,10               | 14          | 18         | 50         | 3                 |  |
| 154719                             | D6941F-5D.2200                | 2,20               | 14          | 18         | 50         | 3                 |  |
| 154720                             | D6941F-5D.2300                | 2,30               | 14          | 18         | 50         | 3                 |  |
| 154721                             | D6941F-5D.2400                | 2,40               | 14          | 18         | 50         | 3                 |  |
| 154723                             | D6941F-5D.2500                | 2,50               | 14          | 18         | 50         | 3                 |  |
| 154724                             | D6941F-5D.2600                | 2,60               | 16          | 20         | 50         | 3                 |  |
| 154725                             | D6941F-5D.2700                | 2,70               | 16          | 20         | 50         | 3                 |  |
| 154726                             | D6941F-5D.2800                | 2,80               | 16          | 20         | 50         | 3                 |  |
| 154727                             | D6941F-5D.2900                | 2,90               | 16          | 20         | 50         | 3                 |  |
| 154729                             | D6941F-5D.3000                | 3,00               | 23          | 28         | 66         | 4                 |  |

Oben aufgeführte Werkzeuge ab Lager lieferbar  
Tools listed above available from stock  
Les outils susmentionnés sont en stock

Zwischenabmessungen kurzfristig lieferbar  
Intermediate dimensions available at short notice  
Dimensions intermédiaires livrables sous court délai



## System/Système D6941F STEEL

|                      |                      |                            |                            |                          |                          |                        |                       |                        |                         |                 |
|----------------------|----------------------|----------------------------|----------------------------|--------------------------|--------------------------|------------------------|-----------------------|------------------------|-------------------------|-----------------|
| <b>ALU</b><br><10%Si | <b>ALU</b><br>>10%Si | <b>STEEL</b><br><1000N/mm² | <b>STEEL</b><br>>1000N/mm² | <b>INOX</b><br><850N/mm² | <b>INOX</b><br>>850N/mm² | <b>Ti</b><br>>850N/mm² | <b>CAST</b><br>GGG/GG | <b>Cu(Zn)</b><br>Au/Ag | <b>CFRP</b><br>Graphite | <b>Plastics</b> |
|----------------------|----------------------|----------------------------|----------------------------|--------------------------|--------------------------|------------------------|-----------------------|------------------------|-------------------------|-----------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

### VHM-Mikro-Hochleistungsbohrer STEEL 10xD TiAlN beschichtet

2 Schneiden  
rechtsschneidend  
  
Drallwinkel: 30°  
Spitzenwinkel: 140°  
  
4-Flächen-Anschnitt

### SC micro high performance drill HPC STEEL 10xD TiAlN coated

2 flutes  
right-hand cutting  
  
Helix angle: 30°  
Point angle: 140°  
  
4-surface grinding

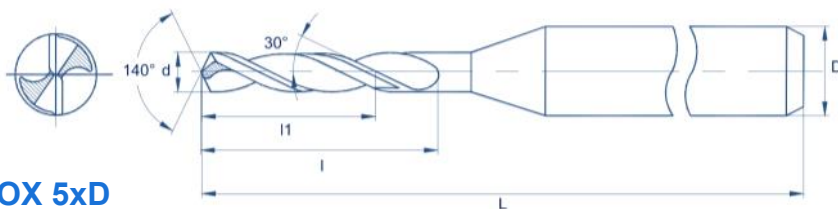
### Micro-foret haute perfor- mance HPC en carbure STEEL 10xD Revêtement: TiAlN

2 dents  
coupe à droite  
  
Angle d'hélice: 30°  
Angle de pointe: 140°  
  
Affûtage sur 4 surfaces

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Order Nr.<br>Réf. | Ø d<br>h6<br>in mm | l1<br>in mm | l<br>in mm | L<br>in mm | ØD<br>h6<br>in mm |  |
|------------------------------------|--------------------------------|--------------------|-------------|------------|------------|-------------------|--|
| 154730                             | D6941F-10D.0500                | 0,50               | 6,0         | 8,0        | 38,0       | 3,0               |  |
| 154731                             | D6941F-10D.0600                | 0,60               | 6,0         | 8,0        | 38,0       | 3,0               |  |
| 154732                             | D6941F-10D.0700                | 0,70               | 8,0         | 10,0       | 38,0       | 3,0               |  |
| 154733                             | D6941F-10D.0800                | 0,80               | 6,0         | 10,0       | 38,0       | 3,0               |  |
| 154735                             | D6941F-10D.0900                | 0,90               | 10,0        | 12,0       | 38,0       | 3,0               |  |
| 154736                             | D6941F-10D.1000                | 1,00               | 10,0        | 12,0       | 38,0       | 3,0               |  |
| 154737                             | D6941F-10D.1100                | 1,10               | 16,0        | 20,0       | 50,0       | 3,0               |  |
| 154738                             | D6941F-10D.1200                | 1,20               | 16,0        | 20,0       | 50,0       | 3,0               |  |
| 154739                             | D6941F-10D.1300                | 1,30               | 16,0        | 20,0       | 50,0       | 3,0               |  |
| 154740                             | D6941F-10D.1400                | 1,40               | 16,0        | 20,0       | 50,0       | 3,0               |  |
| 154741                             | D6941F-10D.1500                | 1,50               | 16,0        | 20,0       | 50,0       | 3,0               |  |
| 154742                             | D6941F-10D.1600                | 1,60               | 22,0        | 30,0       | 66,0       | 3,0               |  |
| 154743                             | D6941F-10D.1700                | 1,70               | 22,0        | 30,0       | 66,0       | 3,0               |  |
| 154744                             | D6941F-10D.1800                | 1,80               | 22,0        | 30,0       | 66,0       | 3,0               |  |
| 154745                             | D6941F-10D.1900                | 1,90               | 22,0        | 30,0       | 66,0       | 3,0               |  |
| 154746                             | D6941F-10D.2000                | 2,00               | 22,0        | 30,0       | 66,0       | 3,0               |  |
| 154747                             | D6941F-10D.2100                | 2,10               | 25,0        | 35,0       | 74,0       | 3,0               |  |
| 154748                             | D6941F-10D.2200                | 2,20               | 25,0        | 35,0       | 74,0       | 3,0               |  |
| 154749                             | D6941F-10D.2300                | 2,30               | 25,0        | 35,0       | 74,0       | 3,0               |  |
| 154750                             | D6941F-10D.2400                | 2,40               | 25,0        | 35,0       | 74,0       | 3,0               |  |
| 154751                             | D6941F-10D.2500                | 2,50               | 25,0        | 35,0       | 74,0       | 3,0               |  |
| 154752                             | D6941F-10D.2600                | 2,60               | 32,0        | 40,0       | 82,0       | 3,0               |  |
| 154754                             | D6941F-10D.2700                | 2,70               | 32,0        | 40,0       | 82,0       | 3,0               |  |
| 154755                             | D6941F-10D.2800                | 2,80               | 32,0        | 40,0       | 82,0       | 3,0               |  |
| 154757                             | D6941F-10D.2900                | 2,90               | 32,0        | 40,0       | 82,0       | 3,0               |  |
| 154758                             | D6941F-10D.3000                | 3,00               | 46,0        | 55,0       | 95,0       | 4,0               |  |

Oben aufgeführte Werkzeuge ab Lager lieferbar  
Tools listed above available from stock  
Les outils susmentionnés sont en stock

Zwischenabmessungen kurzfristig lieferbar  
Intermediate dimensions available at short notice  
Dimensions intermédiaires livrables sous court délai



## System/Système D2131F INOX 5xD

|                      |                      |                            |                            |                          |                          |                        |                       |                        |                         |                 |
|----------------------|----------------------|----------------------------|----------------------------|--------------------------|--------------------------|------------------------|-----------------------|------------------------|-------------------------|-----------------|
| <b>ALU</b><br><10%Si | <b>ALU</b><br>>10%Si | <b>STEEL</b><br><1000N/mm² | <b>STEEL</b><br>>1000N/mm² | <b>INOX</b><br><850N/mm² | <b>INOX</b><br>>850N/mm² | <b>Ti</b><br>>850N/mm² | <b>CAST</b><br>GGG/GG | <b>Cu(Zn)</b><br>Au/Ag | <b>CFRP</b><br>Graphite | <b>Plastics</b> |
|----------------------|----------------------|----------------------------|----------------------------|--------------------------|--------------------------|------------------------|-----------------------|------------------------|-------------------------|-----------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

### VHM-Mikro-Hochleistungsbohrer INOX 5xD TiAlN beschichtet

2 Schneiden  
rechtsschneidend

Drallwinkel: 30°  
Spitzenwinkel: 140°

4-Flächen-Anschnitt

### SC micro high performance drill HPC INOX 5xD TiAlN coated

2 flutes  
right-hand cutting

Helix angle: 30°  
Point angle: 140°

4-surface grinding

### Micro-foret haute perfor- mance HPC en carbure INOX 5xD Revêtement: TiAlN

2 dents  
coupe à droite

Angle d'hélice: 30°  
Angle de pointe: 140°

Affûtage sur 4 surfaces

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. no.<br>Réf. | Ø d<br>h6<br>in mm | l1<br>in mm | l<br>in mm | L<br>in mm | ØD<br>h6<br>in mm |  |
|------------------------------------|-------------------------------|--------------------|-------------|------------|------------|-------------------|--|
| 154766                             | D2131F-5D.0500                | 0,50               | 3,3         | 4,5        | 38         | 3                 |  |
| 154767                             | D2131F-5D.0600                | 0,60               | 3,3         | 4,5        | 38         | 3                 |  |
| 154768                             | D2131F-5D.0700                | 0,70               | 4,0         | 5,5        | 38         | 3                 |  |
| 154769                             | D2131F-5D.0800                | 0,80               | 4,0         | 5,5        | 38         | 3                 |  |
| 154771                             | D2131F-5D.0900                | 0,90               | 5,0         | 6,0        | 38         | 3                 |  |
| 154772                             | D2131F-5D.1000                | 1,00               | 5,0         | 6,0        | 38         | 3                 |  |
| 154773                             | D2131F-5D.1100                | 1,10               | 8,0         | 10         | 38         | 3                 |  |
| 154774                             | D2131F-5D.1200                | 1,20               | 8,0         | 10         | 38         | 3                 |  |
| 154775                             | D2131F-5D.1300                | 1,30               | 8,0         | 10         | 38         | 3                 |  |
| 154776                             | D2131F-5D.1400                | 1,40               | 8,0         | 10         | 38         | 3                 |  |
| 154777                             | D2131F-5D.1500                | 1,50               | 8,0         | 10         | 38         | 3                 |  |
| 154778                             | D2131F-5D.1600                | 1,60               | 11          | 14         | 38         | 3                 |  |
| 154779                             | D2131F-5D.1700                | 1,70               | 11          | 14         | 38         | 3                 |  |
| 154780                             | D2131F-5D.1800                | 1,80               | 11          | 14         | 38         | 3                 |  |
| 154781                             | D2131F-5D.1900                | 1,90               | 11          | 14         | 38         | 3                 |  |
| 154784                             | D2131F-5D.2.000               | 2,00               | 11          | 14         | 38         | 3                 |  |
| 154785                             | D2131F-5D.2.100               | 2,10               | 14          | 18         | 50         | 3                 |  |
| 154786                             | D2131F-5D.2.200               | 2,20               | 14          | 18         | 50         | 3                 |  |
| 154787                             | D2131F-5D.2.300               | 2,30               | 14          | 18         | 50         | 3                 |  |
| 154788                             | D2131F-5D.2.400               | 2,40               | 14          | 18         | 50         | 3                 |  |
| 154789                             | D2131F-5D.2.500               | 2,50               | 14          | 18         | 50         | 3                 |  |
| 154790                             | D2131F-5D.2.600               | 2,60               | 16          | 20         | 50         | 3                 |  |
| 154791                             | D2131F-5D.2.700               | 2,70               | 16          | 20         | 50         | 3                 |  |
| 154792                             | D2131F-5D.2.800               | 2,80               | 16          | 20         | 50         | 3                 |  |
| 154793                             | D2131F-5D.2.900               | 2,90               | 16          | 20         | 50         | 3                 |  |
| 154794                             | D2131F-5D.3000                | 3,00               | 23          | 28         | 66         | 4                 |  |

Oben aufgeführte Werkzeuge ab Lager lieferbar

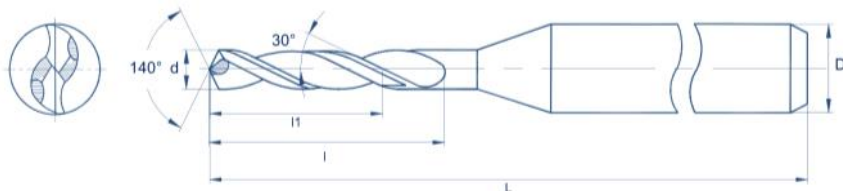
Tools listed above available from stock

Les outils susmentionnés sont en stock

Zwischenabmessungen kurzfristig lieferbar

Intermediate dimensions available at short notice

Dimensions intermédiaires livrables sous court délai



## System/Système D6401

|                      |                      |                                        |                                        |                                      |                                      |                                    |                       |                        |                         |                 |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|
| <b>ALU</b><br><10%Si | <b>ALU</b><br>>10%Si | <b>STEEL</b><br><1000N/mm <sup>2</sup> | <b>STEEL</b><br>>1000N/mm <sup>2</sup> | <b>INOX</b><br><850N/mm <sup>2</sup> | <b>INOX</b><br>>850N/mm <sup>2</sup> | <b>Ti</b><br>>850N/mm <sup>2</sup> | <b>CAST</b><br>GGG/GG | <b>Cu(Zn)</b><br>Au/Ag | <b>CFRP</b><br>Graphite | <b>Plastics</b> |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

### VHM-Mikro-Hochleistungsbohrer ALU 5xD mit polierter Schneide

2 Schneiden  
rechtsschneidend

Drallwinkel: 30°  
Spitzenwinkel: 140°

4-Flächen-Anschnitt

### SC micro drills HPC ALU 5xD with polished flutes

2 flutes  
right-hand cutting

Helix angle: 30°  
Point angle: 140°

Chamfer: 4 facet pointing

### Micro-foret hélicoïdal HPC en carbure ALU 5xD avec coupes polies

2 dents  
coupe à droite

Angle d'hélice: 30°  
Angle de pointe: 140°

Affûtage: 4 facettes

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Order Nr.<br>Réf. | Ø d<br>h6<br>in mm | l1<br>in mm | l<br>in mm | L<br>in mm | ØD<br>h6<br>in mm |  |
|------------------------------------|--------------------------------|--------------------|-------------|------------|------------|-------------------|--|
| 154795                             | D6401P-5D.0500                 | 0,50               | 3,3         | 4,5        | 38         | 3                 |  |
| 154798                             | D6401P-5D.0600                 | 0,60               | 3,3         | 4,5        | 38         | 3                 |  |
| 154799                             | D6401P-5D.0700                 | 0,70               | 4,0         | 5,5        | 38         | 3                 |  |
| 154800                             | D6401P-5D.0800                 | 0,80               | 4,0         | 5,5        | 38         | 3                 |  |
| 154801                             | D6401P-5D.0900                 | 0,90               | 5,0         | 6,0        | 38         | 3                 |  |
| 154802                             | D6401P-5D.1000                 | 1,00               | 5,0         | 6,0        | 38         | 3                 |  |
| 154803                             | D6401P-5D.1100                 | 1,10               | 8,0         | 10         | 38         | 3                 |  |
| 154804                             | D6401P-5D.1200                 | 1,20               | 8,0         | 10         | 38         | 3                 |  |
| 154805                             | D6401P-5D.1300                 | 1,30               | 8,0         | 10         | 38         | 3                 |  |
| 154806                             | D6401P-5D.1400                 | 1,40               | 8,0         | 10         | 38         | 3                 |  |
| 154807                             | D6401P-5D.1500                 | 1,50               | 8,0         | 10         | 38         | 3                 |  |
| 154808                             | D6401P-5D.1600                 | 1,60               | 11          | 14         | 38         | 3                 |  |
| 154809                             | D6401P-5D.1700                 | 1,70               | 11          | 14         | 38         | 3                 |  |
| 154810                             | D6401P-5D.1800                 | 1,80               | 11          | 14         | 38         | 3                 |  |
| 154811                             | D6401P-5D.1900                 | 1,90               | 11          | 14         | 38         | 3                 |  |
| 154812                             | D6401P-5D.2000                 | 2,00               | 11          | 14         | 38         | 3                 |  |
| 154813                             | D6401P-5D.2100                 | 2,10               | 14          | 18         | 50         | 3                 |  |
| 154814                             | D6401P-5D.2200                 | 2,20               | 14          | 18         | 50         | 3                 |  |
| 154815                             | D6401P-5D.2300                 | 2,30               | 14          | 18         | 50         | 3                 |  |
| 154816                             | D6401P-5D.2400                 | 2,40               | 14          | 18         | 50         | 3                 |  |
| 154817                             | D6401P-5D.2500                 | 2,50               | 14          | 18         | 50         | 3                 |  |
| 154818                             | D6401P-5D.2600                 | 2,60               | 16          | 20         | 50         | 3                 |  |
| 154819                             | D6401P-5D.2700                 | 2,70               | 16          | 20         | 50         | 3                 |  |
| 154820                             | D6401P-5D.2800                 | 2,80               | 16          | 20         | 50         | 3                 |  |
| 154821                             | D6401P-5D.2900                 | 2,90               | 16          | 20         | 50         | 3                 |  |
| 154822                             | D6401P-5D.3000                 | 3,00               | 23          | 28         | 66         | 4                 |  |

Oben aufgeführte Werkzeuge ab Lager lieferbar

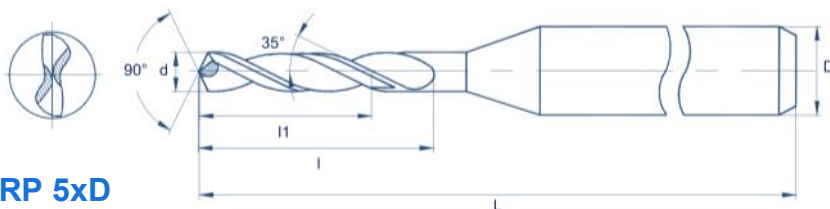
Tools listed above available from stock

Les outils susmentionnés sont en stock

Zwischenabmessungen kurzfristig lieferbar

Intermediate dimensions available at short notice

Dimensions intermédiaires livrables sous court délai



## System/Système D6601D CFRP 5xD

|                      |                      |                            |                            |                          |                          |                        |                       |                        |                         |                 |
|----------------------|----------------------|----------------------------|----------------------------|--------------------------|--------------------------|------------------------|-----------------------|------------------------|-------------------------|-----------------|
| <b>ALU</b><br><10%Si | <b>ALU</b><br>>10%Si | <b>STEEL</b><br><1000N/mm² | <b>STEEL</b><br>>1000N/mm² | <b>INOX</b><br><850N/mm² | <b>INOX</b><br>>850N/mm² | <b>Ti</b><br>>850N/mm² | <b>CAST</b><br>GGG/GG | <b>Cu(Zn)</b><br>Au/Ag | <b>CFRP</b><br>Graphite | <b>Plastics</b> |
|----------------------|----------------------|----------------------------|----------------------------|--------------------------|--------------------------|------------------------|-----------------------|------------------------|-------------------------|-----------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

### VHM-Mikro-Hochleistungsbohrer CFRP 5xD Diamant beschichtet

2 Schneiden  
rechtsschneidend  
  
Drallwinkel: 35°  
Spitzenwinkel: 90°  
  
4-Flächen-Anschnitt

### SC micro high performance drills HPC CFRP 5xD Diamond coated

2 flutes  
right-hand cutting  
  
Helix angle: 35°  
Point angle: 90°  
  
4-surface grinding

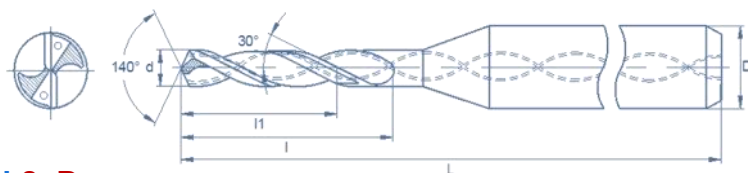
### Micro-foret haute perfor- mance HPC en carbure PRFC/PRFV 5xD Revêtement: diamant

2 dents  
coupe à droite  
  
Angle d'hélice: 35°  
Angle de pointe: 90°  
  
Affûtage sur 4 surfaces

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. no.<br>Réf. | Ø d<br>h7<br>in mm | l1<br>in mm | l<br>in mm | L<br>in mm | ØD<br>h6<br>in mm |  |
|------------------------------------|-------------------------------|--------------------|-------------|------------|------------|-------------------|--|
| 154824                             | D6601D-5D.0500                | 0,50               | 3,3         | 4,5        | 38         | 3                 |  |
| 154825                             | D6601D-5D.0600                | 0,60               | 3,3         | 4,5        | 38         | 3                 |  |
| 154826                             | D6601D-5D.0700                | 0,70               | 4,0         | 5,5        | 38         | 3                 |  |
| 154827                             | D6601D-5D.0800                | 0,80               | 4,0         | 5,5        | 38         | 3                 |  |
| 154828                             | D6601D-5D.0900                | 0,90               | 5,0         | 6,0        | 38         | 3                 |  |
| 154829                             | D6601D-5D.1000                | 1,00               | 5,0         | 6,0        | 38         | 3                 |  |
| 154830                             | D6601D-5D.1100                | 1,10               | 8,0         | 10         | 38         | 3                 |  |
| 154832                             | D6601D-5D.1200                | 1,20               | 8,0         | 10         | 38         | 3                 |  |
| 154833                             | D6601D-5D.1300                | 1,30               | 8,0         | 10         | 38         | 3                 |  |
| 154834                             | D6601D-5D.1400                | 1,40               | 8,0         | 10         | 38         | 3                 |  |
| 154835                             | D6601D-5D.1500                | 1,50               | 8,0         | 10         | 38         | 3                 |  |
| 154837                             | D6601D-5D.1600                | 1,60               | 11          | 14         | 38         | 3                 |  |
| 154838                             | D6601D-5D.1700                | 1,70               | 11          | 14         | 38         | 3                 |  |
| 154839                             | D6601D-5D.1800                | 1,80               | 11          | 14         | 38         | 3                 |  |
| 154840                             | D6601D-5D.1900                | 1,90               | 11          | 14         | 38         | 3                 |  |
| 154841                             | D6601D-5D.2000                | 2,00               | 11          | 14         | 38         | 3                 |  |
| 154842                             | D6601D-5D.2100                | 2,10               | 14          | 18         | 50         | 3                 |  |
| 154843                             | D6601D-5D.2200                | 2,20               | 14          | 18         | 50         | 3                 |  |
| 154844                             | D6601D-5D.2300                | 2,30               | 14          | 18         | 50         | 3                 |  |
| 154846                             | D6601D-5D.2400                | 2,40               | 14          | 18         | 50         | 3                 |  |
| 154848                             | D6601D-5D.2500                | 2,50               | 14          | 18         | 50         | 3                 |  |
| 154849                             | D6601D-5D.2600                | 2,60               | 16          | 20         | 50         | 3                 |  |
| 154850                             | D6601D-5D.2700                | 2,70               | 16          | 20         | 50         | 3                 |  |
| 154851                             | D6601D-5D.2800                | 2,80               | 16          | 20         | 50         | 3                 |  |
| 154852                             | D6601D-5D.2900                | 2,90               | 16          | 20         | 50         | 3                 |  |
| 154853                             | D6601D-5D.3000                | 3,00               | 23          | 28         | 66         | 4                 |  |

Oben aufgeführte Werkzeuge ab Lager lieferbar  
Tools listed above available from stock  
Les outils susmentionnés sont en stock

Zwischenabmessungen kurzfristig lieferbar  
Intermediate dimensions available at short notice  
Dimensions intermédiaires livrables sous court délai



## System/Système DIK2131F TiAlN 8xD

universell einsetzbar

for universal use

utilisable universellement

**VHM Micro-Hochleistungsbohrer mit innerer Kühlmittelzufuhr TiAlN beschichtet**

2 Schneiden  
rechtschneidend

Drallwinkel: 30°  
Spitzenwinkel: 140°

Anschnitt: 4 Flächen

**SC micro drills HPC with internal coolant TiAlN coated**

2 flutes  
right-hand cutting

Helix angle: 30°  
Point angle: 140°

Chamfer: 4 facet pointing

**Micro-foret hélicoïdal HPC en carbure à arrosage central Revêtement: TiAlN**

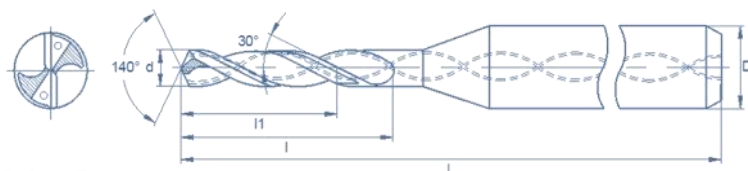
2 dents  
coupe à droite

Angle d'hélice: 30°  
Angle de pointe: 140°

Affûtage: 4 facettes

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. no.<br>Réf. | Ø d<br>m7<br>in mm | l1<br>in mm | l<br>in mm | L<br>in mm | ØD<br>h6<br>in mm |  |
|------------------------------------|-------------------------------|--------------------|-------------|------------|------------|-------------------|--|
| 156921                             | DIK2131F-8D.1000              | 1,00               | 9,0         | 11,0       | 55,0       | 3,0               |  |
| 156923                             | DIK2131F-8D.1100              | 1,10               | 13,5        | 17,0       | 55,0       | 3,0               |  |
| 156924                             | DIK2131F-8D.1200              | 1,20               | 13,5        | 17,0       | 55,0       | 3,0               |  |
| 156925                             | DIK2131F-8D.1300              | 1,30               | 13,5        | 17,0       | 55,0       | 3,0               |  |
| 156926                             | DIK2131F-8D.1400              | 1,40               | 13,5        | 17,0       | 55,0       | 3,0               |  |
| 156927                             | DIK2131F-8D.1500              | 1,50               | 17,5        | 22,0       | 65,0       | 3,0               |  |
| 156928                             | DIK2131F-8D.1600              | 1,60               | 17,5        | 22,0       | 65,0       | 3,0               |  |
| 156929                             | DIK2131F-8D.1700              | 1,70               | 17,5        | 22,0       | 65,0       | 3,0               |  |
| 156930                             | DIK2131F-8D.1800              | 1,80               | 17,5        | 22,0       | 65,0       | 3,0               |  |
| 156931                             | DIK2131F-8D.1900              | 1,90               | 17,5        | 22,0       | 65,0       | 3,0               |  |
| 156932                             | DIK2131F-8D.2000              | 2,00               | 22,5        | 28,0       | 74,0       | 3,0               |  |
| 156933                             | DIK2131F-8D.2100              | 2,10               | 22,5        | 28,0       | 74,0       | 3,0               |  |
| 156934                             | DIK2131F-8D.2200              | 2,20               | 22,5        | 28,0       | 74,0       | 3,0               |  |
| 156935                             | DIK2131F-8D.2300              | 2,30               | 22,5        | 28,0       | 74,0       | 3,0               |  |
| 156936                             | DIK2131F-8D.2400              | 2,40               | 22,5        | 28,0       | 74,0       | 3,0               |  |
| 156937                             | DIK2131F-8D.2500              | 2,50               | 22,5        | 32,0       | 81,0       | 3,0               |  |
| 156939                             | DIK2131F-8D.2600              | 2,60               | 22,5        | 32,0       | 81,0       | 3,0               |  |
| 156940                             | DIK2131F-8D.2700              | 2,70               | 22,5        | 32,0       | 81,0       | 3,0               |  |
| 156941                             | DIK2131F-8D.2800              | 2,80               | 22,5        | 32,0       | 81,0       | 3,0               |  |
| 156942                             | DIK2131F-8D.2900              | 2,90               | 22,5        | 32,0       | 81,0       | 3,0               |  |
| 156943                             | DIK2131F-8D.3000              | 3,00               | 27,0        | 34,0       | 72,0       | 6,0               |  |
|                                    |                               |                    |             |            |            |                   |  |
|                                    |                               |                    |             |            |            |                   |  |
|                                    |                               |                    |             |            |            |                   |  |
|                                    |                               |                    |             |            |            |                   |  |
|                                    |                               |                    |             |            |            |                   |  |
|                                    |                               |                    |             |            |            |                   |  |

Oben aufgeführte Werkzeuge innerhalb 1-2 Wochen lieferbar  
Tools listed above available within 1 to 2 weeks  
Les outils susmentionnés livrables dans 1 à 2 semaines



## System/Système DIK2131F TiAlN 12xD

universell einsetzbar

for universal use

utilisable universellement

**VHM Micro-Hochleistungsbohrer**  
mit innerer Kühlmittelzufuhr  
**TiAlN beschichtet**

2 Schneiden  
rechtschneidend

Drallwinkel: 30°  
Spitzenwinkel: 140°

Anschnitt: 4 Flächen

**SC micro drills HPC**  
with internal coolant  
**TiAlN coated**

2 flutes  
right-hand cutting

Helix angle: 30°  
Point angle: 140°

Chamfer: 4 facet pointing

**Micro-foret hélicoïdal HPC**  
**en carbure**  
à arrosage central  
**Revêtement: TiAlN**

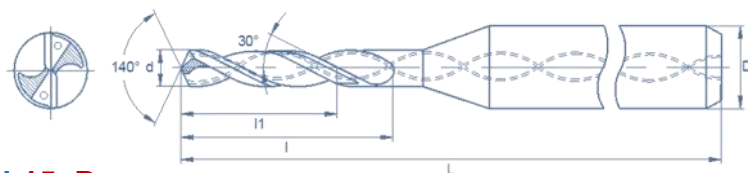
2 dents  
coupe à droite

Angle d'hélice: 30°  
Angle de pointe: 140°

Affûtage: 4 facettes

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. no.<br>Réf. | Ø d<br>m7<br>in mm | l1<br>in mm | l<br>in mm | L<br>in mm | ØD<br>h6<br>in mm |  |
|------------------------------------|-------------------------------|--------------------|-------------|------------|------------|-------------------|--|
| 156944                             | DIK2131F-12D.1000             | 1,00               | 12,0        | 15,0       | 55,0       | 3,0               |  |
| 156945                             | DIK2131F-12D.1100             | 1,10               | 18,5        | 23,0       | 55,0       | 3,0               |  |
| 156946                             | DIK2131F-12D.1200             | 1,20               | 18,5        | 23,0       | 55,0       | 3,0               |  |
| 156947                             | DIK2131F-12D.1300             | 1,30               | 18,5        | 23,0       | 55,0       | 3,0               |  |
| 156948                             | DIK2131F-12D.1400             | 1,40               | 18,5        | 23,0       | 55,0       | 3,0               |  |
| 156949                             | DIK2131F-12D.1500             | 1,50               | 18,5        | 23,0       | 55,0       | 3,0               |  |
| 156950                             | DIK2131F-12D.1600             | 1,60               | 24,0        | 30,0       | 65,0       | 3,0               |  |
| 156951                             | DIK2131F-12D.1700             | 1,70               | 24,0        | 30,0       | 65,0       | 3,0               |  |
| 156952                             | DIK2131F-12D.1800             | 1,80               | 24,0        | 30,0       | 65,0       | 3,0               |  |
| 156953                             | DIK2131F-12D.1900             | 1,90               | 24,0        | 30,0       | 65,0       | 3,0               |  |
| 156954                             | DIK2131F-12D.2000             | 2,00               | 24,0        | 30,0       | 65,0       | 3,0               |  |
| 156955                             | DIK2131F-12D.2100             | 2,10               | 30,5        | 38,0       | 74,0       | 3,0               |  |
| 156956                             | DIK2131F-12D.2200             | 2,20               | 30,5        | 38,0       | 74,0       | 3,0               |  |
| 156957                             | DIK2131F-12D.2300             | 2,30               | 30,5        | 38,0       | 74,0       | 3,0               |  |
| 156958                             | DIK2131F-12D.2400             | 2,40               | 30,5        | 38,0       | 74,0       | 3,0               |  |
| 156959                             | DIK2131F-12D.2500             | 2,50               | 30,5        | 38,0       | 74,0       | 3,0               |  |
| 156960                             | DIK2131F-12D.2600             | 2,60               | 30,5        | 44,0       | 81,0       | 3,0               |  |
| 156961                             | DIK2131F-12D.2700             | 2,70               | 35,0        | 44,0       | 81,0       | 3,0               |  |
| 156962                             | DIK2131F-12D.2800             | 2,80               | 35,0        | 44,0       | 81,0       | 3,0               |  |
| 156963                             | DIK2131F-12D.2900             | 2,90               | 35,0        | 44,0       | 81,0       | 3,0               |  |
| 156964                             | DIK2131F-12D.3000             | 3,00               | 48,0        | 54,0       | 92,0       | 6,0               |  |
|                                    |                               |                    |             |            |            |                   |  |
|                                    |                               |                    |             |            |            |                   |  |
|                                    |                               |                    |             |            |            |                   |  |
|                                    |                               |                    |             |            |            |                   |  |
|                                    |                               |                    |             |            |            |                   |  |
|                                    |                               |                    |             |            |            |                   |  |

Oben aufgeführte Werkzeuge innerhalb 1-2 Wochen lieferbar  
Tools listed above available within 1 to 2 weeks  
Les outils susmentionnés livrables dans 1 à 2 semaines



## System/Système DIK2131F TiAlN 15xD

universell einsetzbar

for universal use

utilisable universellement

**VHM Micro-Hochleistungsbohrer**  
mit innerer Kühlmittelzufuhr  
**TiAlN beschichtet**

2 Schneiden  
rechtschneidend

Drallwinkel: 30°  
Spitzenwinkel: 140°

Anschnitt: 4 Flächen

**SC micro drills HPC**  
with internal coolant  
**TiAlN coated**

2 flutes  
right-hand cutting

Helix angle: 30°  
Point angle: 140°

Chamfer: 4 facet pointing

**Micro-foret hélicoïdal HPC**  
en carbure  
à arrosage central  
**Revêtement: TiAlN**

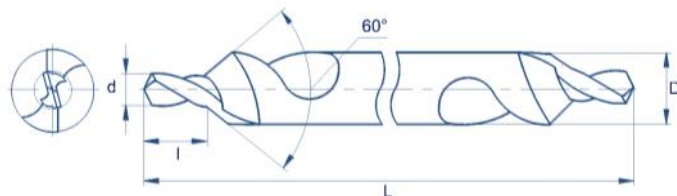
2 dents  
coupe à droite

Angle d'hélice: 30°  
Angle de pointe: 140°

Affûtage: 4 facettes

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. no.<br>Réf. | Ø d<br>m7<br>in mm | l1<br>in mm | l<br>in mm | L<br>in mm | ØD<br>h6<br>in mm |  |
|------------------------------------|-------------------------------|--------------------|-------------|------------|------------|-------------------|--|
| 156965                             | DIK2131F-15D.1000             | 1,00               | 16,0        | 20,0       | 60,0       | 3,0               |  |
| 156966                             | DIK2131F-15D.1100             | 1,10               | 17,6        | 22,0       | 60,0       | 3,0               |  |
| 156967                             | DIK2131F-15D.1200             | 1,20               | 19,2        | 24,0       | 60,0       | 3,0               |  |
| 156968                             | DIK2131F-15D.1300             | 1,30               | 20,0        | 25,0       | 60,0       | 3,0               |  |
| 156969                             | DIK2131F-15D.1400             | 1,40               | 21,6        | 27,0       | 60,0       | 3,0               |  |
| 156970                             | DIK2131F-15D.1500             | 1,50               | 22,5        | 27,0       | 60,0       | 3,0               |  |
| 156971                             | DIK2131F-15D.1600             | 1,60               | 25,6        | 32,0       | 65,0       | 3,0               |  |
| 156972                             | DIK2131F-15D.1700             | 1,70               | 25,6        | 32,0       | 65,0       | 3,0               |  |
| 156974                             | DIK2131F-15D.1800             | 1,80               | 28,0        | 35,0       | 65,0       | 3,0               |  |
| 156975                             | DIK2131F-15D.1900             | 1,90               | 28,5        | 35,0       | 65,0       | 3,0               |  |
| 156976                             | DIK2131F-15D.2000             | 2,00               | 30,0        | 35,0       | 65,0       | 3,0               |  |
| 156977                             | DIK2131F-15D.2100             | 2,10               | 32,0        | 40,0       | 75,0       | 3,0               |  |
| 156978                             | DIK2131F-15D.2200             | 2,20               | 33,0        | 40,0       | 75,0       | 3,0               |  |
| 156979                             | DIK2131F-15D.2300             | 2,30               | 34,0        | 40,0       | 75,0       | 3,0               |  |
| 156980                             | DIK2131F-15D.2400             | 2,40               | 36,0        | 45,0       | 75,0       | 3,0               |  |
| 156981                             | DIK2131F-15D.2500             | 2,50               | 36,8        | 45,0       | 75,0       | 3,0               |  |
| 156982                             | DIK2131F-15D.2600             | 2,60               | 38,6        | 48,0       | 80,0       | 3,0               |  |
| 156983                             | DIK2131F-15D.2700             | 2,70               | 38,6        | 48,0       | 80,0       | 3,0               |  |
| 156984                             | DIK2131F-15D.2800             | 2,80               | 42,0        | 50,0       | 80,0       | 3,0               |  |
| 156985                             | DIK2131F-15D.2900             | 2,90               | 43,0        | 50,0       | 80,0       | 3,0               |  |
| 156986                             | DIK2131F-15D.3000             | 3,00               | 48,0        | 60,0       | 100,0      | 6,0               |  |
|                                    |                               |                    |             |            |            |                   |  |
|                                    |                               |                    |             |            |            |                   |  |
|                                    |                               |                    |             |            |            |                   |  |
|                                    |                               |                    |             |            |            |                   |  |
|                                    |                               |                    |             |            |            |                   |  |
|                                    |                               |                    |             |            |            |                   |  |

Oben aufgeführte Werkzeuge innerhalb 1-2 Wochen lieferbar  
Tools listed above available within 1 to 2 weeks  
Les outils susmentionnés livrables dans 1 à 2 semaines



## System/Système D5701

|                      |                      |                                        |                                        |                                      |                                      |                                    |                       |                        |                         |                 |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|
| <b>ALU</b><br><10%Si | <b>ALU</b><br>>10%Si | <b>STEEL</b><br><1000N/mm <sup>2</sup> | <b>STEEL</b><br>>1000N/mm <sup>2</sup> | <b>INOX</b><br><850N/mm <sup>2</sup> | <b>INOX</b><br>>850N/mm <sup>2</sup> | <b>Ti</b><br>>850N/mm <sup>2</sup> | <b>CAST</b><br>GGG/GG | <b>Cu(Zn)</b><br>Au/Ag | <b>CFRP</b><br>Graphite | <b>Plastics</b> |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

### VHM-Zentrierbohrer nach DIN 333

2 Schneiden  
rechtsschneidend

Drallwinkel: 30°  
doppelseitig: 60°

4-Flächen-Anschnitt  
Form A

### SC centre drills acc. to DIN 333

2 flutes  
right-hand cutting

Helix angle: 30°  
double-sided: 60°

4-surface grinding  
profile A

### Foret à centrer en carbure dimensions selon DIN 333

2 dents  
coupe à droite

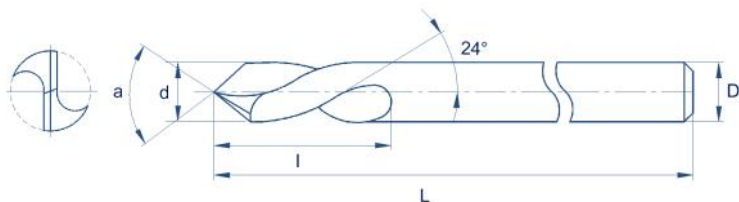
Angle d'hélice: 30°  
60° sur les deux cotés

Affûtage sur 4 surfaces  
forme A

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Order Nr.<br>Réf. | Ø d<br>in<br>mm | l<br>in mm  | L<br>in<br>mm | ØD<br>in mm |   |
|------------------------------------|--------------------------------|-----------------|-------------|---------------|-------------|---|
| 154977                             | D5701-D0.50-D3.15              | 0,50            | 0,60 - 0,90 | 25            | 3,15        |   |
| 154978                             | D5701-D0.80-D3.15              | 0,80            | 1,00 - 1,30 | 25            | 3,15        |   |
| 154979                             | D5701-D1.00-D3.15              | 1,00            | 1,30 - 1,70 | 31,5          | 3,15        |   |
| 154980                             | D5701-D1.00-D4.00              | 1,00            | 1,30 - 1,70 | 35,5          | 4,00        | ♦ |
| 154981                             | D5701-D1.25-D3.15              | 1,25            | 1,60 - 2,00 | 31,5          | 3,15        |   |
| 154982                             | D5701-D1.50-D5.00              | 1,50            | 2,00 - 2,60 | 40            | 5,00        | ♦ |
| 154983                             | D5701-D1.60-D4.00              | 1,60            | 2,00 - 2,60 | 35,5          | 4,00        |   |
| 154984                             | D5701-D2.00-D5.00              | 2,00            | 2,50 - 3,10 | 40            | 5,00        |   |
| 154985                             | D5701-D2.00-D6.00              | 2,00            | 2,50 - 3,10 | 45            | 6,00        | ♦ |
| 154986                             | D5701-D2.50-D6.30              | 2,50            | 3,10 - 3,80 | 45            | 6,30        |   |
| 154987                             | D5701-D2.50-D8.00              | 2,50            | 3,10 - 3,80 | 50            | 8,00        | ♦ |
| 154988                             | D5701-D3.00-D8.00              | 3,00            | 3,90 - 4,60 | 50            | 8,00        | ♦ |
| 154989                             | D5701-D3.00-D10.00             | 3,00            | 3,90 - 4,60 | 55            | 10,00       | ♦ |
| 154990                             | D5701-D3.15-D8.00              | 3,15            | 3,90 - 4,60 | 50            | 8,00        |   |
| 154991                             | D5701-D4.00-D10.00             | 4,00            | 5,00 - 5,90 | 56            | 10,00       |   |
| 154992                             | D5701-D5.00-D12.00             | 5,00            | 6,30 - 7,20 | 63            | 12,00       | ♦ |
| 154993                             | D5701-D5.00-D12.50             | 5,00            | 6,30 - 7,20 | 63            | 12,50       |   |
| 154994                             | D5701-D6.30-D16.00             | 6,30            | 8,00 - 8,90 | 71            | 16,00       |   |
|                                    |                                |                 |             |               |             |   |
|                                    |                                |                 |             |               |             |   |

Oben aufgeführte Werkzeuge ab Lager lieferbar  
Tools listed above available from stock  
Les outils susmentionnés sont en stock

Zwischenabmessungen kurzfristig lieferbar  
Intermediate dimensions available at short notice  
Dimensions intermédiaires livrables sous court délai



## System/Système D4911 90°

|                           |                           |                                             |                                             |                                           |                                           |                                         |                            |                             |                              |                      |
|---------------------------|---------------------------|---------------------------------------------|---------------------------------------------|-------------------------------------------|-------------------------------------------|-----------------------------------------|----------------------------|-----------------------------|------------------------------|----------------------|
| <b>ALU</b><br><10%Si<br>● | <b>ALU</b><br>>10%Si<br>● | <b>STEEL</b><br><1000N/mm <sup>2</sup><br>● | <b>STEEL</b><br>>1000N/mm <sup>2</sup><br>● | <b>INOX</b><br><850N/mm <sup>2</sup><br>● | <b>INOX</b><br>>850N/mm <sup>2</sup><br>● | <b>Ti</b><br>>850N/mm <sup>2</sup><br>● | <b>CAST</b><br>GGG/GG<br>● | <b>Cu(Zn)</b><br>Au/Ag<br>● | <b>CFRP</b><br>Graphite<br>● | <b>Plastics</b><br>● |
|---------------------------|---------------------------|---------------------------------------------|---------------------------------------------|-------------------------------------------|-------------------------------------------|-----------------------------------------|----------------------------|-----------------------------|------------------------------|----------------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

### VHM-NC-Anbohrer

2 Schneiden  
rechtsschneidend

Drallwinkel: 24°  
Spitzenwinkel: 90°

4-Flächen-Anschnitt

### SC NC spotting drill

2 flutes  
right-hand cutting

Helix angle: 24°  
Point angle: 90°

4-surface grinding

### Foret à pointer en carbure

2 dents  
coupe à droite

Angle d'hélice: 24°

Angle de pointe: 90°

Affûtage sur 4 surfaces

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. no.<br>Réf. | Ø d<br>in mm | l<br>in mm | L<br>in mm | ØD<br>in mm |  |
|------------------------------------|-------------------------------|--------------|------------|------------|-------------|--|
| 155032                             | D4911.020                     | 2            | 8          | 40         | 2           |  |
| 155033                             | D4911.030                     | 3            | 12         | 50         | 3           |  |
| 155034                             | D4911.040                     | 4            | 14         | 50         | 4           |  |
| 155035                             | D4911.050                     | 5            | 16         | 60         | 5           |  |
| 155036                             | D4911.060                     | 6            | 16         | 60         | 6           |  |
| 155037                             | D4911.080                     | 8            | 25         | 60         | 8           |  |
| 155038                             | D4911.100                     | 10           | 27         | 70         | 10          |  |
|                                    |                               |              |            |            |             |  |
|                                    |                               |              |            |            |             |  |
|                                    |                               |              |            |            |             |  |

⇒ linksschneidend auf Anfrage

⇒ left-hand cutting on request

⇒ coupe à gauche sur demande

Oben aufgeführte Werkzeuge ab Lager lieferbar

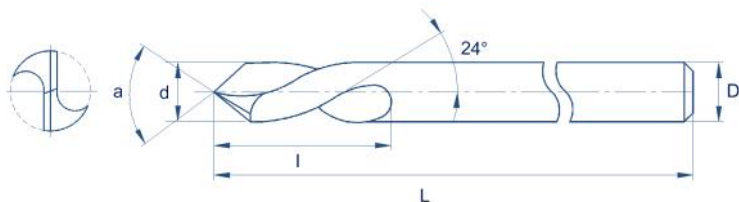
Tools listed above available from stock

Les outils susmentionnés sont en stock

Zwischenabmessungen kurzfristig lieferbar

Intermediate dimensions available at short notice

Dimensions intermédiaires livrables sous court délai



## System/Système D4921 120°

|                           |                           |                                 |                                 |                               |                               |                             |                            |                             |                              |                      |
|---------------------------|---------------------------|---------------------------------|---------------------------------|-------------------------------|-------------------------------|-----------------------------|----------------------------|-----------------------------|------------------------------|----------------------|
| <b>ALU</b><br><10%Si<br>● | <b>ALU</b><br>>10%Si<br>● | <b>STEEL</b><br><1000N/mm²<br>● | <b>STEEL</b><br>>1000N/mm²<br>● | <b>INOX</b><br><850N/mm²<br>● | <b>INOX</b><br>>850N/mm²<br>● | <b>Ti</b><br>>850N/mm²<br>● | <b>CAST</b><br>GGG/GG<br>● | <b>Cu(Zn)</b><br>Au/Ag<br>● | <b>CFRP</b><br>Graphite<br>● | <b>Plastics</b><br>● |
|---------------------------|---------------------------|---------------------------------|---------------------------------|-------------------------------|-------------------------------|-----------------------------|----------------------------|-----------------------------|------------------------------|----------------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

### VHM-NC-Anbohrer

2 Schneiden  
rechtsschneidend

Drallwinkel: 24°  
Spitzenwinkel: 120°

4-Flächen-Anschnitt

### SC NC spotting drill

2 flutes  
right-hand cutting

Helix angle: 24°  
Point angle: 120°

4-surface grinding

### Foret à pointer en carbure

2 dents  
coupe à droite

Angle d'hélice: 24°

Angle de pointe: 120°

Affûtage sur 4 surfaces

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. No.<br>Réf. | Ø d<br>in mm | l<br>in mm | L<br>in mm | ØD<br>in mm |  |
|------------------------------------|-------------------------------|--------------|------------|------------|-------------|--|
| 155039                             | D4921.020                     | 2            | 8          | 40         | 2           |  |
| 155040                             | D4921.030                     | 3            | 12         | 50         | 3           |  |
| 155041                             | D4921.040                     | 4            | 14         | 50         | 4           |  |
| 155042                             | D4921.050                     | 5            | 16         | 60         | 5           |  |
| 155043                             | D4921.060                     | 6            | 16         | 60         | 6           |  |
| 155044                             | D4921.080                     | 8            | 25         | 60         | 8           |  |
| 155045                             | D4921.100                     | 10           | 27         | 70         | 10          |  |
|                                    |                               |              |            |            |             |  |
|                                    |                               |              |            |            |             |  |
|                                    |                               |              |            |            |             |  |

⇒ linksschneidend auf Anfrage

⇒ left-hand cutting on request

⇒ coupe à gauche sur demande

Oben aufgeführte Werkzeuge ab Lager lieferbar

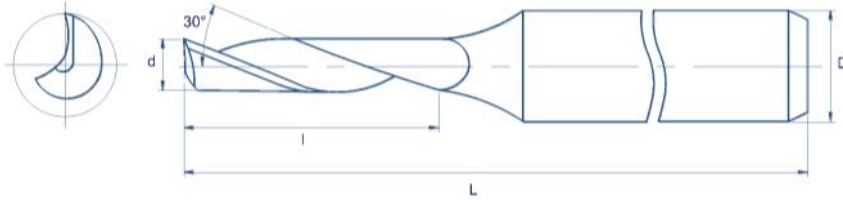
Tools listed above available from stock

Les outils susmentionnés sont en stock

Zwischenabmessungen kurzfristig lieferbar

Intermediate dimensions available at short notice

Dimensions intermédiaires livrables sous court délai



## System/Système M8231

|                      |                      |                                        |                                        |                                      |                                      |                                    |                       |                        |                         |                 |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|
| <b>ALU</b><br><10%Si | <b>ALU</b><br>>10%Si | <b>STEEL</b><br><1000N/mm <sup>2</sup> | <b>STEEL</b><br>>1000N/mm <sup>2</sup> | <b>INOX</b><br><850N/mm <sup>2</sup> | <b>INOX</b><br>>850N/mm <sup>2</sup> | <b>Ti</b><br>>850N/mm <sup>2</sup> | <b>CAST</b><br>GGG/GG | <b>Cu(Zn)</b><br>Au/Ag | <b>CFRP</b><br>Graphite | <b>Plastics</b> |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

### VHM Einschneidenfräser (RH/RC) mit polierter Schneide

1 Schneide  
rechtsschneidend, ziehend

Drallwinkel: 30°

Für Aluminium, weiche NE-Metalle und Kunststoffe

### Solid carbide single flute end mill (RH/RC) with polished flute

1 flute  
right-hand cutting, up-cut

Helix angle: 30°

For aluminium, soft non-ferrous materials and plastics

### Fraise à une lèvre en carbure (RH/RC) avec coupe polie

1 dent  
coupe à droite, cisailage  
oblique

Angle d'hélice: 30°

Pour aluminium, matériaux  
non-ferreux et plastiques

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. no.<br>Réf. | Ø d<br>in mm | l<br>in mm | L<br>in mm | ØD<br>h6<br>in mm |  |
|------------------------------------|-------------------------------|--------------|------------|------------|-------------------|--|
| 155046                             | M8231P.0100.050.038.03        | 1            | 5          | 38         | 3                 |  |
| 155053                             | M8231P.0150.050.038.03        | 1,5          | 5          | 38         | 3                 |  |
| 155056                             | M8231P.0200.060.038.03        | 2            | 6          | 38         | 3                 |  |
| 155057                             | M8231P.0200.060.050.06        | 2            | 6          | 50         | 6                 |  |
| 155058                             | M8231P.0200.100.038.03        | 2            | 10         | 38         | 3                 |  |
| 155061                             | M8231P.0200.110.038.03        | 2            | 11         | 38         | 3                 |  |
| 155062                             | M8231P.0300.100.038.03        | 3            | 10         | 38         | 3                 |  |
| 155063                             | M8231P.0300.110.038.03        | 3            | 11         | 38         | 3                 |  |
| 155064                             | M8231P.0300.110.050.06        | 3            | 11         | 50         | 6                 |  |
| 155065                             | M8231P.0300.220.060.06        | 3            | 22         | 60         | 6                 |  |
| 155066                             | M8231P.0400.140.050.04        | 4            | 14         | 50         | 4                 |  |
| 155067                             | M8231P.0400.140.050.06        | 4            | 14         | 50         | 6                 |  |
| 155068                             | M8231P.0500.160.060.06        | 5            | 16         | 60         | 6                 |  |
| 155069                             | M8231P.0600.200.060.06        | 6            | 20         | 60         | 6                 |  |
| 155070                             | M8231P.0600.220.050.06        | 6            | 22         | 50         | 6                 |  |
| 155071                             | M8231P.0600.320.064.06        | 6            | 32         | 64         | 6                 |  |
| 155072                             | M8231P.0800.200.075.08        | 8            | 20         | 75         | 8                 |  |
| 155074                             | M8231P.0800.320.064.08        | 8            | 32         | 64         | 8                 |  |
| 155075                             | M8231P.1000.220.064.10        | 10           | 22         | 64         | 10                |  |
| 155076                             | M8231P.1200.220.064.12        | 12           | 22         | 64         | 12                |  |
|                                    |                               |              |            |            |                   |  |
|                                    |                               |              |            |            |                   |  |
|                                    |                               |              |            |            |                   |  |

Oben aufgeführte Werkzeuge ab Lager lieferbar

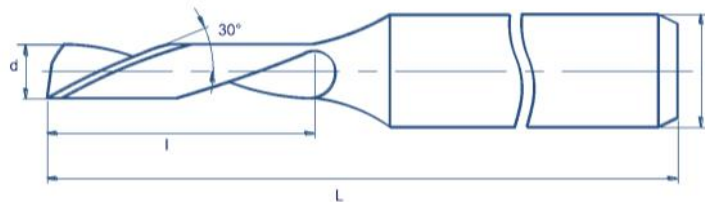
Tools listed above available from stock

Les outils susmentionnés sont en stock

Zwischenabmessungen kurzfristig lieferbar

Intermediate dimensions available at short notice

Dimensions intermédiaires livrables sous court délai



## System/Système M8211

|                      |                      |                                        |                                        |                                      |                                      |                                    |                       |                        |                         |                 |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|
| <b>ALU</b><br><10%Si | <b>ALU</b><br>>10%Si | <b>STEEL</b><br><1000N/mm <sup>2</sup> | <b>STEEL</b><br>>1000N/mm <sup>2</sup> | <b>INOX</b><br><850N/mm <sup>2</sup> | <b>INOX</b><br>>850N/mm <sup>2</sup> | <b>Ti</b><br>>850N/mm <sup>2</sup> | <b>CAST</b><br>GGG/GG | <b>Cu(Zn)</b><br>Au/Ag | <b>CFRP</b><br>Graphite | <b>Plastics</b> |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

### VHM Einschneidenfräser (LH/RC) mit polierter Schneide

1 Schneide  
rechtsschneidend, schiebend

Drallwinkel: 30°

Für Aluminium, weiche NE-Metalle und Kunststoffe

### Solid carbide single flute end mill (LH/RC) with polished flute

1 flute  
right-hand cutting, down-cut

Helix angle: 30°

For aluminium, soft non-ferrous materials and plastics

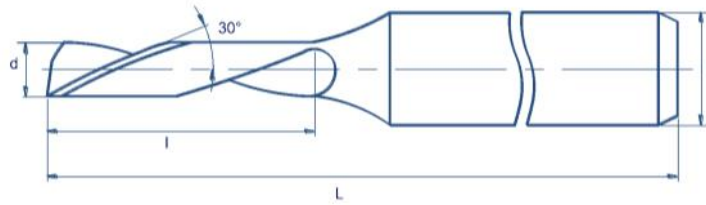
### Fraise à une lèvre en carbure (LH/RC) avec coupe polie

1 dent  
coupe à droite, par coulissement

Angle d'hélice: 30°

Pour aluminium, matériaux non-ferreux et plastiques

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Order Nr.<br>Réf. | Ø d<br>in mm | l<br>in mm | L<br>in mm | ØD<br>h6<br>in mm |  |
|------------------------------------|--------------------------------|--------------|------------|------------|-------------------|--|
| 155079                             | M8211P.0100.040.040.03         | 1            | 4          | 40         | 3                 |  |
| 155080                             | M8211P.0150.060.040.03         | 1,5          | 6          | 40         | 3                 |  |
| 155081                             | M8211P.0200.030.050.03         | 2            | 3          | 50         | 3                 |  |
| 155082                             | M8211P.0200.060.050.06         | 2            | 6          | 50         | 6                 |  |
| 155083                             | M8211P.0200.080.040.03         | 2            | 8          | 40         | 3                 |  |
| 155084                             | M8211P.0300.040.050.03         | 3            | 4          | 50         | 3                 |  |
| 155085                             | M8211P.0300.060.050.03         | 3            | 6          | 50         | 3                 |  |
| 155086                             | M8211P.0300.100.030.03         | 3            | 10         | 30         | 3                 |  |
| 155087                             | M8211P.0300.100.060.03         | 3            | 10         | 60         | 3                 |  |
| 155088                             | M8211P.0300.120.050.06         | 3            | 12         | 50         | 6                 |  |
| 155090                             | M8211P.0300.150.075.08         | 3            | 15         | 75         | 8                 |  |
| 155091                             | M8211P.0300.180.100.08         | 3            | 18         | 100        | 8                 |  |
| 155092                             | M8211P.0400.050.050.04         | 4            | 5          | 50         | 4                 |  |
| 155093                             | M8211P.0400.080.040.04         | 4            | 8          | 40         | 4                 |  |
| 155094                             | M8211P.0400.140.050.06         | 4            | 14         | 50         | 6                 |  |
| 155095                             | M8211P.0400.180.075.08         | 4            | 18         | 75         | 8                 |  |
| 155096                             | M8211P.0400.200.060.04         | 4            | 20         | 60         | 4                 |  |
| 155097                             | M8211P.0400.220.100.08         | 4            | 22         | 100        | 8                 |  |
| 155098                             | M8211P.0500.060.050.06         | 5            | 6          | 50         | 6                 |  |
| 155099                             | M8211P.0500.100.040.06         | 5            | 10         | 40         | 6                 |  |
| 155100                             | M8211P.0500.160.050.06         | 5            | 16         | 50         | 6                 |  |
| 155101                             | M8211P.0500.220.060.06         | 5            | 22         | 60         | 6                 |  |
| 155102                             | M8211P.0500.250.075.08         | 5            | 25         | 75         | 8                 |  |
| 155103                             | M8211P.0500.250.100.08         | 5            | 25         | 100        | 8                 |  |
| 155104                             | M8211P.0500.300.070.06         | 5            | 30         | 70         | 6                 |  |
| 155105                             | M8211P.0600.070.050.06         | 6            | 7          | 50         | 6                 |  |
| 155106                             | M8211P.0600.180.050.06         | 6            | 18         | 50         | 6                 |  |
| 155107                             | M8211P.0600.200.060.06         | 6            | 20         | 60         | 6                 |  |
| 155108                             | M8211P.0600.250.065.06         | 6            | 25         | 65         | 6                 |  |



## System/Système M8211

|                           |                           |                                             |                                             |                                           |                                           |                                         |                            |                             |                              |                      |
|---------------------------|---------------------------|---------------------------------------------|---------------------------------------------|-------------------------------------------|-------------------------------------------|-----------------------------------------|----------------------------|-----------------------------|------------------------------|----------------------|
| <b>ALU</b><br><10%Si<br>● | <b>ALU</b><br>>10%Si<br>● | <b>STEEL</b><br><1000N/mm <sup>2</sup><br>● | <b>STEEL</b><br>>1000N/mm <sup>2</sup><br>● | <b>INOX</b><br><850N/mm <sup>2</sup><br>● | <b>INOX</b><br>>850N/mm <sup>2</sup><br>● | <b>Ti</b><br>>850N/mm <sup>2</sup><br>● | <b>CAST</b><br>GGG/GG<br>● | <b>Cu(Zn)</b><br>Au/Ag<br>● | <b>CFRP</b><br>Graphite<br>● | <b>Plastics</b><br>● |
|---------------------------|---------------------------|---------------------------------------------|---------------------------------------------|-------------------------------------------|-------------------------------------------|-----------------------------------------|----------------------------|-----------------------------|------------------------------|----------------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

### VHM

**Einschneidenfräser  
(LH/RC)  
mit polierter Schneide**

1 Schneide  
rechtsschneidend, schiebend

Drallwinkel: 30°

Für Aluminium, weiche NE-  
Metalle und Kunststoffe

**Solid carbide  
single flute end mill  
(LH/RC)  
with polished flute**

1 flute  
right-hand cutting, down-cut

Helix angle: 30°

For aluminium, soft non-  
ferrous materials and plastics

**Fraise à une lèvre  
en carbure  
(LH/RC)  
avec coupe polie**

1 dent  
coupe à droite, par poussée

Angle d'hélice: 30°

Pour aluminium, matériaux  
non-ferreux et plastiques

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. no.<br>Réf. | Ø d<br>in mm | l<br>in mm | L<br>in mm | ØD<br>h6<br>in mm |  |
|------------------------------------|-------------------------------|--------------|------------|------------|-------------------|--|
| 155109                             | M8211P.0600.250.075.08        | 6            | 25         | 75         | 8                 |  |
| 155110                             | M8211P.0600.300.100.08        | 6            | 30         | 100        | 8                 |  |
| 155111                             | M8211P.0600.400.080.06        | 6            | 40         | 80         | 6                 |  |
| 155112                             | M8211P.0800.100.050.08        | 8            | 10         | 50         | 8                 |  |
| 155114                             | M8211P.0800.200.050.08        | 8            | 20         | 50         | 8                 |  |
| 155115                             | M8211P.0800.200.060.08        | 8            | 20         | 60         | 8                 |  |
| 155116                             | M8211P.0800.350.100.08        | 8            | 35         | 100        | 8                 |  |
| 155117                             | M8211P.1000.250.070.10        | 10           | 25         | 70         | 10                |  |
| 155118                             | M8211P.1000.350.090.10        | 10           | 35         | 90         | 10                |  |
| 155119                             | M8211P.1200.300.075.12        | 12           | 30         | 75         | 12                |  |
|                                    |                               |              |            |            |                   |  |
|                                    |                               |              |            |            |                   |  |
|                                    |                               |              |            |            |                   |  |

Oben aufgeführte Werkzeuge ab Lager lieferbar  
Tools listed above available from stock  
Les outils susmentionnés sont en stock

Zwischenabmessungen kurzfristig lieferbar  
Intermediate dimensions available at short notice  
Dimensions intermédiaires livrables sous court délai

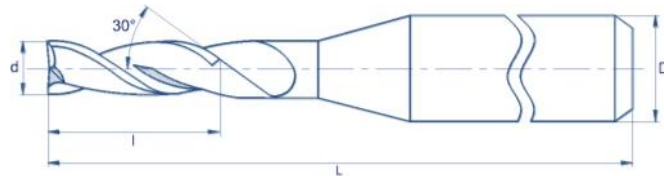


# System/Système M9661

(0,1 - 3,0 mm)



(&gt; 3,0 mm)


**ALU**

&lt;10%Si

**ALU**

&gt;10%Si

**STEEL**

<1000N/mm<sup>2</sup>
**STEEL**

>1000N/mm<sup>2</sup>
**INOX**

<850N/mm<sup>2</sup>
**INOX**

>850N/mm<sup>2</sup>
**Ti**

>850N/mm<sup>2</sup>
**CAST**

GGG/GG

**Cu(Zn)**

Au/Ag

**CFRP**

Graphite

**Plastics**

- optimal geeignet / first choice / premier choix

- geeignet / suitable / approprié

- nicht geeignet / suitable / pas approprié

## VHM- Mikro-Schaftfräser (RH/RC)

2 Schneiden  
rechtsschneidend, ziehend

Drallwinkel: 30°

## Solid carbide micro end mill (RH/RC)

2 flutes  
right-hand cutting, up-cut

Helix angle: 30°

## Mini fraise en carbure (RH/RC)

2 dents  
coupe à droite, par cisailage  
oblique

Angle d'hélice: 30°

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. no.<br>Réf. | Ø d<br>in mm | l<br>in mm | L<br>in mm | ØD<br>h6<br>in mm |  |
|------------------------------------|-------------------------------|--------------|------------|------------|-------------------|--|
| 155120                             | M9661.0010.002.038.03         | 0,1          | 0,2        | 38         | 3                 |  |
| 155121                             | M9661.0020.004.038.03         | 0,2          | 0,4        | 38         | 3                 |  |
| 155122                             | M9661.0020.006.038.03         | 0,2          | 0,6        | 38         | 3                 |  |
| 155123                             | M9661.0030.009.038.03         | 0,3          | 0,9        | 38         | 3                 |  |
| 155124                             | M9661.0040.012.038.03         | 0,4          | 1,2        | 38         | 3                 |  |
| 155125                             | M9661.0050.005.038.03         | 0,5          | 0,5        | 38         | 3                 |  |
| 155126                             | M9661.0050.010.038.03         | 0,5          | 1,0        | 38         | 3                 |  |
| 155127                             | M9661.0050.015.038.03         | 0,5          | 1,5        | 38         | 3                 |  |
| 155128                             | M9661.0060.020.038.03         | 0,6          | 2,0        | 38         | 3                 |  |
| 155130                             | M9661.0070.007.038.03         | 0,7          | 0,7        | 38         | 3                 |  |
| 155131                             | M9661.0070.030.038.03         | 0,7          | 3,0        | 38         | 3                 |  |
| 155132                             | M9661.0080.016.038.03         | 0,8          | 1,6        | 38         | 3                 |  |
| 155133                             | M9661.0080.024.038.03         | 0,8          | 2,4        | 38         | 3                 |  |
| 155134                             | M9661.0080.030.038.03         | 0,8          | 3,0        | 38         | 3                 |  |
| 155135                             | M9661.0090.027.038.03         | 0,9          | 2,7        | 38         | 3                 |  |
| 155136                             | M9661.0100.010.038.03         | 1,0          | 1,0        | 38         | 3                 |  |
| 155137                             | M9661.0100.020.038.03         | 1,0          | 2,0        | 38         | 3                 |  |
| 155138                             | M9661.0100.030.038.03         | 1,0          | 3,0        | 38         | 3                 |  |
| 155139                             | M9661.0120.036.038.03         | 1,2          | 3,6        | 38         | 3                 |  |
| 155141                             | M9661.0150.045.038.03         | 1,5          | 4,5        | 38         | 3                 |  |
| 155142                             | M9661.0160.048.038.03         | 1,6          | 4,8        | 38         | 3                 |  |
| 155143                             | M9661.0180.054.038.03         | 1,8          | 5,4        | 38         | 3                 |  |
| 155150                             | M9661.0200.020.038.03         | 2,0          | 2,0        | 38         | 3                 |  |
| 155170                             | M9661.0200.040.038.03         | 2,0          | 4,0        | 38         | 3                 |  |
| 155171                             | M9661.0200.060.038.03         | 2,0          | 6,0        | 38         | 3                 |  |
| 155172                             | M9661.0200.070.050.06         | 2,0          | 7,0        | 50         | 6                 |  |
| 155173                             | M9661.0200.090.038.03         | 2,0          | 5,0        | 38         | 3                 |  |
| 155174                             | M9661.0250.075.038.03         | 2,5          | 7,5        | 38         | 3                 |  |
| 155175                             | M9661.0300.070.050.06         | 3,0          | 7,0        | 50         | 6                 |  |
|                                    |                               |              |            |            |                   |  |

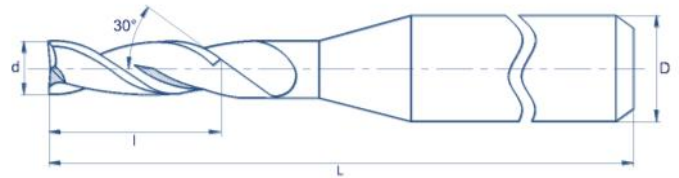


# System/Système M9661

(0,1 - 3,0 mm)



(&gt; 3,0 mm)


**ALU**

&lt;10%Si

**ALU**

&gt;10%Si

**STEEL**

<1000N/mm<sup>2</sup>
**STEEL**

>1000N/mm<sup>2</sup>
**INOX**

<850N/mm<sup>2</sup>
**INOX**

>850N/mm<sup>2</sup>
**Ti**

>850N/mm<sup>2</sup>
**CAST**

GGG/GG

**Cu(Zn)**

Au/Ag

**CFRP**

Graphite

**Plastics**

- optimal geeignet / first choice / premier choix

- geeignet / suitable / approprié

- nicht geeignet / suitable / pas approprié

## VHM

### Mikro-Schaftfräser (RH/RC)

2 Schneiden  
rechtsschneidend, ziehend

Drallwinkel: 30°

### Solid carbide micro end mill (RH/RC)

2 flutes  
right-hand cutting, up-cut

Helix angle: 30°

### Mini fraise en carbure (RH/RC)

2 dents  
coupe à droite, par cisailage  
oblique

Angle d'hélice: 30°

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. no.<br>Réf. | Ø d<br>in mm | l<br>in mm | L<br>in mm | ØD<br>h6<br>in mm |  |
|------------------------------------|-------------------------------|--------------|------------|------------|-------------------|--|
| 155177                             | M9661.0300.090.038.03         | 3,0          | 9,0        | 38         | 3                 |  |
| 155179                             | M9661.0300.120.038.03         | 3,0          | 12,0       | 38         | 3                 |  |
| 155180                             | M9661.0400.080.050.06         | 4,0          | 8,0        | 50         | 6                 |  |
| 155181                             | M9661.0400.120.050.04         | 4,0          | 12,0       | 50         | 4                 |  |
| 155182                             | M9661.0500.100.050.06         | 5,0          | 10,0       | 50         | 6                 |  |
| 155183                             | M9661.0500.150.050.06         | 5,0          | 15,0       | 50         | 6                 |  |
| 155184                             | M9661.0600.120.050.06         | 6,0          | 12,0       | 50         | 6                 |  |
| 155186                             | M9661.0600.180.060.06         | 6,0          | 18,0       | 60         | 6                 |  |
|                                    |                               |              |            |            |                   |  |
|                                    |                               |              |            |            |                   |  |
|                                    |                               |              |            |            |                   |  |

Oben aufgeführte Werkzeuge ab Lager lieferbar

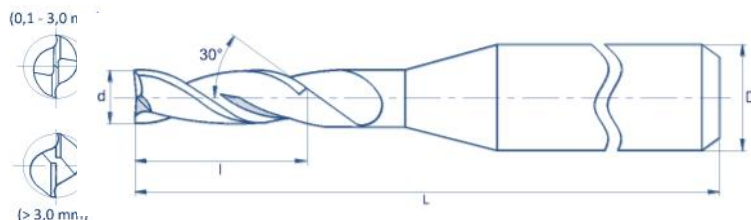
Tools listed above available from stock

Les outils susmentionnés sont en stock

Zwischenabmessungen kurzfristig lieferbar

Intermediate dimensions available at short notice

Dimensions intermédiaires livrables sous court délai



# System/Système M9661F

|                      |                      |                                        |                                        |                                      |                                      |                                    |                       |                        |                         |                 |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|
| <b>ALU</b><br><10%Si | <b>ALU</b><br>>10%Si | <b>STEEL</b><br><1000N/mm <sup>2</sup> | <b>STEEL</b><br>>1000N/mm <sup>2</sup> | <b>INOX</b><br><850N/mm <sup>2</sup> | <b>INOX</b><br>>850N/mm <sup>2</sup> | <b>Ti</b><br>>850N/mm <sup>2</sup> | <b>CAST</b><br>GGG/GG | <b>Cu(Zn)</b><br>Au/Ag | <b>CFRP</b><br>Graphite | <b>Plastics</b> |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

## VHM- Mikro-Schaftfräser (RH/RC)

**TiAIN beschichtet  
für HSC Bearbeitung**

2 Schneiden  
rechtsschneidend, ziehend

Drallwinkel: 30°

## Solid carbide micro end mill (RH/RC)

**TiAIN coated  
for HSC machining**

2 flutes  
right-hand cutting, up-cut

Helix angle: 30°

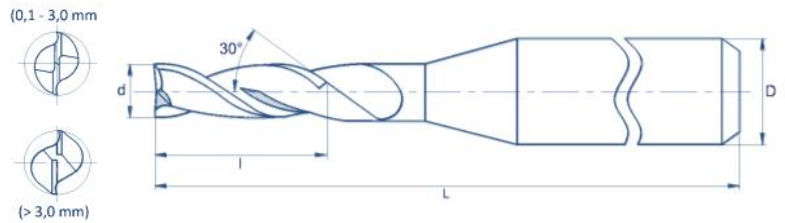
## Mini fraise en carbure (RH/RC)

**Revêtement: TiAIN  
pour l'usinage HSC**

2 dents  
coupe à droite, par cisailage  
oblique

Angle d'hélice: 30°

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. no.<br>Réf. | Ø d<br>in mm | L<br>in mm | L<br>in mm | ØD<br>h6<br>in mm |  |
|------------------------------------|-------------------------------|--------------|------------|------------|-------------------|--|
| 155187                             | M9661F.0010.002.038.03        | 0,1          | 0,2        | 38         | 3                 |  |
| 155188                             | M9661F.0020.004.038.03        | 0,2          | 0,4        | 38         | 3                 |  |
| 155189                             | M9661F.0020.006.038.03        | 0,2          | 0,6        | 38         | 3                 |  |
| 155191                             | M9661F.0030.006.038.03        | 0,3          | 0,6        | 38         | 3                 |  |
| 155192                             | M9661F.0030.009.038.03        | 0,3          | 0,9        | 38         | 3                 |  |
| 155193                             | M9661F.0040.012.038.03        | 0,4          | 1,2        | 38         | 3                 |  |
| 155194                             | M9661F.0050.005.038.03        | 0,5          | 0,5        | 38         | 3                 |  |
| 155195                             | M9661F.0050.010.038.03        | 0,5          | 1,0        | 38         | 3                 |  |
| 155196                             | M9661F.0050.015.038.03        | 0,5          | 1,5        | 38         | 3                 |  |
| 155197                             | M9661F.0060.020.038.03        | 0,6          | 2,0        | 38         | 3                 |  |
| 155198                             | M9661F.0070.007.038.03        | 0,7          | 0,7        | 38         | 3                 |  |
| 155199                             | M9661F.0070.030.038.03        | 0,7          | 3,0        | 38         | 3                 |  |
| 155201                             | M9661F.0080.016.038.03        | 0,8          | 1,6        | 38         | 3                 |  |
| 155203                             | M9661F.0080.024.038.03        | 0,8          | 2,4        | 38         | 3                 |  |
| 155204                             | M9661F.0080.030.038.03        | 0,8          | 3,0        | 38         | 3                 |  |
| 155206                             | M9661F.0090.027.038.03        | 0,9          | 2,7        | 38         | 3                 |  |
| 155207                             | M9661F.0100.010.038.03        | 1,0          | 1,0        | 38         | 3                 |  |
| 155208                             | M9661F.0100.020.038.03        | 1,0          | 2,0        | 38         | 3                 |  |
| 155210                             | M9661F.0100.030.038.03        | 1,0          | 3,0        | 38         | 3                 |  |
| 155211                             | M9661F.0120.036.038.03        | 1,2          | 3,6        | 38         | 3                 |  |
| 155212                             | M9661F.0150.045.038.03        | 1,5          | 4,5        | 38         | 3                 |  |
| 155213                             | M9661F.0160.048.038.03        | 1,6          | 4,8        | 38         | 3                 |  |
| 155214                             | M9661F.0180.054.038.03        | 1,8          | 5,4        | 38         | 3                 |  |
| 155215                             | M9661F.0200.020.038.03        | 2,0          | 2,0        | 38         | 3                 |  |
| 155216                             | M9661F.0200.040.038.03        | 2,0          | 4,0        | 38         | 3                 |  |
| 155217                             | M9661F.0200.060.038.03        | 2,0          | 6,0        | 38         | 3                 |  |
| 155218                             | M9661F.0200.070.050.06        | 2,0          | 7,0        | 50         | 6                 |  |
| 155219                             | M9661F.0200.090.038.03        | 2,0          | 9,0        | 38         | 3                 |  |
| 155221                             | M9661F.0250.075.038.03        | 2,5          | 7,5        | 38         | 3                 |  |
| 155222                             | M9661F.0300.070.050.06        | 3,0          | 7,0        | 50         | 6                 |  |



# System/Système M9661F

|                      |                      |                                        |                                        |                                      |                                      |                                    |                       |                        |                         |                 |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|
| <b>ALU</b><br><10%Si | <b>ALU</b><br>>10%Si | <b>STEEL</b><br><1000N/mm <sup>2</sup> | <b>STEEL</b><br>>1000N/mm <sup>2</sup> | <b>INOX</b><br><850N/mm <sup>2</sup> | <b>INOX</b><br>>850N/mm <sup>2</sup> | <b>Ti</b><br>>850N/mm <sup>2</sup> | <b>CAST</b><br>GGG/GG | <b>Cu(Zn)</b><br>Au/Ag | <b>CFRP</b><br>Graphite | <b>Plastics</b> |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

## VHM- Mikro-Schaftfräser (RH/RC)

**TiAlN beschichtet  
für HSC Bearbeitung**

2 Schneiden  
rechtsschneidend, ziehend

Drallwinkel: 30°

## Solid carbide micro end mill (RH/RC)

**TiAlN coated  
for HSC machining**

2 flutes  
right-hand cutting, up-cut

Helix angle: 30°

## Mini fraise en carbure (RH/RC)

**Revêtement: TiAlN  
pour l'usinage HSC**

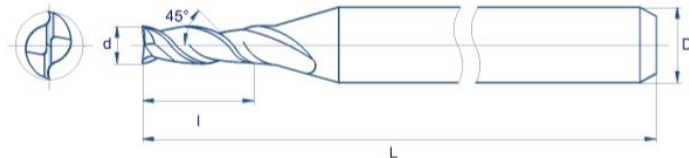
2 dents  
coupe à droite, par cisailage  
oblique

Angle d'hélice: 30°

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. no.<br>Réf. | Ø d<br>in mm | l<br>in mm | L<br>in mm | ØD<br>h6<br>in mm |
|------------------------------------|-------------------------------|--------------|------------|------------|-------------------|
| 155223                             | M9661F.0300.090.038.03        | 3,0          | 9,0        | 38         | 3                 |
| 155225                             | M9661F.0300.120.038.03        | 3,0          | 12,0       | 38         | 3                 |
| 155226                             | M9661F.0400.080.050.06        | 4,0          | 8,0        | 50         | 6                 |
| 155228                             | M9661F.0400.120.050.04        | 4,0          | 12,0       | 50         | 4                 |
| 155229                             | M9661F.0500.100.050.06        | 5,0          | 10,0       | 50         | 6                 |
| 155230                             | M9661F.0500.150.050.06        | 5,0          | 15,0       | 50         | 6                 |
| 155231                             | M9661F.0600.120.050.06        | 6,0          | 12,0       | 50         | 6                 |
| 155234                             | M9661F.0600.180.050.06        | 6,0          | 18,0       | 60         | 6                 |
| 155236                             | M9661F.0800.120.050.08        | 8,0          | 12,0       | 50         | 8                 |
| 155238                             | M9661F.0800.200.060.08        | 8,0          | 20,0       | 60         | 8                 |
| 155239                             | M9661F.1000.120.050.10        | 10,0         | 12,0       | 50         | 10                |
| 155242                             | M9661F.1000.220.075.10        | 10,0         | 22,0       | 75         | 10                |
| 155243                             | M9661F.1200.220.075.12        | 12,0         | 22         | 75         | 12                |

Oben aufgeführte Werkzeuge ab Lager lieferbar  
Tools listed above available from stock  
Les outils susmentionnés sont en stock

Zwischenabmessungen kurzfristig lieferbar  
Intermediate dimensions available at short notice  
Dimensions intermédiaires livrables sous court délai



## System/Système M8381

|                      |                      |                            |                            |                          |                          |                        |                       |                        |                         |                 |
|----------------------|----------------------|----------------------------|----------------------------|--------------------------|--------------------------|------------------------|-----------------------|------------------------|-------------------------|-----------------|
| <b>ALU</b><br><10%Si | <b>ALU</b><br>>10%Si | <b>STEEL</b><br><1000N/mm² | <b>STEEL</b><br>>1000N/mm² | <b>INOX</b><br><850N/mm² | <b>INOX</b><br>>850N/mm² | <b>Ti</b><br>>850N/mm² | <b>CAST</b><br>GGG/GG | <b>Cu(Zn)</b><br>Au/Ag | <b>CFRP</b><br>Graphite | <b>Plastics</b> |
|----------------------|----------------------|----------------------------|----------------------------|--------------------------|--------------------------|------------------------|-----------------------|------------------------|-------------------------|-----------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / appropriée

● - nicht geeignet / suitable / ne approprié

### VHM-Schaftfräser für den HPC-Einsatz (RH/RC)

2 Schneiden  
rechtsschneidend, ziehend

Drallwinkel: 45°

Für Aluminium, weiche NE-Metalle und Kunststoffe

### Solid carbide end mill for HPC milling (RH/RC)

2 flutes  
right-hand cutting, up-cut

Helix angle: 45°

For aluminium, soft non-ferrous materials and plastics

### Fraise à queue cylindrique en carbure pour HPC (RH/RC)

2 dents  
coupe à droite, par cisailage oblique

Angle d'hélice: 45°

Pour aluminium, matériaux non-ferreux et plastiques

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. no.<br>Réf. | Ø d<br>in mm | l<br>in mm | L<br>in mm | ØD<br>h6<br>in mm |
|------------------------------------|-------------------------------|--------------|------------|------------|-------------------|
| 155245                             | M8381.0100.030.038.03         | 1            | 3          | 38         | 3                 |
| 155246                             | M8381.0150.045.038.03         | 1,5          | 4,5        | 38         | 3                 |
| 155247                             | M8381.0200.060.038.03         | 2            | 6          | 38         | 3                 |
| 155249                             | M8381.0200.060.050.06         | 2            | 6          | 50         | 6                 |
| 155251                             | M8381.0300.090.038.03         | 3            | 9          | 38         | 3                 |
| 155250                             | M8381.0300.090.050.06         | 3            | 9          | 50         | 6                 |
| 155252                             | M8381.0400.120.050.04         | 4            | 12         | 50         | 4                 |
| 155253                             | M8381.0400.120.050.06         | 4            | 12         | 50         | 6                 |
| 155254                             | M8381.0600.120.050.06         | 6            | 12         | 50         | 6                 |
| 155255                             | M8381.0600.180.060.06         | 6            | 18         | 60         | 6                 |
| 155256                             | M8381.0800.240.075.08         | 8            | 24         | 75         | 8                 |
|                                    |                               |              |            |            |                   |
|                                    |                               |              |            |            |                   |
|                                    |                               |              |            |            |                   |

HPC = Hochleistungszerspanung

HPC= highperformance cutting

HPC= pour l'usinage haute performance

Oben aufgeführte Werkzeuge ab Lager lieferbar

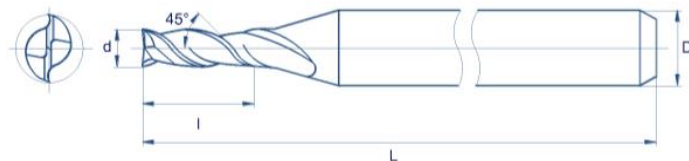
Tools listed above available from stock

Les outils susmentionnés sont en stock

Zwischenabmessungen kurzfristig lieferbar

Intermediate dimensions available at short notice

Dimensions intermédiaires livrables sous court délai



## System/Système M8381N

|                      |                      |                                        |                                        |                                      |                                      |                                    |                       |                        |                         |                 |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|
| <b>ALU</b><br><10%Si | <b>ALU</b><br>>10%Si | <b>STEEL</b><br><1000N/mm <sup>2</sup> | <b>STEEL</b><br>>1000N/mm <sup>2</sup> | <b>INOX</b><br><850N/mm <sup>2</sup> | <b>INOX</b><br>>850N/mm <sup>2</sup> | <b>Ti</b><br>>850N/mm <sup>2</sup> | <b>CAST</b><br>GGG/GG | <b>Cu(Zn)</b><br>Au/Ag | <b>CFRP</b><br>Graphite | <b>Plastics</b> |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

### VHM-Schaftfräser für den HPC-Einsatz (RH/RC)

2 Schneiden  
rechtsschneidend, ziehend

Drallwinkel: 45°

Für Aluminium, weiche NE-Metalle und Kunststoffe

nACRo beschichtet

### Solid carbide end mill for HPC milling (RH/RC)

2 flutes  
right-hand cutting, up-cut

Helix angle: 45°

For aluminium, soft non-ferrous materials and plastics

nACRo coated

### Fraise à queue cylindrique en carbure pour HPC (RH/RC)

2 dents  
coupe à droite, par cisailage oblique

Angle d'hélice: 45°

Pour aluminium, matériaux non-ferreux et plastiques

revêtement: nACRo

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. no.<br>Réf. | Ø d<br>in mm | l<br>in mm | L<br>in mm | ØD<br>h6<br>in mm |
|------------------------------------|-------------------------------|--------------|------------|------------|-------------------|
| 155258                             | M8381N.0100.030.038.03        | 1            | 3          | 38         | 3                 |
| 155259                             | M8381N.0150.045.038.03        | 1,5          | 4,5        | 38         | 3                 |
| 155260                             | M8381N.0200.060.038.03        | 2            | 6          | 38         | 3                 |
| 155261                             | M8381N.0200.060.050.06        | 2            | 6          | 50         | 6                 |
| 155262                             | M8381N.0300.090.038.03        | 3            | 9          | 38         | 3                 |
| 155263                             | M8381N.0300.090.050.06        | 3            | 9          | 50         | 6                 |
| 155265                             | M8381N.0400.120.050.04        | 4            | 12         | 50         | 4                 |
| 155266                             | M8381N.0400.120.050.06        | 4            | 12         | 50         | 6                 |
| 155267                             | M8381N.0600.120.050.06        | 6            | 12         | 50         | 6                 |
| 155268                             | M8381N.0600.180.060.06        | 6            | 18         | 60         | 6                 |
| 155269                             | M8381N.0800.240.075.08        | 8            | 24         | 75         | 8                 |
|                                    |                               |              |            |            |                   |
|                                    |                               |              |            |            |                   |
|                                    |                               |              |            |            |                   |

HPC = Hochleistungszerspanung

HPC= highperformance cutting

HPC= pour l'usinage haute performance

Oben aufgeführte Werkzeuge ab Lager lieferbar

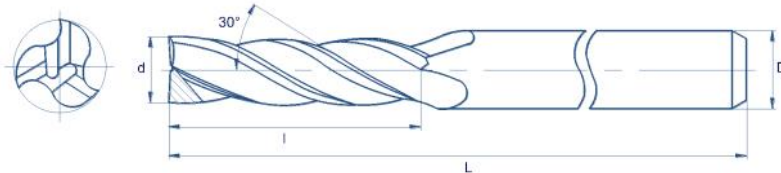
Tools listed above available from stock

Les outils susmentionnés sont en stock

Zwischenabmessungen kurzfristig lieferbar

Intermediate dimensions available at short notice

Dimensions intermédiaires livrables sous court délai



## System/Système M9681

|                      |                      |                                        |                                        |                                      |                                      |                                    |                       |                        |                         |                 |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|
| <b>ALU</b><br><10%Si | <b>ALU</b><br>>10%Si | <b>STEEL</b><br><1000N/mm <sup>2</sup> | <b>STEEL</b><br>>1000N/mm <sup>2</sup> | <b>INOX</b><br><850N/mm <sup>2</sup> | <b>INOX</b><br>>850N/mm <sup>2</sup> | <b>Ti</b><br>>850N/mm <sup>2</sup> | <b>CAST</b><br>GGG/GG | <b>Cu(Zn)</b><br>Au/Ag | <b>CFRP</b><br>Graphite | <b>Plastics</b> |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

### VHM Mikro-Schaftfräser (RH/RC)

3 Schneiden  
rechtsschneidend, ziehend

Drallwinkel: 30°

### Solid carbide micro end mill (RH/RC)

3 flutes  
right-hand cutting, up-cut

Helix angle: 30°

### Mini fraise en carbure (RH/RC)

3 dents  
coupe à droite, par cisailage  
oblique

Angle d'hélice: 30°

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. no.<br>Réf. | Ø d<br>in mm | l<br>in mm | L<br>in mm | ØD<br>h6<br>in mm |  |
|------------------------------------|-------------------------------|--------------|------------|------------|-------------------|--|
| 155270                             | M9681.0100.030.038.03         | 1,0          | 3,0        | 38         | 3                 |  |
| 155271                             | M9681.0100.050.038.03         | 1,0          | 5,0        | 38         | 3                 |  |
| 155272                             | M9681.0120.036.038.03         | 1,2          | 3,6        | 38         | 3                 |  |
| 155278                             | M9681.0120.060.038.03         | 1,2          | 6,0        | 38         | 3                 |  |
| 155279                             | M9681.0150.048.038.03         | 1,5          | 4,8        | 38         | 3                 |  |
| 155280                             | M9681.0150.075.038.03         | 1,5          | 7,5        | 38         | 3                 |  |
| 155282                             | M9681.0200.060.038.03         | 2,0          | 6,0        | 38         | 3                 |  |
| 155283                             | M9681.0200.070.050.06         | 2,0          | 7,0        | 50         | 6                 |  |
| 155284                             | M9681.0200.090.038.03         | 2,0          | 9,0        | 38         | 3                 |  |
| 155285                             | M9681.0250.075.038.03         | 2,5          | 7,5        | 38         | 3                 |  |
| 155286                             | M9681.0250.100.038.03         | 2,5          | 10         | 38         | 3                 |  |
| 155287                             | M9681.0300.070.050.06         | 3,0          | 7,0        | 50         | 6                 |  |
| 155289                             | M9681.0300.090.038.03         | 3,0          | 9,0        | 38         | 3                 |  |
| 155290                             | M9681.0300.120.038.03         | 3,0          | 12,0       | 38         | 3                 |  |
| 155291                             | M9681.0400.080.050.06         | 4,0          | 8,0        | 50         | 6                 |  |
| 155292                             | M9681.0400.120.050.04         | 4,0          | 12,0       | 50         | 4                 |  |
| 155293                             | M9681.0500.100.050.06         | 5,0          | 10,0       | 50         | 6                 |  |
| 155294                             | M9681.0500.150.050.06         | 5,0          | 15,0       | 50         | 6                 |  |
| 155295                             | M9681.0600.120.050.06         | 6,0          | 12,0       | 50         | 6                 |  |
| 155296                             | M9681.0600.180.060.06         | 6,0          | 18,0       | 60         | 6                 |  |
| 155297                             | M9681.0800.120.050.08         | 8,0          | 12,0       | 50         | 8                 |  |
| 155298                             | M9681.0800.200.060.08         | 8,0          | 20,0       | 60         | 8                 |  |
| 155299                             | M9681.1000.120.050.10         | 10,0         | 12,0       | 50         | 10                |  |
| 155300                             | M9681.1000.220.075.10         | 10,0         | 22,0       | 75         | 10                |  |
| 155301                             | M9681.1200.220.075.12         | 12,0         | 22         | 75         | 12                |  |

Oben aufgeführte Werkzeuge ab Lager lieferbar

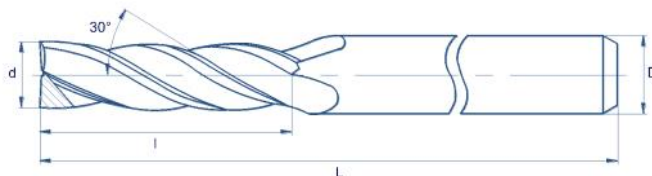
Tools listed above available from stock

Les outils susmentionnés sont en stock

Zwischenabmessungen kurzfristig lieferbar

Intermediate dimensions available at short notice

Dimensions intermédiaires livrables sous court délai



## System/Système M9681F TiAIN

|                      |                      |                                        |                                        |                                      |                                      |                                    |                       |                        |                         |                 |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|
| <b>ALU</b><br><10%Si | <b>ALU</b><br>>10%Si | <b>STEEL</b><br><1000N/mm <sup>2</sup> | <b>STEEL</b><br>>1000N/mm <sup>2</sup> | <b>INOX</b><br><850N/mm <sup>2</sup> | <b>INOX</b><br>>850N/mm <sup>2</sup> | <b>Ti</b><br>>850N/mm <sup>2</sup> | <b>CAST</b><br>GGG/GG | <b>Cu(Zn)</b><br>Au/Ag | <b>CFRP</b><br>Graphite | <b>Plastics</b> |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

### VHM Mikro-Schaftfräser (RH/RC)

**TiAIN beschichtet**

3 Schneiden  
rechtsschneidend, ziehend  
Drallwinkel: 30°  
Für Stahl, Guss und Messing

### Solid carbide micro end mill (RH/RC)

**TiAIN coated**

3 flutes  
right-hand cutting, up-cut  
Helix angle: 30°  
For steel, cast iron and  
Cu(Zn) alloys

### Mini fraise en carbure (RH/RC)

**Revêtement: TiAIN**

3 dents  
coupe à droite, par cisailage  
oblique  
Angle d'hélice: 30°  
Pour acier, fonte et  
laiton

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. no.<br>Réf. | Ø d<br>in mm | l<br>in mm | L<br>in mm | ØD<br>h6<br>in mm |  |
|------------------------------------|-------------------------------|--------------|------------|------------|-------------------|--|
| 155973                             | M9681F.0100.030.038.03        | 1,0          | 3,0        | 38         | 3                 |  |
| 155974                             | M9681F.0100.050.038.03        | 1,0          | 5,0        | 38         | 3                 |  |
| 155975                             | M9681F.0120.036.038.03        | 1,2          | 3,6        | 38         | 3                 |  |
| 155976                             | M9681F.0120.060.038.03        | 1,2          | 6,0        | 38         | 3                 |  |
| 155977                             | M9681F.0150.045.038.03        | 1,5          | 4,8        | 38         | 3                 |  |
| 155978                             | M9681F.0150.075.038.03        | 1,5          | 7,5        | 38         | 3                 |  |
| 155979                             | M9681F.0200.060.038.03        | 2,0          | 6,0        | 38         | 3                 |  |
| 155980                             | M9681F.0200.070.050.06        | 2,0          | 7,0        | 50         | 6                 |  |
| 155981                             | M9681F.0200.090.038.03        | 2,0          | 9,0        | 38         | 3                 |  |
| 155982                             | M9681F.0250.075.038.03        | 2,5          | 7,5        | 38         | 3                 |  |
| 155983                             | M9681F.0250.100.038.03        | 2,5          | 10         | 38         | 3                 |  |
| 155984                             | M9681F.0300.070.050.06        | 3,0          | 7,0        | 50         | 6                 |  |
| 155985                             | M9681F.0300.090.038.03        | 3,0          | 9,0        | 38         | 3                 |  |
| 155986                             | M9681F.0300.120.038.03        | 3,0          | 12,0       | 38         | 3                 |  |
| 155987                             | M9681F.0400.080.050.06        | 4,0          | 8,0        | 50         | 6                 |  |
| 155988                             | M9681F.0400.120.050.04        | 4,0          | 12,0       | 50         | 4                 |  |
| 155989                             | M9681F.0500.100.050.06        | 5,0          | 10,0       | 50         | 6                 |  |
| 155990                             | M9681F.0500.150.050.06        | 5,0          | 15,0       | 50         | 6                 |  |
| 155991                             | M9681F.0600.120.050.06        | 6,0          | 12,0       | 50         | 6                 |  |
| 155992                             | M9681F.0600.180.060.06        | 6,0          | 18,0       | 60         | 6                 |  |
| 155993                             | M9681F.0800.120.050.08        | 8,0          | 12,0       | 50         | 8                 |  |
| 155994                             | M9681F.0800.200.060.08        | 8,0          | 20,0       | 60         | 8                 |  |
| 155995                             | M9681F.1000.120.050.10        | 10,0         | 12,0       | 50         | 10                |  |
| 155996                             | M9681F.1000.220.075.10        | 10,0         | 22,0       | 75         | 10                |  |
| 155997                             | M9681F.1200.220.075.12        | 12,0         | 22         | 75         | 12                |  |

Oben aufgeführte Werkzeuge ab Lager lieferbar

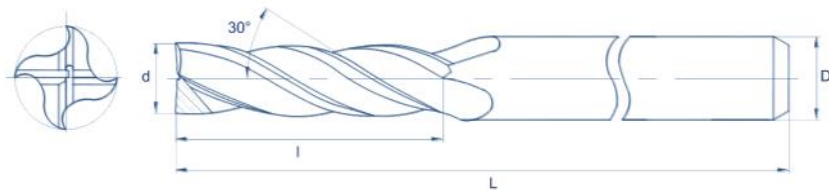
Tools listed above available from stock

Les outils susmentionnés sont en stock

Zwischenabmessungen kurzfristig lieferbar

Intermediate dimensions available at short notice

Dimensions intermédiaires livrables sous court délai



## System/Système M9671

|                      |                      |                                        |                                        |                                      |                                      |                                    |                       |                        |                         |                 |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|
| <b>ALU</b><br><10%Si | <b>ALU</b><br>>10%Si | <b>STEEL</b><br><1000N/mm <sup>2</sup> | <b>STEEL</b><br>>1000N/mm <sup>2</sup> | <b>INOX</b><br><850N/mm <sup>2</sup> | <b>INOX</b><br>>850N/mm <sup>2</sup> | <b>Ti</b><br>>850N/mm <sup>2</sup> | <b>CAST</b><br>GGG/GG | <b>Cu(Zn)</b><br>Au/Ag | <b>CFRP</b><br>Graphite | <b>Plastics</b> |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

### VHM Mikro-Schaftfräser mit Zentrumsschnitt (RH/RC)

4 Schneiden  
rechtsschneidend, ziehend  
Drallwinkel: 30°

### Solid carbide micro end mill with centre cut (RH/RC)

4 flutes  
right-hand cutting, up-cut  
Helix angle: 30°

### Mini fraise en carbure avec coupe au centre (RH/RC)

4 dents  
coupe à droite, par cisailage  
oblique  
Angle d'hélice: 30°

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. no.<br>Réf. | Ø d<br>in mm | l<br>in mm | L<br>in mm | ØD<br>h6<br>in mm |  |
|------------------------------------|-------------------------------|--------------|------------|------------|-------------------|--|
| 155302                             | M9671.0020.006.038.03         | 0,2          | 0,6        | 38         | 3                 |  |
| 155303                             | M9671.0050.015.038.03         | 0,5          | 1,5        | 38         | 3                 |  |
| 155304                             | M9671.0100.030.038.03         | 1            | 3          | 38         | 3                 |  |
| 155305                             | M9671.0150.045.038.03         | 1,5          | 4,5        | 38         | 3                 |  |
| 155306                             | M9671.0200.060.038.03         | 2            | 6          | 38         | 3                 |  |
| 155307                             | M9671.0200.070.038.06         | 2            | 7          | 38         | 6                 |  |
| 155308                             | M9671.0200.090.038.03         | 2            | 9          | 38         | 3                 |  |
| 155309                             | M9671.0250.075.038.03         | 2,5          | 7,5        | 38         | 3                 |  |
| 155310                             | M9671.0300.070.050.06         | 3            | 7          | 50         | 6                 |  |
| 155311                             | M9671.0300.090.038.03         | 3            | 9          | 38         | 3                 |  |
| 155312                             | M9671.0300.120.038.03         | 3            | 12         | 38         | 3                 |  |
| 155313                             | M9671.0400.080.050.06         | 4            | 8          | 50         | 6                 |  |
| 155314                             | M9671.0400.120.045.04         | 4            | 12         | 45         | 4                 |  |
| 155315                             | M9671.0400.120.045.06         | 4            | 12         | 45         | 6                 |  |
| 155317                             | M9671.0400.160.045.04         | 4            | 16         | 45         | 4                 |  |
| 155318                             | M9671.0400.160.045.06         | 4            | 16         | 45         | 6                 |  |
| 155319                             | M9671.0500.100.050.06         | 5            | 10         | 50         | 6                 |  |
| 155320                             | M9671.0500.150.050.05         | 5            | 15         | 50         | 5                 |  |
| 155321                             | M9671.0500.150.050.06         | 5            | 15         | 50         | 6                 |  |
| 155322                             | M9671.0600.120.050.06         | 6            | 12         | 50         | 6                 |  |
| 155323                             | M9671.0600.180.060.06         | 6            | 18         | 60         | 6                 |  |
| 155324                             | M9671.0800.200.060.08         | 8            | 20         | 60         | 8                 |  |
| 155325                             | M9671.1000.120.050.10         | 10           | 12         | 50         | 10                |  |
| 155326                             | M9671.1000.220.075.10         | 10           | 22         | 75         | 10                |  |
| 155327                             | M9671.1200.220.075.12         | 12           | 22         | 75         | 12                |  |

Oben aufgeführte Werkzeuge ab Lager lieferbar

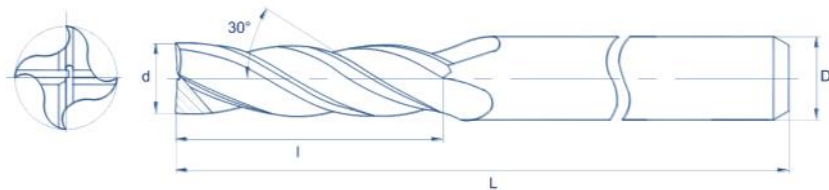
Tools listed above available from stock

Les outils susmentionnés sont en stock

Zwischenabmessungen kurzfristig lieferbar

Intermediate dimensions available at short notice

Dimensions intermédiaires livrables sous court délai



## System/Système M9671F

|                      |                      |                                        |                                        |                                      |                                      |                                    |                       |                        |                         |                 |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|
| <b>ALU</b><br><10%Si | <b>ALU</b><br>>10%Si | <b>STEEL</b><br><1000N/mm <sup>2</sup> | <b>STEEL</b><br>>1000N/mm <sup>2</sup> | <b>INOX</b><br><850N/mm <sup>2</sup> | <b>INOX</b><br>>850N/mm <sup>2</sup> | <b>Ti</b><br>>850N/mm <sup>2</sup> | <b>CAST</b><br>GGG/GG | <b>Cu(Zn)</b><br>Au/Ag | <b>CFRP</b><br>Graphite | <b>Plastics</b> |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

### VHM Mikro-Schaftfräser mit Zentrumsschnitt (RH/RC)

**TiAlN beschichtet**

4 Schneiden  
rechtsschneidend, ziehend

Drallwinkel: 30°

Für Stahl, Guss und Cu(Zn)-  
Legierung

### Solid carbide micro end mill with centre cut (RH/RC)

**TiAlN coated**

4 flutes  
right-hand cutting, up-cut

Helix angle: 30°

For steel, cast iron  
and Cu(Zn) alloys

### Mini fraise en carbure avec coupe au centre (RH/RC)

**Revêtement: TiAlN**

4 dents  
coupe à droite, par cisailage  
oblique

Angle d'hélice: 30°

Pour acier, fonte et  
alliages Cu(Zn)

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. no.<br>Réf. | Ø d<br>in mm | l<br>in mm | L<br>in mm | ØD<br>h6<br>in mm |  |
|------------------------------------|-------------------------------|--------------|------------|------------|-------------------|--|
| 155328                             | M9671F.0020.006.038.03        | 0,2          | 0,6        | 38         | 3                 |  |
| 155329                             | M9671F.0050.015.038.03        | 0,5          | 1,5        | 38         | 3                 |  |
| 155330                             | M9671F.0100.030.038.03        | 1            | 3          | 38         | 3                 |  |
| 155331                             | M9671F.0150.045.038.03        | 1,5          | 4,5        | 38         | 3                 |  |
| 155332                             | M9671F.0200.060.038.03        | 2            | 6          | 38         | 3                 |  |
| 155333                             | M9671F.0200.070.038.06        | 2            | 7          | 38         | 6                 |  |
| 155334                             | M9671F.0200.090.038.03        | 2            | 9          | 38         | 3                 |  |
| 155335                             | M9671F.0250.075.038.03        | 2,5          | 7,5        | 38         | 3                 |  |
| 155336                             | M9671F.0300.070.050.06        | 3            | 7          | 50         | 6                 |  |
| 155337                             | M9671F.0300.090.038.03        | 3            | 9          | 38         | 3                 |  |
| 155338                             | M9671F.0300.120.038.03        | 3            | 12         | 38         | 3                 |  |
| 155339                             | M9671F.0400.080.050.06        | 4            | 8          | 50         | 6                 |  |
| 155340                             | M9671F.0400.120.045.04        | 4            | 12         | 45         | 4                 |  |
| 155341                             | M9671F.0400.120.045.06        | 4            | 12         | 45         | 6                 |  |
| 155342                             | M9671F.0400.160.045.04        | 4            | 16         | 45         | 4                 |  |
| 155343                             | M9671F.0400.160.045.06        | 4            | 16         | 45         | 6                 |  |
| 155345                             | M9671F.0500.100.050.06        | 5            | 10         | 50         | 6                 |  |
| 155346                             | M9671F.0500.150.050.05        | 5            | 15         | 50         | 5                 |  |
| 155347                             | M9671F.0500.150.050.06        | 5            | 15         | 50         | 6                 |  |
| 155349                             | M9671F.0600.120.050.06        | 6            | 12         | 50         | 6                 |  |
| 155350                             | M9671F.0600.180.060.06        | 6            | 18         | 60         | 6                 |  |
| 155351                             | M9671F.0800.200.060.08        | 8            | 20         | 60         | 8                 |  |
| 155352                             | M9671F.1000.120.050.10        | 10           | 12         | 50         | 10                |  |
| 155353                             | M9671F.1000.220.075.10        | 10           | 22         | 75         | 10                |  |
| 155354                             | M9671F.1200.220.075.12        | 12           | 22         | 75         | 12                |  |

Oben aufgeführte Werkzeuge ab Lager lieferbar

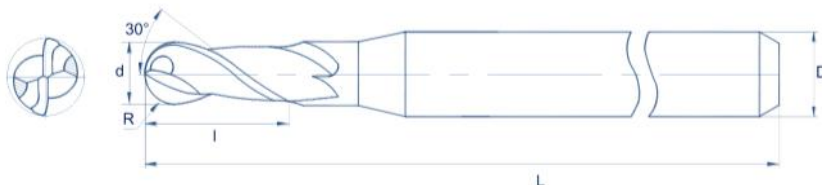
Tools listed above available from stock

Les outils susmentionnés sont en stock

Zwischenabmessungen kurzfristig lieferbar

Intermediate dimensions available at short notice

Dimensions intermédiaires livrables sous court délai



## System/Système M9701

|                      |                      |                                        |                                        |                                      |                                      |                                    |                       |                        |                         |                 |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|
| <b>ALU</b><br><10%Si | <b>ALU</b><br>>10%Si | <b>STEEL</b><br><1000N/mm <sup>2</sup> | <b>STEEL</b><br>>1000N/mm <sup>2</sup> | <b>INOX</b><br><850N/mm <sup>2</sup> | <b>INOX</b><br>>850N/mm <sup>2</sup> | <b>Ti</b><br>>850N/mm <sup>2</sup> | <b>CAST</b><br>GGG/GG | <b>Cu(Zn)</b><br>Au/Ag | <b>CFRP</b><br>Graphite | <b>Plastics</b> |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

### VHM Mikro-Radiusfräser mit Zentrumsschnitt (RH/RC)

2 Schneiden  
rechtsschneidend, ziehend

Drallwinkel: 30°

#### Formgenauigkeit:

Radius ± 0,005 (R0,1-R1,5)

Radius ± 0,010 (R2,0-R6,0)

### Solid carbide micro ball nose end mill with centre cut (RH/RC)

2 flutes  
right-hand cutting, up-cut

Helix angle: 30°

#### Accuracy of shape:

radius ± 0,005 (R0,1-R1,5)

radius ± 0,010 (R2,0-R6,0)

### Mini fraise hémisphérique en carbure avec coupe au centre (RH/RC)

2 dents  
coupe à droite, par cisailage  
oblique

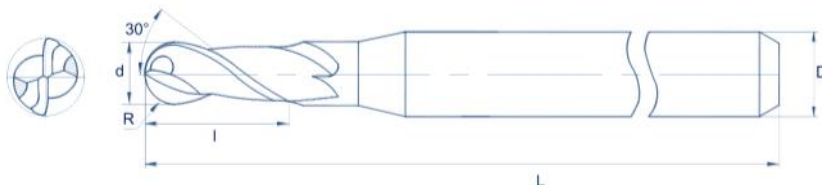
Angle d'hélice: 30°

#### Précision de forme:

rayon ± 0,005 (R0,1-R1,5)

rayon ± 0,010 (R2,0-R6,0)

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. no.<br>Réf. | Ø d<br>in mm | l<br>in mm | L<br>in mm | ØD<br>h6<br>in mm | R<br>in mm |
|------------------------------------|-------------------------------|--------------|------------|------------|-------------------|------------|
| 155357                             | M9701.0020.002.038.03         | 0,2          | 0,2        | 38         | 3                 | 0,1        |
| 155358                             | M9701.0020.004.038.03         | 0,2          | 0,4        | 38         | 3                 | 0,1        |
| 155359                             | M9701.0030.003.038.03         | 0,3          | 0,3        | 38         | 3                 | 0,15       |
| 155360                             | M9701.0030.006.038.03         | 0,3          | 0,6        | 38         | 3                 | 0,15       |
| 155361                             | M9701.0040.004.038.03         | 0,4          | 0,4        | 38         | 3                 | 0,2        |
| 155362                             | M9701.0040.008.038.03         | 0,4          | 0,8        | 38         | 3                 | 0,2        |
| 155363                             | M9701.0040.015.038.03         | 0,4          | 1,5        | 38         | 3                 | 0,2        |
| 155364                             | M9701.0050.005.038.03         | 0,5          | 0,5        | 38         | 3                 | 0,25       |
| 155365                             | M9701.0050.010.038.03         | 0,5          | 1          | 38         | 3                 | 0,25       |
| 155366                             | M9701.0050.015.038.03         | 0,5          | 1,5        | 38         | 3                 | 0,25       |
| 155367                             | M9701.0060.006.038.03         | 0,6          | 0,6        | 38         | 3                 | 0,3        |
| 155368                             | M9701.0060.012.038.03         | 0,6          | 1,2        | 38         | 3                 | 0,3        |
| 155369                             | M9701.0060.020.038.03         | 0,6          | 2          | 38         | 3                 | 0,3        |
| 155370                             | M9701.0070.007.038.03         | 0,7          | 0,7        | 38         | 3                 | 0,35       |
| 155371                             | M9701.0070.014.038.03         | 0,7          | 1,4        | 38         | 3                 | 0,35       |
| 155372                             | M9701.0070.030.038.03         | 0,7          | 3          | 38         | 3                 | 0,35       |
| 155373                             | M9701.0080.008.038.03         | 0,8          | 0,8        | 38         | 3                 | 0,4        |
| 155374                             | M9701.0080.016.038.03         | 0,8          | 1,6        | 38         | 3                 | 0,4        |
| 155375                             | M9701.0080.030.038.03         | 0,8          | 3          | 38         | 3                 | 0,4        |
| 155376                             | M9701.0090.009.038.03         | 0,9          | 0,9        | 38         | 3                 | 0,45       |
| 155377                             | M9701.0090.018.038.03         | 0,9          | 1,8        | 38         | 3                 | 0,45       |
| 155378                             | M9701.0100.010.038.03         | 1            | 1          | 38         | 3                 | 0,5        |
| 155379                             | M9701.0100.020.038.03         | 1            | 2          | 38         | 3                 | 0,5        |
| 155380                             | M9701.0100.030.038.03         | 1            | 3          | 38         | 3                 | 0,5        |
| 155381                             | M9701.0100.040.038.03         | 1            | 4          | 38         | 3                 | 0,5        |
| 155382                             | M9701.0120.024.038.03         | 1,2          | 2,4        | 38         | 3                 | 0,6        |
| 155383                             | M9701.0120.036.038.03         | 1,2          | 3,6        | 38         | 3                 | 0,6        |
| 155384                             | M9701.0140.028.038.03         | 1,4          | 2,8        | 38         | 3                 | 0,7        |
| 155385                             | M9701.0140.042.038.03         | 1,4          | 4,2        | 38         | 3                 | 0,7        |
| 155386                             | M9701.0150.030.038.03         | 1,5          | 3          | 38         | 3                 | 0,75       |



## System/Système M9701

|                      |                      |                                        |                                        |                                      |                                      |                                    |                       |                        |                         |                 |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|
| <b>ALU</b><br><10%Si | <b>ALU</b><br>>10%Si | <b>STEEL</b><br><1000N/mm <sup>2</sup> | <b>STEEL</b><br>>1000N/mm <sup>2</sup> | <b>INOX</b><br><850N/mm <sup>2</sup> | <b>INOX</b><br>>850N/mm <sup>2</sup> | <b>Ti</b><br>>850N/mm <sup>2</sup> | <b>CAST</b><br>GGG/GG | <b>Cu(Zn)</b><br>Au/Ag | <b>CFRP</b><br>Graphite | <b>Plastics</b> |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

### VHM Mikro-Radiusfräser mit Zentrumsschnitt (RH/RC)

2 Schneiden  
rechtsschneidend, ziehend

Drallwinkel: 30°

#### Formgenauigkeit:

Radius ± 0,005 (R0,1-R1,5)

Radius ± 0,010 (R2,0-R6,0)

### Solid carbide micro ball nose end mill with centre cut (RH/RC)

2 flutes  
right-hand cutting, up-cut

Helix angle: 30°

#### Accuracy of shape:

radius ± 0,005 (R0,1-R1,5)

radius ± 0,010 (R2,0-R6,0)

### Mini fraise hémisphérique en carbure avec coupe au centre (RH/RC)

2 dents  
coupe à droite, par cisailage  
oblique

Angle d'hélice: 30°

#### Précision de forme:

rayon ± 0,005 (R0,1-R1,5)

rayon ± 0,010 (R2,0-R6,0)

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Order Nr.<br>Réf. | Ø d<br>in mm | l<br>in mm | L<br>in mm | ØD<br>h6<br>in mm | R<br>in mm |
|------------------------------------|--------------------------------|--------------|------------|------------|-------------------|------------|
| 155387                             | M9701.0150.045.038.03          | 1,5          | 4,5        | 38         | 3                 | 0,75       |
| 155388                             | M9701.0160.032.038.03          | 1,6          | 3,2        | 38         | 3                 | 0,8        |
| 155389                             | M9701.0160.048.038.03          | 1,6          | 4,8        | 38         | 3                 | 0,8        |
| 155390                             | M9701.0180.036.038.03          | 1,8          | 3,6        | 38         | 3                 | 0,9        |
| 155391                             | M9701.0180.054.038.03          | 1,8          | 5,4        | 38         | 3                 | 0,9        |
| 155392                             | M9701.0200.040.038.04          | 2            | 4          | 38         | 4                 | 1          |
| 155393                             | M9701.0200.060.038.03          | 2            | 6          | 38         | 3                 | 1          |
| 155394                             | M9701.0200.060.038.06          | 2            | 6          | 38         | 6                 | 1          |
| 155395                             | M9701.0250.050.038.06          | 2,5          | 5          | 38         | 6                 | 1,25       |
| 155396                             | M9701.0250.075.038.06          | 2,5          | 7,5        | 38         | 6                 | 1,25       |
| 155397                             | M9701.0300.060.038.06          | 3            | 6          | 38         | 6                 | 1,5        |
| 155398                             | M9701.0300.080.038.03          | 3            | 8          | 38         | 3                 | 1,5        |
| 155399                             | M9701.0300.120.040.03          | 3            | 12         | 40         | 3                 | 1,5        |
| 155400                             | M9701.0300.250.060.03          | 3            | 25         | 60         | 3                 | 1,5        |
| 155402                             | M9701.0400.080.045.06          | 4            | 8          | 45         | 6                 | 2          |
| 155403                             | M9701.0400.120.045.04          | 4            | 12         | 45         | 4                 | 2          |
| 155404                             | M9701.0500.080.045.06          | 5            | 8          | 50         | 6                 | 2,5        |
| 155405                             | M9701.0600.100.050.06          | 6            | 10         | 50         | 6                 | 3          |
| 155406                             | M9701.0600.160.050.06          | 6            | 16         | 50         | 6                 | 3          |
| 155408                             | M9701.0800.160.050.08          | 8            | 16         | 50         | 8                 | 4          |
| 155409                             | M9701.0800.350.075.08          | 8            | 35         | 75         | 8                 | 4          |
| 155411                             | M9701.1000.220.070.10          | 10           | 22         | 70         | 10                | 5          |
| 155412                             | M9701.1000.450.100.10          | 10           | 45         | 100        | 10                | 5          |
| 155413                             | M9701.1200.220.070.12          | 12           | 22         | 70         | 12                | 6          |
| 155414                             | M9701.1200.450.100.12          | 12           | 45         | 100        | 12                | 6          |

Oben aufgeführte Werkzeuge ab Lager lieferbar

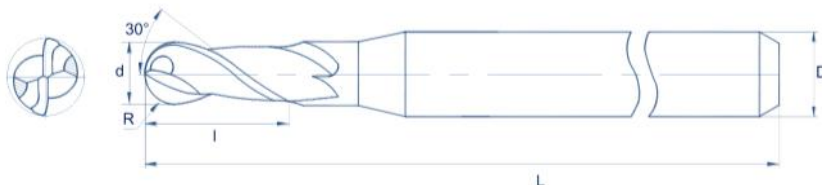
Tools listed above available from stock

Les outils susmentionnés sont en stock

Zwischenabmessungen kurzfristig lieferbar

Intermediate dimensions available at short notice

Dimensions intermédiaires livrables sous court délai



## System/Système M9701F

|                      |                      |                                        |                                        |                                      |                                      |                                    |                       |                        |                         |                 |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|
| <b>ALU</b><br><10%Si | <b>ALU</b><br>>10%Si | <b>STEEL</b><br><1000N/mm <sup>2</sup> | <b>STEEL</b><br>>1000N/mm <sup>2</sup> | <b>INOX</b><br><850N/mm <sup>2</sup> | <b>INOX</b><br>>850N/mm <sup>2</sup> | <b>Ti</b><br>>850N/mm <sup>2</sup> | <b>CAST</b><br>GGG/GG | <b>Cu(Zn)</b><br>Au/Ag | <b>CFRP</b><br>Graphite | <b>Plastics</b> |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

### VHM Mikro-Radiusfräser mit Zentrumsschnitt (RH/RC)

**TiAlN beschichtet**

2 Schneiden  
rechtsschneidend, ziehend

Drallwinkel: 30°

**Formgenauigkeit:**

Radius ± 0,005 (R0,1-R1,5)

Radius ± 0,010 (R2,0-R6,0)

### Solid carbide micro ball nose end mill with centre cut (RH/RC)

**TiAlN coated**

2 flutes  
right-hand cutting, up-cut

Helix angle: 30°

**Accuracy of shape:**

radius ± 0,005 (R0,1-R1,5)

radius ± 0,010 (R2,0-R6,0)

### Mini fraise hémisphérique en carbure avec coupe au centre (RH/RC)

**Revêtement: TiAlN**

2 dents  
coupe à droite, par cisailage  
oblique

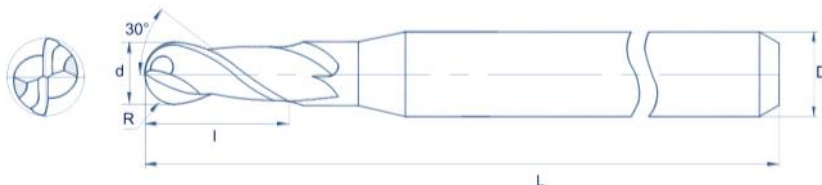
Angle d'hélice: 30°

**Précision de forme:**

rayon ± 0,005 (R0,1-R1,5)

rayon ± 0,010 (R2,0-R6,0)

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. no.<br>Réf. | Ø d<br>in mm | l<br>in mm | L<br>in mm | ØD<br>h6<br>in mm | R<br>in mm |
|------------------------------------|-------------------------------|--------------|------------|------------|-------------------|------------|
| 155415                             | M9701F.0020.002.038.03        | 0,2          | 0,2        | 38         | 3                 | 0,1        |
| 155416                             | M9701F.0020.004.038.03        | 0,2          | 0,4        | 38         | 3                 | 0,1        |
| 155418                             | M9701F.0030.003.038.03        | 0,3          | 0,3        | 38         | 3                 | 0,15       |
| 155419                             | M9701F.0030.006.038.03        | 0,3          | 0,6        | 38         | 3                 | 0,15       |
| 155420                             | M9701F.0040.004.038.03        | 0,4          | 0,4        | 38         | 3                 | 0,2        |
| 155421                             | M9701F.0040.008.038.03        | 0,4          | 0,8        | 38         | 3                 | 0,2        |
| 155422                             | M9701F.0040.015.038.03        | 0,4          | 1,5        | 38         | 3                 | 0,2        |
| 155423                             | M9701F.0050.005.038.03        | 0,5          | 0,5        | 38         | 3                 | 0,25       |
| 155424                             | M9701F.0050.010.038.03        | 0,5          | 1          | 38         | 3                 | 0,25       |
| 155425                             | M9701F.0050.015.038.03        | 0,5          | 1,5        | 38         | 3                 | 0,25       |
| 155426                             | M9701F.0060.006.038.03        | 0,6          | 0,6        | 38         | 3                 | 0,3        |
| 155427                             | M9701F.0060.012.038.03        | 0,6          | 1,2        | 38         | 3                 | 0,3        |
| 155428                             | M9701F.0060.020.038.03        | 0,6          | 2          | 38         | 3                 | 0,3        |
| 155429                             | M9701F.0070.007.038.03        | 0,7          | 0,7        | 38         | 3                 | 0,35       |
| 155430                             | M9701F.0070.014.038.03        | 0,7          | 1,4        | 38         | 3                 | 0,35       |
| 155431                             | M9701F.0070.030.038.03        | 0,7          | 3          | 38         | 3                 | 0,35       |
| 155432                             | M9701F.0080.008.038.03        | 0,8          | 0,8        | 38         | 3                 | 0,4        |
| 155433                             | M9701F.0080.016.038.03        | 0,8          | 1,6        | 38         | 3                 | 0,4        |
| 155434                             | M9701F.0080.030.038.03        | 0,8          | 3          | 38         | 3                 | 0,4        |
| 155435                             | M9701F.0090.009.038.03        | 0,9          | 0,9        | 38         | 3                 | 0,45       |
| 155436                             | M9701F.0090.018.038.03        | 0,9          | 1,8        | 38         | 3                 | 0,45       |
| 155437                             | M9701F.0100.010.038.03        | 1            | 1          | 38         | 3                 | 0,5        |
| 155440                             | M9701F.0100.020.038.03        | 1            | 2          | 38         | 3                 | 0,5        |
| 155441                             | M9701F.0100.030.038.03        | 1            | 3          | 38         | 3                 | 0,5        |
| 155442                             | M9701F.0100.040.038.03        | 1            | 4          | 38         | 3                 | 0,5        |
| 155443                             | M9701F.0120.024.038.03        | 1,2          | 2,4        | 38         | 3                 | 0,6        |
| 155444                             | M9701F.0120.036.038.03        | 1,2          | 3,6        | 38         | 3                 | 0,6        |
| 155445                             | M9701F.0140.028.038.03        | 1,4          | 2,8        | 38         | 3                 | 0,7        |
| 155446                             | M9701F.0140.042.038.03        | 1,4          | 4,2        | 38         | 3                 | 0,7        |
| 155447                             | M9701F.0150.030.038.03        | 1,5          | 3          | 38         | 3                 | 0,75       |



## System/Système M9701F

|                      |                      |                                        |                                        |                                      |                                      |                                    |                       |                        |                         |                 |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|
| <b>ALU</b><br><10%Si | <b>ALU</b><br>>10%Si | <b>STEEL</b><br><1000N/mm <sup>2</sup> | <b>STEEL</b><br>>1000N/mm <sup>2</sup> | <b>INOX</b><br><850N/mm <sup>2</sup> | <b>INOX</b><br>>850N/mm <sup>2</sup> | <b>Ti</b><br>>850N/mm <sup>2</sup> | <b>CAST</b><br>GGG/GG | <b>Cu(Zn)</b><br>Au/Ag | <b>CFRP</b><br>Graphite | <b>Plastics</b> |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

### VHM Mikro-Radiusfräser mit Zentrumsschnitt (RH/RC)

**TiAIN beschichtet**

2 Schneiden  
rechtsschneidend, ziehend

Drallwinkel: 30°

**Formgenauigkeit:**

Radius ± 0,005 (R0,1-R1,5)

Radius ± 0,010 (R2,0-R6,0)

### Solid carbide micro ball nose end mill with centre cut (RH/RC)

**TiAIN coated**

2 flutes  
right-hand cutting, up-cut

Helix angle: 30°

**Accuracy of shape:**

radius ± 0,005 (R0,1-R1,5)

radius ± 0,010 (R2,0-R6,0)

### Mini fraise hémisphérique en carbure avec coupe au centre (RH/RC)

**Revêtement: TiAIN**

2 dents  
coupe à droite, par cisailage  
oblique

Angle d'hélice: 30°

**Précision de forme:**

rayon ± 0,005 (R0,1-R1,5)

rayon ± 0,010 (R2,0-R6,0)

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Order Nr.<br>Réf. | Ø d<br>in mm | l<br>in mm | L<br>in mm | ØD<br>h6<br>in mm | R<br>in mm |
|------------------------------------|--------------------------------|--------------|------------|------------|-------------------|------------|
| 155448                             | M9701F.0150.045.038.03         | 1,5          | 4,5        | 38         | 3                 | 0,75       |
| 155449                             | M9701F.0160.032.038.03         | 1,6          | 3,2        | 38         | 3                 | 0,8        |
| 155450                             | M9701F.0160.048.038.03         | 1,6          | 4,8        | 38         | 3                 | 0,8        |
| 155635                             | M9701F.0180.036.038.03         | 1,8          | 3,6        | 38         | 3                 | 0,9        |
| 155636                             | M9701F.0180.054.038.03         | 1,8          | 5,4        | 38         | 3                 | 0,9        |
| 155637                             | M9701F.0200.040.038.04         | 2            | 4          | 38         | 4                 | 1          |
| 155638                             | M9701F.0200.060.038.03         | 2            | 6          | 38         | 3                 | 1          |
| 155639                             | M9701F.0200.060.038.06         | 2            | 6          | 38         | 6                 | 1          |
| 155640                             | M9701F.0250.050.038.06         | 2,5          | 5          | 38         | 6                 | 1,25       |
| 155641                             | M9701F.0250.075.038.06         | 2,5          | 7,5        | 38         | 6                 | 1,25       |
| 155642                             | M9701F.0300.060.038.06         | 3            | 6          | 38         | 6                 | 1,5        |
| 155643                             | M9701F.0300.080.038.03         | 3            | 8          | 38         | 3                 | 1,5        |
| 155644                             | M9701F.0300.120.040.03         | 3            | 12         | 40         | 3                 | 1,5        |
| 155645                             | M9701F.0300.250.060.03         | 3            | 25         | 60         | 3                 | 1,5        |
| 155646                             | M9701F.0400.080.045.06         | 4            | 8          | 45         | 6                 | 2          |
| 155647                             | M9701F.0400.120.045.04         | 4            | 12         | 45         | 4                 | 2          |
| 155648                             | M9701F.0500.080.050.06         | 5            | 8          | 50         | 6                 | 2,5        |
| 155649                             | M9701F.0600.100.050.06         | 6            | 10         | 50         | 6                 | 3          |
| 155650                             | M9701F.0600.160.050.06         | 6            | 16         | 50         | 6                 | 3          |
| 155651                             | M9701F.0800.160.050.08         | 8            | 16         | 50         | 8                 | 4          |
| 155652                             | M9701F.0800.350.075.08         | 8            | 35         | 75         | 8                 | 4          |
| 155653                             | M9701F.1000.220.070.10         | 10           | 22         | 70         | 10                | 5          |
| 155654                             | M9701F.1000.450.100.10         | 10           | 45         | 100        | 10                | 5          |
| 155655                             | M9701F.1200.220.070.12         | 12           | 22         | 70         | 12                | 6          |
| 155656                             | M9701F.1200.450.100.12         | 12           | 45         | 100        | 12                | 6          |

Oben aufgeführte Werkzeuge ab Lager lieferbar

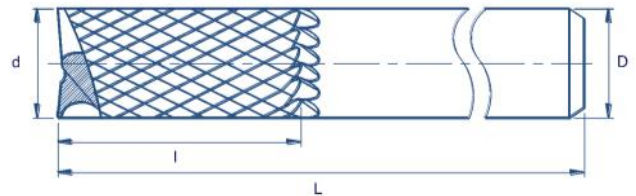
Tools listed above available from stock

Les outils susmentionnés sont en stock

Zwischenabmessungen kurzfristig lieferbar

Intermediate dimensions available at short notice

Dimensions intermédiaires livrables sous court délai



## System/Système M6401

|                          |                          |                                            |                                            |                                          |                                          |                                        |                           |                            |                             |                     |
|--------------------------|--------------------------|--------------------------------------------|--------------------------------------------|------------------------------------------|------------------------------------------|----------------------------------------|---------------------------|----------------------------|-----------------------------|---------------------|
| <b>ALU</b><br><10%Si<br> | <b>ALU</b><br>>10%Si<br> | <b>STEEL</b><br><1000N/mm <sup>2</sup><br> | <b>STEEL</b><br>>1000N/mm <sup>2</sup><br> | <b>INOX</b><br><850N/mm <sup>2</sup><br> | <b>INOX</b><br>>850N/mm <sup>2</sup><br> | <b>Ti</b><br>>850N/mm <sup>2</sup><br> | <b>CAST</b><br>GGG/GG<br> | <b>Cu(Zn)</b><br>Au/Ag<br> | <b>CFRP</b><br>Graphite<br> | <b>Plastics</b><br> |
|--------------------------|--------------------------|--------------------------------------------|--------------------------------------------|------------------------------------------|------------------------------------------|----------------------------------------|---------------------------|----------------------------|-----------------------------|---------------------|

- optimal geeignet / first choice / premier choix

- geeignet / suitable / approprié

- nicht geeignet / suitable / pas approprié

### VHM

#### Router CFK/GFK (RH/RC)

#### Verzahnung –fein-

Hochleistungs-  
Kreuzverzahnung  
rechtsschneidend, ziehend

Speziell für abrasive  
Materialien und  
faserverstärkte Kunststoffe

#### Solid carbide router CFRP (RH/RC)

#### Cut type -fine-

High performance criss-cross  
cutting  
right-hand cutting, up-cut

For machining abrasive  
materials and fibre-reinforced  
plastics

#### Fraise en carbure PRFC/PRFV (RH/RC)

#### Type denture -fine-

Denture croisée haute  
performance

Coupe à droite, par cisailage  
oblique

Pour l'usinage de matériaux  
abrasifs et de plastiques

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. no.<br>Réf. | Ø d<br>in mm | l<br>in mm | L<br>in mm | ØD<br>h6<br>in mm |  |
|------------------------------------|-------------------------------|--------------|------------|------------|-------------------|--|
| 155461                             | M6401.0300.060.040.03         | 3            | 6          | 40         | 3                 |  |
| 155462                             | M6401.0300.090.040.03         | 3            | 9          | 40         | 3                 |  |
| 155463                             | M6401.0300.120.040.03         | 3            | 12         | 40         | 3                 |  |
| 155465                             | M6401.0300.120.050.06         | 3            | 16         | 50         | 3                 |  |
| 155464                             | M6401.0300.160.050.03         | 3            | 12         | 50         | 6                 |  |
| 155466                             | M6401.0300.160.050.06         | 3            | 16         | 50         | 6                 |  |
| 155467                             | M6401.0400.060.040.04         | 4            | 6          | 40         | 4                 |  |
| 155468                             | M6401.0400.100.040.04         | 4            | 10         | 40         | 4                 |  |
| 155472                             | M6401.0400.120.050.06         | 4            | 14         | 50         | 4                 |  |
| 155469                             | M6401.0400.140.050.04         | 4            | 18         | 50         | 4                 |  |
| 155473                             | M6401.0400.160.050.06         | 4            | 22         | 60         | 4                 |  |
| 155470                             | M6401.0400.180.050.04         | 4            | 12         | 50         | 6                 |  |
| 155471                             | M6401.0400.220.060.04         | 4            | 16         | 50         | 6                 |  |
| 155475                             | M6401.0500.140.050.06         | 5            | 16         | 60         | 5                 |  |
| 155474                             | M6401.0500.160.060.05         | 5            | 14         | 50         | 6                 |  |
| 155476                             | M6401.0500.220.060.06         | 5            | 22         | 60         | 6                 |  |
| 155477                             | M6401.0600.140.050.06         | 6            | 14         | 50         | 6                 |  |
| 155478                             | M6401.0600.220.060.06         | 6            | 22         | 60         | 6                 |  |
| 155479                             | M6401.0600.320.070.06         | 6            | 32         | 70         | 6                 |  |
| 155480                             | M6401.0800.220.060.08         | 8            | 22         | 60         | 8                 |  |
| 155481                             | M6401.0800.320.075.08         | 8            | 32         | 75         | 8                 |  |
| 155482                             | M6401.1000.320.075.10         | 10           | 32         | 75         | 10                |  |

Oben aufgeführte Werkzeuge ab Lager lieferbar

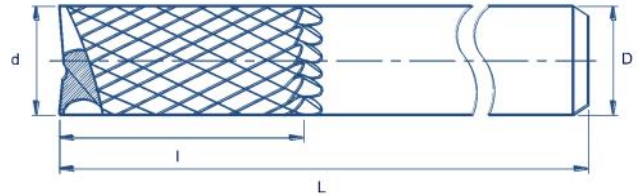
Tools listed above available from stock

Les outils susmentionnés sont en stock

Zwischenabmessungen kurzfristig lieferbar

Intermediate dimensions available at short notice

Dimensions intermédiaires livrables sous court délai



## System/Système M6391

|                          |                          |                                            |                                            |                                          |                                          |                                        |                           |                            |                             |                     |
|--------------------------|--------------------------|--------------------------------------------|--------------------------------------------|------------------------------------------|------------------------------------------|----------------------------------------|---------------------------|----------------------------|-----------------------------|---------------------|
| <b>ALU</b><br><10%Si<br> | <b>ALU</b><br>>10%Si<br> | <b>STEEL</b><br><1000N/mm <sup>2</sup><br> | <b>STEEL</b><br>>1000N/mm <sup>2</sup><br> | <b>INOX</b><br><850N/mm <sup>2</sup><br> | <b>INOX</b><br>>850N/mm <sup>2</sup><br> | <b>Ti</b><br>>850N/mm <sup>2</sup><br> | <b>CAST</b><br>GGG/GG<br> | <b>Cu(Zn)</b><br>Au/Ag<br> | <b>CFRP</b><br>Graphite<br> | <b>Plastics</b><br> |
|--------------------------|--------------------------|--------------------------------------------|--------------------------------------------|------------------------------------------|------------------------------------------|----------------------------------------|---------------------------|----------------------------|-----------------------------|---------------------|

- optimal geeignet / first choice / premier choix

- geeignet / suitable / approprié

- nicht geeignet / suitable / pas approprié

### VHM Router CFK/GFK (RH/RC)

#### Verzahnung –mittel-

Hochleistungs-  
Kreuzverzahnung  
rechtsschneidend, ziehend  
  
Speziell für abrasive  
Materialien und  
faserverstärkte Kunststoffe

### Solid carbide router CFRP (RH/RC)

#### Cut type –medium-

High performance criss-cross  
cutting  
right-hand cutting, up-cut  
  
For machining abrasive  
materials and fibre-reinforced  
plastics

### Fraise en carbure PRFC/PRFV (RH/RC)

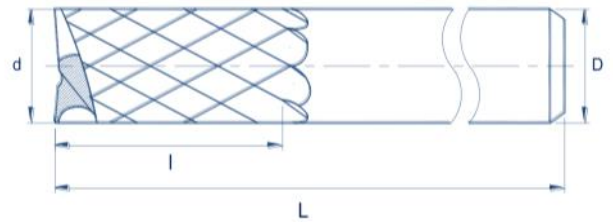
#### Type denture –moyenne-

Denture croisée haute  
performance  
  
Coupe à droite, par cisailage  
oblique  
  
Pour l'usinage de matériaux  
abrasifs et de plastiques

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. no..<br>Réf. | Ø d<br>in mm | l<br>in mm | L<br>in mm | ØD<br>h6<br>in mm |  |
|------------------------------------|--------------------------------|--------------|------------|------------|-------------------|--|
| 155504                             | M6391.0300.060.040.03          | 3            | 6          | 40         | 3                 |  |
| 155506                             | M6391.0300.090.040.03          | 3            | 9          | 40         | 3                 |  |
| 155507                             | M6391.0300.120.040.03          | 3            | 12         | 40         | 3                 |  |
| 155509                             | M6391.0300.120.050.06          | 3            | 16         | 50         | 3                 |  |
| 155508                             | M6391.0300.160.050.03          | 3            | 12         | 50         | 6                 |  |
| 155510                             | M6391.0300.160.050.06          | 3            | 16         | 50         | 6                 |  |
| 155511                             | M6391.0400.060.040.04          | 4            | 6          | 40         | 4                 |  |
| 155512                             | M6391.0400.100.040.04          | 4            | 10         | 40         | 4                 |  |
| 155517                             | M6391.0400.120.050.06          | 4            | 14         | 50         | 4                 |  |
| 155513                             | M6391.0400.140.050.04          | 4            | 18         | 50         | 4                 |  |
| 155518                             | M6391.0400.160.050.06          | 4            | 22         | 60         | 4                 |  |
| 155515                             | M6391.0400.180.050.04          | 4            | 12         | 50         | 6                 |  |
| 155516                             | M6391.0400.220.060.04          | 4            | 16         | 50         | 6                 |  |
| 155520                             | M6391.0500.140.050.06          | 5            | 16         | 60         | 5                 |  |
| 155519                             | M6391.0500.160.060.05          | 5            | 14         | 50         | 6                 |  |
| 155521                             | M6391.0500.220.060.06          | 5            | 22         | 60         | 6                 |  |
| 155522                             | M6391.0600.140.050.06          | 6            | 14         | 50         | 6                 |  |
| 155523                             | M6391.0600.220.060.06          | 6            | 22         | 60         | 6                 |  |
| 155524                             | M6391.0600.320.070.06          | 6            | 32         | 70         | 6                 |  |
| 155525                             | M6391.0800.220.060.08          | 8            | 22         | 60         | 8                 |  |
| 155526                             | M6391.0800.320.075.08          | 8            | 32         | 75         | 8                 |  |
| 155527                             | M6391.1000.320.075.10          | 10           | 32         | 75         | 10                |  |

Oben aufgeführte Werkzeuge ab Lager lieferbar  
Tools listed above available from stock  
Les outils susmentionnés sont en stock

Zwischenabmessungen kurzfristig lieferbar  
Intermediate dimensions available at short notice  
Dimensions intermédiaires livrables sous court délai



## System/Système M6381

|                      |                      |                                        |                                        |                                      |                                      |                                    |                       |                        |                         |                 |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|
| <b>ALU</b><br><10%Si | <b>ALU</b><br>>10%Si | <b>STEEL</b><br><1000N/mm <sup>2</sup> | <b>STEEL</b><br>>1000N/mm <sup>2</sup> | <b>INOX</b><br><850N/mm <sup>2</sup> | <b>INOX</b><br>>850N/mm <sup>2</sup> | <b>Ti</b><br>>850N/mm <sup>2</sup> | <b>CAST</b><br>GGG/GG | <b>Cu(Zn)</b><br>Au/Ag | <b>CFRP</b><br>Graphite | <b>Plastics</b> |
|----------------------|----------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|------------------------------------|-----------------------|------------------------|-------------------------|-----------------|

● - optimal geeignet / first choice / premier choix

● - geeignet / suitable / approprié

● - nicht geeignet / suitable / pas approprié

### VHM-Router CFK/GFK (RH/RC)

#### Verzahnung –grob-

Hochleistungs-Kreuzverzahnung rechtsschneidend, ziehend  
Speziell für abrasive Materialien und faserverstärkte Kunststoffe

### Solid carbide router CFRP (RH/RC)

#### Cut type –coarse-

High performance criss-cross cutting right-hand cutting, up-cut  
For machining abrasive materials and fibre-reinforced plastics

### Fraise en carbure PRFC/PRFV (RH/RC)

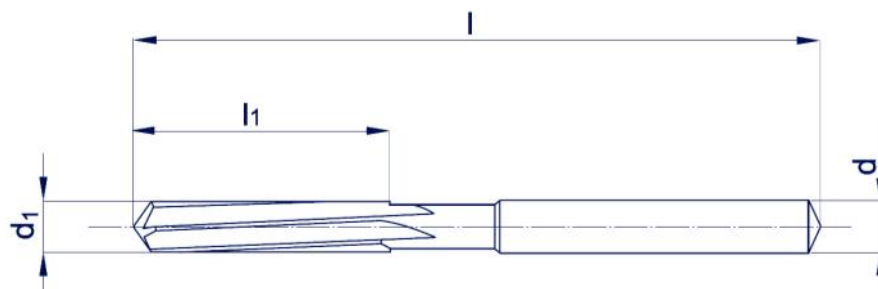
#### Type –grosnière-

Denture croisée haute performance  
Coupe à droite, par cisailage oblique  
Pour l'usinage de matériaux abrasifs et de plastiques renforcés de fibres

| Art. Nr.<br>Item no.<br>No. d'art. | Best. Nr.<br>Ref. no<br>Réf. | Ø d<br>in mm | l<br>in mm | L<br>in mm | ØD<br>h6<br>in mm |  |
|------------------------------------|------------------------------|--------------|------------|------------|-------------------|--|
| 155528                             | M6381.0300.060.040.03        | 3            | 6          | 40         | 3                 |  |
| 155529                             | M6381.0300.090.040.03        | 3            | 9          | 40         | 3                 |  |
| 155530                             | M6381.0300.120.040.03        | 3            | 12         | 40         | 3                 |  |
| 155532                             | M6381.0300.120.050.06        | 3            | 16         | 50         | 3                 |  |
| 155531                             | M6381.0300.160.050.03        | 3            | 12         | 50         | 6                 |  |
| 155533                             | M6381.0300.160.050.06        | 3            | 16         | 50         | 6                 |  |
| 155534                             | M6381.0400.060.040.04        | 4            | 6          | 40         | 4                 |  |
| 155535                             | M6381.0400.100.040.04        | 4            | 10         | 40         | 4                 |  |
| 155539                             | M6381.0400.120.050.06        | 4            | 14         | 50         | 4                 |  |
| 155536                             | M6381.0400.140.050.04        | 4            | 18         | 50         | 4                 |  |
| 155540                             | M6381.0400.160.050.06        | 4            | 22         | 60         | 4                 |  |
| 155537                             | M6381.0400.180.050.04        | 4            | 12         | 50         | 6                 |  |
| 155538                             | M6381.0400.220.060.04        | 4            | 16         | 50         | 6                 |  |
| 155543                             | M6381.0500.140.050.06        | 5            | 16         | 60         | 5                 |  |
| 155541                             | M6381.0500.160.060.05        | 5            | 14         | 50         | 6                 |  |
| 155545                             | M6381.0500.220.060.06        | 5            | 22         | 60         | 6                 |  |
| 155546                             | M6381.0600.140.050.06        | 6            | 14         | 50         | 6                 |  |
| 155547                             | M6381.0600.220.060.06        | 6            | 22         | 60         | 6                 |  |
| 155548                             | M6381.0600.320.070.06        | 6            | 32         | 70         | 6                 |  |
| 155549                             | M6381.0800.220.060.08        | 8            | 22         | 60         | 8                 |  |
| 155550                             | M6381.0800.320.075.08        | 8            | 32         | 75         | 8                 |  |
| 155551                             | M6381.1000.320.075.10        | 10           | 32         | 75         | 10                |  |

Oben aufgeführte Werkzeuge ab Lager lieferbar  
Tools listed above available from stock  
Les outils susmentionnés sont en stock

Zwischenabmessungen kurzfristig lieferbar  
Intermediate dimensions available at short notice  
Dimensions intermédiaires livrables sous court délai



## System/Système R00

### VHM-Reibahlen mit Zylinderschaft

Baumaße nach DIN 212

Schnitttrichtung: rechts mit Linksdrill (LH/RC)

Alle Abmessungen ab Lager oder kurzfristig lieferbar

### Solid carbide reamers with cylindrical shank

Dimensions as per DIN 212

Cutting: right-hand with left-hand helix angle LH/RC

All dimensions available from stock or at short notice

### Aléssoirs en carbure avec queue cylindrique

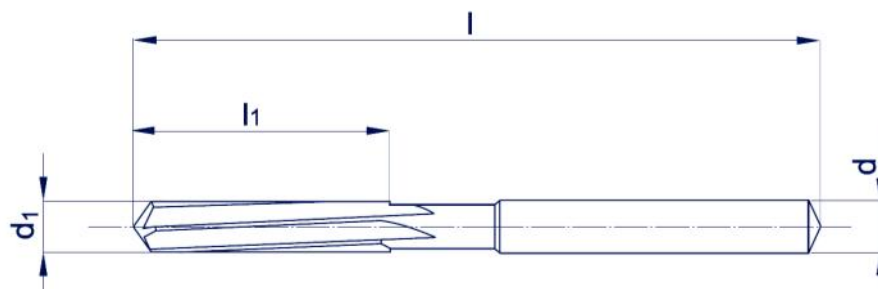
Dimensions selon DIN 212

Exécution:

coupe à droite et hélice à gauche (LH/RC)

Toutes dimensions en stock, ou livrable rapidement

| Best. Nr.<br>Ref. no.<br>Réf. | Ø d1<br>H7<br>in mm | L1<br>in mm | Ød<br>h7<br>in mm | L<br>in mm | Zähne<br>teeth<br>dents |
|-------------------------------|---------------------|-------------|-------------------|------------|-------------------------|
| R00.0030 - .0047              | 0,30- 0,47          | 5           | 1,5               | 35         | 4                       |
| R00.0048 - .0053              | 0,48- 0,53          | 5           | 1,5               | 35         | 4                       |
| R00.0054 - .0059              | 0,54- 0,59          | 5           | 1,5               | 35         | 4                       |
| R00.0060 - .0069              | 0,60- 0,69          | 6           | 1,5               | 35         | 4                       |
| R00.0070 - .0079              | 0,70- 0,79          | 6           | 1,5               | 35         | 4                       |
| R00.0080 - .0090              | 0,80- 0,90          | 6           | 1,5               | 35         | 4                       |
| R00.0091 - .0100              | 0,91- 1,00          | 8           | 1,5               | 35         | 4                       |
| R00.0101 - .0120              | 1,01- 1,20          | 10          | 1,5               | 35         | 4                       |
| R00.0121 - .0150              | 1,21- 1,50          | 12          | 1,5               | 40         | 4                       |
| R00.0151 - .0200              | 1,51- 2,00          | 16          | 2,0               | 45         | 4                       |
| R00.0201 - .0240              | 2,01- 2,40          | 18          | 2,0               | 50         | 4                       |
| R00.0201 - .0240              | 2,01- 2,40          | 18          | 3,0               | 50         | 4                       |
| R00.0241 - .0270              | 2,41- 2,70          | 20          | 3,0               | 55         | 4                       |
| R00.0271 - .0310              | 2,71- 3,10          | 20          | 3,0               | 60         | 4 - 6                   |
| R00.0311 - .0370              | 3,11- 3,70          | 22          | 4,0               | 60         | 6                       |
| R00.0371 - .0410              | 3,71- 4,10          | 24          | 4,0               | 65         | 6                       |
| R00.0411 - .0460              | 4,11- 4,60          | 24          | 5,0               | 65         | 6                       |
| R00.0461 - .0490              | 4,61- 4,90          | 26          | 5,0               | 65         | 6                       |
| R00.0491 - .0520              | 4,91- 5,20          | 26          | 5,0               | 75         | 6                       |
| R00.0521 - .0570              | 5,21- 5,70          | 26          | 5,0               | 75         | 6                       |
| R00.0571 - .0620              | 5,71- 6,20          | 26          | 5,0               | 75         | 6                       |
| R00.0571 - .0620              | 5,71- 6,20          | 26          | 6,0               | 75         | 6                       |
| R00.0621 - .0660              | 6,21- 6,60          | 30          | 6,0               | 80         | 6                       |
| R00.0661 - .0690              | 6,61- 6,90          | 30          | 6,0               | 80         | 6                       |
| R00.0661 - .0690              | 6,61- 6,90          | 30          | 7,0               | 80         | 6                       |
| R00.0691 - .0720              | 6,91- 7,20          | 35          | 7,0               | 95         | 6                       |
| R00.0721 - .0770              | 7,21- 7,70          | 35          | 7,0               | 95         | 6                       |
| R00.0771 - .0820              | 7,71- 8,20          | 35          | 7,0               | 95         | 6                       |
| R00.0771 - .0820              | 7,71- 8,20          | 35          | 8,0               | 95         | 6                       |
| R00.0821 - .0870              | 8,21- 8,70          | 35          | 8,0               | 100        | 6                       |



## System/Systeme R00

### VHM-Reibahlen mit Zylinderschaft

Baumaße nach DIN 212

Schnitttrichtung: rechts mit Linksdrill (LH/RC)

Alle Abmessungen ab Lager oder kurzfristig lieferbar

### Solid carbide reamers with cylindrical shank

Dimensions as per DIN 212

Cutting: right-hand with left-hand helix angle (LH/RC)

All dimensions available from stock or at short notice

### Aléssoirs en carbure avec queue cylindrique

Dimensions selon DIN 212

Exécution:

coupe à droite avec hélice à gauche (LH/RC)

Toutes dimensions en stock, ou livrable rapidement

| Best. Nr.<br>Ref. no.<br>Réf. | Ø d1<br>H7<br>in mm | l 1<br>in mm | Ød<br>h7<br>in mm | L<br>in mm | Zähne<br>teeth<br>dents |
|-------------------------------|---------------------|--------------|-------------------|------------|-------------------------|
| R00.0871 - .0890              | 8,71- 8,90          | 35           | 8,0               | 100        | 6                       |
| R00.0871 - .0890              | 8,71- 8,90          | 35           | 9,0               | 100        | 6                       |
| R00.0891 - .0920              | 8,91- 9,20          | 35           | 9,0               | 100        | 6                       |
| R00.0921 - .0970              | 9,21- 9,70          | 35           | 9,0               | 100        | 6                       |
| R00.0971 - .0990              | 9,71- 9,90          | 35           | 9,0               | 100        | 6                       |
| R00.0971 - .0990              | 9,71- 9,90          | 35           | 10,0              | 100        | 6                       |
| R00.0991 - .1070              | 9,91- 10,70         | 35           | 10,0              | 100        | 6                       |
| R00.1071 - .1090              | 10,71- 10,90        | 35           | 10,0              | 100        | 6                       |
| R00.1071 - .1090              | 10,71- 10,90        | 35           | 11,0              | 100        | 6                       |
| R00.1091 - .1120              | 10,91- 11,20        | 35           | 11,0              | 100        | 6                       |
| R00.1121 - .1170              | 11,21- 11,70        | 35           | 11,0              | 100        | 6                       |
| R00.1171 - .1190              | 11,71- 11,90        | 35           | 11,0              | 100        | 6                       |
| R00.1171 - .1190              | 11,71- 11,90        | 35           | 12,0              | 100        | 6                       |
| R00.1191 - .1260              | 11,91- 12,60        | 35           | 12,0              | 100        | 6                       |
| R00.1261 - .1290              | 12,61- 12,90        | 35           | 12,0              | 100        | 6                       |
| R00.1261 - .1290              | 12,61- 12,90        | 35           | 13,0              | 100        | 6                       |
| R00.1291 - .1352              | 12,91- 13,52        | 35           | 13,0              | 100        | 6                       |
| R00.1390 - .1410              | 13,90- 14,10        | 35           | 14,0              | 100        | 6                       |
| R00.1490 - .1510              | 14,90- 15,10        | 35           | 14,0              | 100        | 6                       |
| R00.1590 - .1610              | 15,90- 16,10        | 35           | 16,0              | 100        | 6                       |
| R00.1790 - .1810              | 17,90- 18,10        | 35           | 18,0              | 100        | 6                       |

Oben aufgeführte Werkzeuge ab Lager lieferbar

Tools listed above available from stock

Les outils susmentionnés sont en stock

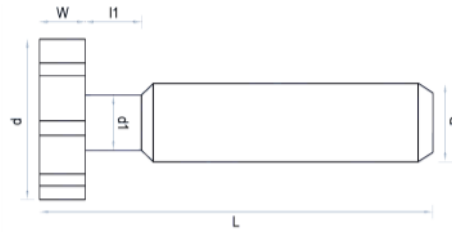
Zwischenabmessungen kurzfristig lieferbar

Intermediate dimensions available at short notice

Dimensions intermédiaires livrables sous court délai

# System/Système M4011

## Art.Nr. 158175



|                                                                                                 |                                                                                                                |                                                                                                                |                                                                                                  |                                                                                                     |                                                                                                               |                                                                                                      |                                                                                                                |                                                                                                        |
|-------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| <b>ALU</b><br> | <b>STEEL</b><br><700N/mm²<br> | <b>STEEL</b><br>>700N/mm²<br> | <b>INOX</b><br> | <b>Au/Ag</b><br> | <b>Ti</b><br>>850N/mm²<br> | <b>Cu(Zn)</b><br> | <b>CFRP</b><br>Graphite<br> | <b>Plastics</b><br> |
| <b>ALU</b><br> | <b>STEEL</b><br><700N/mm²<br> | <b>STEEL</b><br>>700N/mm²<br> | <b>INOX</b><br> | <b>Au/Ag</b><br> | <b>Ti</b><br>>850N/mm²<br> | <b>Cu(Zn)</b><br> | <b>CFRP</b><br>Graphite<br> | <b>Plastics</b><br> |

● - optimal geeignet / first choice / premier choix      ● - geeignet / suitable / approprié      ● - nicht geeignet / suitable / pas approprié

### VHM

#### T-Nut Fräser mit gerader Verzahnung

Rechtsschneidend  
Zwischenabmessungen  
auf Anfrage  
Linksschneidend  
auf Anfrage

### Solid carbide

#### T-Slot cutter straight teeth

Right-hand cutting  
Intermediate dimensions  
on request  
Left-hand cutting  
on request

### Fraise en carbure pour rainure en T avec denture plane

Coupe à droite  
Dimensions intermédiaires  
sur demande  
Coupe à gauche  
sur demande

| d<br>mm | W<br>mm | L<br>mm | D<br>h6<br>mm | d1<br>+0/0,5<br>mm | L1<br>±0,02<br>mm | Z<br>Gold | Z<br>Inox | Z<br>Brass |
|---------|---------|---------|---------------|--------------------|-------------------|-----------|-----------|------------|
| 2,0     | 0,2-1,0 | 38      | 4             | 1,0                | 2,0               | 3         | 5         | 6          |
| 3,0     | 0,2-1,5 | 38      | 4             | 1,5                | 2,0               | 3         | 5         | 6          |
| 4,0     | 0,2-1,5 | 38      | 4             | 2,5                | 3,0               | 3         | 5         | 6          |
| 5,0     | 0,5-1,5 | 38      | 5             | 3,0                | 3,0               | 3         | 5         | 6          |
| 6,0     | 0,5-2,5 | 38      | 6             | 3,5                | 4,0               | 4         | 6         | 8          |
| 8,0     | 0,5-3,0 | 51      | 8             | 4,0                | 5,0               | 4-5       | 8         | 10         |
| 10,0    | 0,5-4,0 | 51      | 10            | 5,0                | 5,0               | 4-5       | 10        | 12         |
| 12,0    | 0,5-4,0 | 51      | 10            | 6,0                | 6,0               | 5-6       | 12-14     | 16         |
| 15,0    | 0,5-5,0 | 61      | 10            | 8,0                | 8,0               | 5-8       | 14-16     | 18         |
| 16,0    | 0,5-2,9 | 61      | 10            | 8,0                | 8,0               | 5-8       | 16-18     | 20         |
| 16,0    | 3,0-6,0 | 61      | 10            | 8,0                | 8,0               | 5-8       | 16-18     | 20         |
|         |         |         |               |                    |                   |           |           |            |
|         |         |         |               |                    |                   |           |           |            |

Z=Zähne / teeth / dents

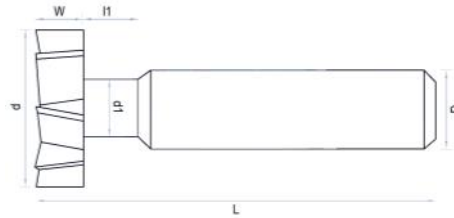
Siehe Bestellblatt Seite 74

See order sheet page 74

Reportez-vous à la page de commande 74

# System/Système M4021

## Art.Nr. 158176



|                                                          |                 |                                |                                |                  |                   |                             |                    |                              |                      |
|----------------------------------------------------------|-----------------|--------------------------------|--------------------------------|------------------|-------------------|-----------------------------|--------------------|------------------------------|----------------------|
|                                                          | <b>ALU</b><br>● | <b>STEEL</b><br><700N/mm²<br>● | <b>STEEL</b><br>>700N/mm²<br>● | <b>INOX</b><br>● | <b>Au/Ag</b><br>● | <b>Ti</b><br>>850N/mm²<br>● | <b>Cu(Zn)</b><br>● | <b>CFRP</b><br>Graphite<br>● | <b>Plastics</b><br>● |
| <b>Beschichtet</b><br><b>Coated</b><br><b>Revêtement</b> | <b>ALU</b><br>● | <b>STEEL</b><br><700N/mm²<br>● | <b>STEEL</b><br>>700N/mm²<br>● | <b>INOX</b><br>● | <b>Au/Ag</b><br>● | <b>Ti</b><br>>850N/mm²<br>● | <b>Cu(Zn)</b><br>● | <b>CFRP</b><br>Graphite<br>● | <b>Plastics</b><br>● |

● - optimal geeignet / first choice / premier choix      ● - geeignet / suitable / approprié      ● - nicht geeignet / suitable / pas approprié

### VHM T-Nut Fräser schrägverzahnt

Rechtsschneidend  
Zwischenabmessungen  
auf Anfrage  
Linksschneidend  
auf Anfrage

### Solid carbide T-Slot cutter staggered teeth

Right-hand cutting  
Intermediate dimensions  
on request  
Left-hand cutting  
on request

### Fraise en carbure pour rainure en T avec denture hélicoïdale

Coupe à droite  
Dimensions intermédiaires  
sur demande  
Coupe à gauche  
sur demande

| d<br>mm | W<br>mm | L<br>mm | D<br>h6<br>mm | d1<br>+0/0,5<br>mm | l1<br>±0,02<br>mm | Z<br>Au/Ag | Z<br>Inox | Z<br>Cu(Zn) |
|---------|---------|---------|---------------|--------------------|-------------------|------------|-----------|-------------|
| 4,0     | 0,5-3,0 | 38      | 4             | 2,5                | 3,0               | 4          | 6         | 6           |
| 5,0     | 0,5-3,0 | 38      | 5             | 3,0                | 3,0               | 4          | 6         | 6           |
| 6,0     | 0,5-3,0 | 38      | 6             | 3,5                | 4,0               | 4          | 6         | 6           |
| 8,0     | 1,0-4,0 | 51      | 8             | 4,0                | 5,0               | 4          | 6-8       | 8-10        |
| 10,0    | 1,0-4,0 | 51      | 10            | 5,0                | 5,0               | 4-6        | 8-10      | 10-12       |
| 12,0    | 1,0-5,0 | 51      | 10            | 6,0                | 6,0               | 4-6        | 8-10      | 12          |
| 15,0    | 1,5-6,0 | 61      | 10            | 8,0                | 8,0               | 6-8        | 12-14     | 16          |
| 16,0    | 1,5-3,9 | 61      | 10            | 8,0                | 8,0               | 6-8        | 12-14     | 16          |
| 16,0    | 4,0-6   | 61      | 10            | 8,0                | 8,0               | 6-8        | 12-14     | 16          |
|         |         |         |               |                    |                   |            |           |             |
|         |         |         |               |                    |                   |            |           |             |
|         |         |         |               |                    |                   |            |           |             |
|         |         |         |               |                    |                   |            |           |             |

Z=Zähne / teeth / dents

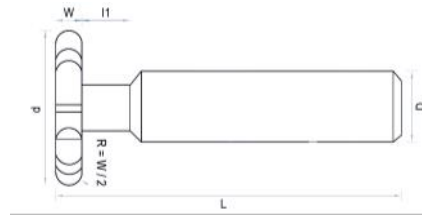
Siehe Bestellblatt Seite 74

See order sheet page 74

Reportez-vous à la page de commande 74

# System/Système M4031

## Art.Nr. 158177



|                                                          |                 |                                |                                |                  |                   |                             |                    |                              |                      |
|----------------------------------------------------------|-----------------|--------------------------------|--------------------------------|------------------|-------------------|-----------------------------|--------------------|------------------------------|----------------------|
|                                                          | <b>ALU</b><br>● | <b>STEEL</b><br><700N/mm²<br>● | <b>STEEL</b><br>>700N/mm²<br>● | <b>INOX</b><br>● | <b>Au/Ag</b><br>● | <b>Ti</b><br>>850N/mm²<br>● | <b>Cu(Zn)</b><br>● | <b>CFRP</b><br>Graphite<br>● | <b>Plastics</b><br>● |
| <b>Beschichtet</b><br><b>Coated</b><br><b>Revêtement</b> | <b>ALU</b><br>● | <b>STEEL</b><br><700N/mm²<br>● | <b>STEEL</b><br>>700N/mm²<br>● | <b>INOX</b><br>● | <b>Au/Ag</b><br>● | <b>Ti</b><br>>850N/mm²<br>● | <b>Cu(Zn)</b><br>● | <b>CFRP</b><br>Graphite<br>● | <b>Plastics</b><br>● |

● - optimal geeignet / first choice / premier choix      ● - geeignet / suitable / approprié      ● - nicht geeignet / suitable / pas approprié

### VHM T-Nut Fräser mit konvexem Radius

Rechtsschneidend  
Zwischenabmessungen  
auf Anfrage  
Linksschneidend  
auf Anfrage

### Solid carbide T-Slot cutter convex radius

Right-hand cutting  
Intermediate dimensions  
on request  
Left-hand cutting  
on request

### Fraise en carbure pour rainure en T à rayon convexe

Coupe à droite  
Dimensions intermédiaires  
sur demande  
Coupe à gauche  
sur demande

| d<br>mm | W<br>mm | L<br>mm | D<br>h6<br>mm | d1<br>+0/0,5<br>mm | l1<br>±0,02<br>mm | Z  |
|---------|---------|---------|---------------|--------------------|-------------------|----|
| 4,0     | 0,4-1,5 | 38      | 4             | 1,5                | 3,0               | 4  |
| 6,0     | 0,5-2,0 | 38      | 6             | 3,0                | 3,5               | 6  |
| 8,0     | 1,0-3,0 | 51      | 6             | 4,0                | 4,0               | 6  |
| 10,0    | 1,0-4,0 | 51      | 8             | 5,0                | 5,0               | 8  |
| 12,0    | 1,0-5,0 | 51      | 10            | 6,0                | 5,0               | 10 |
| 16,0    | 1,0-6,0 | 61      | 12            | 8,0                | 6,0               | 12 |
|         |         |         |               |                    |                   |    |
|         |         |         |               |                    |                   |    |
|         |         |         |               |                    |                   |    |
|         |         |         |               |                    |                   |    |
|         |         |         |               |                    |                   |    |
|         |         |         |               |                    |                   |    |
|         |         |         |               |                    |                   |    |
|         |         |         |               |                    |                   |    |

Z=Zähne / teeth / dents

Siehe Bestellblatt Seite 74

See order sheet page 74

Reportez-vous à la page de commande 74

# Bestellblatt / Order sheet page / Page de commande

**System/Système  
M4011  
=Art.Nr. 158175=**

VHM T-Nut Fräser mit gerader Verzahnung

Solid carbide T-Slot cutter straight teeth

Fraise en carbure pour rainure en T avec denture plane

Z=Zähne / teeth / dents

**System/Système  
M4021  
=Art.Nr. 158176=**

VHM T-Nut Fräser schrägverzahnt

Solid carbide T-Slot cutter staggered teeth

Fraise en carbure pour rainure en T avec denture hélicoïdale

Z=Zähne / teeth / dents

**System/Système  
M4031  
=Art.Nr. 158177=**

VHM T-Nut Fräser mit konvexem Radius

Solid carbide T-Slot cutter convex radius

Fraise en carbure pour rainure en T à rayon convexe

Z=Zähne / teeth / dents

| Pos. | Art.Nr.<br>(Syst.) | d<br>mm | d1<br>mm | W<br>mm | l1<br>mm | D<br>mm | L<br>mm | Z | Beschichtung<br>Coating<br>Revêtement | Bearb. Material<br>Raw-Material<br>Matière première | Stückzahl<br>number of pieces<br>nombre de pièces |
|------|--------------------|---------|----------|---------|----------|---------|---------|---|---------------------------------------|-----------------------------------------------------|---------------------------------------------------|
| 01   |                    |         |          |         |          |         |         |   |                                       |                                                     |                                                   |
| 02   |                    |         |          |         |          |         |         |   |                                       |                                                     |                                                   |
| 03   |                    |         |          |         |          |         |         |   |                                       |                                                     |                                                   |
| 04   |                    |         |          |         |          |         |         |   |                                       |                                                     |                                                   |
| 05   |                    |         |          |         |          |         |         |   |                                       |                                                     |                                                   |
| 06   |                    |         |          |         |          |         |         |   |                                       |                                                     |                                                   |
| 07   |                    |         |          |         |          |         |         |   |                                       |                                                     |                                                   |

Name / name / nom:  
Firma / company / entreprise:  
Tel.:  
Fax:  
E-mail.:

Anschrift/address/adresse:



## Spiralbohrer / twist drills / forets hélicoïdals

| Werkstoffe<br>Materials<br>Matériaux                                                                                                                                                        | Vc<br>in m/min. | Vorschub f (mm/Umdrehung)<br>Infeed f (mm/revolution)<br>Avance f (mm/révolution) |                |                |                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------------------------------------------------------------------------------|----------------|----------------|----------------|
|                                                                                                                                                                                             |                 | Ø0,5-Ø1,0                                                                         | Ø1,0-Ø1,5      | Ø1,6-Ø2,0      | Ø2,1-Ø3,0      |
| Stähle 800-1000 N/mm <sup>2</sup><br>Steels 800-1000 N/mm <sup>2</sup><br>Aciers 800-1000 N/mm <sup>2</sup>                                                                                 | 5-130           | 0,003<br>0,010                                                                    | 0,008<br>0,030 | 0,025<br>0,050 | 0,045<br>0,120 |
| Stähle 1000-1450 N/mm <sup>2</sup><br>Steels 1000-1450 N/mm <sup>2</sup><br>Aciers 1000-1450 N/mm <sup>2</sup>                                                                              | 5-100           | 0,002<br>0,008                                                                    | 0,007<br>0,020 | 0,015<br>0,040 | 0,035<br>0,100 |
| Grauguss < 180 HB<br>Cast iron < 180 HB<br>Fonte grise < 180 HB                                                                                                                             | 5-120           | 0,004<br>0,016                                                                    | 0,015<br>0,030 | 0,030<br>0,080 | 0,075<br>0,140 |
| Grauguss > 180 HB<br>Cast iron > 180 HB<br>Fonte grise > 180 HB                                                                                                                             | 4-100           | 0,004<br>0,016                                                                    | 0,010<br>0,020 | 0,015<br>0,060 | 0,055<br>0,120 |
| Aluminiumlegierungen < 13% Si<br>Aluminium alloy < 13% Si<br>Alliages d'aluminium < 13% Si                                                                                                  | 8-170           | 0,004<br>0,012                                                                    | 0,010<br>0,012 | 0,050<br>0,090 | 0,080<br>0,180 |
| Aluminiumlegierungen > 13% Si<br>Aluminium alloy > 13% Si<br>Alliages d'aluminium > 13% Si                                                                                                  | 4-120           | 0,002<br>0,018                                                                    | 0,015<br>0,045 | 0,040<br>0,080 | 0,070<br>0,160 |
| Kupfer<br>Copper<br>Cuivre                                                                                                                                                                  | 5-75            | 0,003<br>0,020                                                                    | 0,015<br>0,040 | 0,003<br>0,060 | 0,050<br>0,100 |
| Titanlegierungen<br>Titanium alloy<br>Alliages de titanum                                                                                                                                   | 5-60            | 0,003<br>0,020                                                                    | 0,015<br>0,040 | 0,003<br>0,060 | 0,050<br>0,100 |
| Rostfreie Stähle<br>Stainless steel<br>Aciers inoxydables                                                                                                                                   | 4-120           | 0,002<br>0,006                                                                    | 0,005<br>0,016 | 0,015<br>0,040 | 0,035<br>0,080 |
| Hochwarmfeste Stähle<br>Cr/Ni-Legierungen (Nimonic, Inconel)<br>highly heat resistant steels<br>Cr/Ni-alloys (Nimonic, Inconel)<br>Aciers réfractaires<br>Alliages Cr/Ni (Nimonic, Inconel) | 5-20            | 0,003<br>0,020                                                                    | 0,015<br>0,030 | 0,020<br>0,040 | 0,030<br>0,050 |

\* \_ Die angegebenen Arbeitswerte sind Richtwerte.  
Die für den jeweiligen Bearbeitungsfall optimalen Daten sollten im Versuch oder während der Bearbeitung ermittelt werden.

The indicated values are only approximate values. The optimum for the respective machining should be determined experimentally or during processing.

Les valeurs de travail ne sont que des valeurs de référence. L'optimum des données doit être déterminé expérimentalement ou lors de l'usinage



## HPC-Spiralbohrer / HPC-twist drills / HPC-forets hélicoïdals

| Werkstoffe<br>Materials<br>Matériaux                                                                                                   | Vc<br>in m/min. | Vorschub f (mm/Umdrehung)<br>Infeed f (mm/revolution)<br>Avance f (mm/révolution) |                 |                 |           |
|----------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------------------------------------------------------------------------------|-----------------|-----------------|-----------|
|                                                                                                                                        |                 | Ø0,5-Ø1,0<br>mm                                                                   | Ø1,1-Ø1,5<br>mm | Ø1,6-Ø2,0<br>mm | Ø2,1-Ø3,0 |
| Stähle ≤ 600 N/mm <sup>2</sup><br>Steels ≤ 600 N/mm <sup>2</sup><br>Aciers ≤ 600 N/mm <sup>2</sup>                                     | 50-100          | 0,03-0,05                                                                         | 0,04-0,08       | 0,07-0,10       | 0,09-0,14 |
| Stähle ≤ 700 N/mm <sup>2</sup><br>Steels ≤ 700 N/mm <sup>2</sup><br>Aciers ≤ 700 N/mm <sup>2</sup>                                     | 50-90           | 0,03-0,05                                                                         | 0,04-0,08       | 0,07-0,10       | 0,09-0,14 |
| Stähle > 700 N/mm <sup>2</sup><br>Steels > 700 N/mm <sup>2</sup><br>Aciers > 700 N/mm <sup>2</sup>                                     | 50-90           | 0,02-0,05                                                                         | 0,04-0,07       | 0,06-0,10       | 0,08-0,13 |
| Stähle ≤ 900 N/mm <sup>2</sup><br>Steels ≤ 900 N/mm <sup>2</sup><br>Aciers ≤ 900 N/mm <sup>2</sup>                                     | 30-60           | 0,02-0,05                                                                         | 0,04-0,07       | 0,06-0,10       | 0,08-0,13 |
| Stähle ≤ 1000 N/mm <sup>2</sup><br>Steels ≤ 1000 N/mm <sup>2</sup><br>Aciers ≤ 1000 N/mm <sup>2</sup>                                  | 30-60           | 0,02-0,04                                                                         | 0,03-0,06       | 0,05-0,08       | 0,07-0,11 |
| Stähle > 1000 N/mm <sup>2</sup><br>Steels > 1000 N/mm <sup>2</sup><br>Aciers > 1000 N/mm <sup>2</sup>                                  | 30-60           | 0,01-0,03                                                                         | 0,02-0,05       | 0,04-0,06       | 0,05-0,08 |
| Rostfreie Stähle<br>Stainless steel<br>Aciers inoxydables                                                                              | 25-35           | 0,01-0,02                                                                         | 0,02-0,03       | 0,03-0,05       | 0,04-0,07 |
| Rost- und säurebeständige Stähle (Cr-Ni)<br>Rust and acid-resistant steels (Cr-Ni)<br>Aciers inoxydables résistants aux acides (cr-Ni) | 15-30           | 0,008-0,01                                                                        | 0,01-0,02       | 0,02-0,04       | 0,04-0,06 |
| Aluminiumlegierungen < 10% Si<br>Aluminium alloy < 10% Si<br>Alliages d'aluminium < 10% Si                                             | 100-150         | 0,02-0,06                                                                         | 0,05-0,08       | 0,07-0,11       | 0,09-0,15 |
| Aluminiumlegierungen > 10% Si<br>Aluminium alloy > 10% Si<br>Alliages d'aluminium > 10% Si                                             | 100-150         | 0,03-0,08                                                                         | 0,06-0,10       | 0,09-0,14       | 0,11-0,19 |
| Kupfer, Messing, Bronze<br>Copper, Brass, Bronze<br>Cuivre, Laiton, Bronze                                                             | 100-150         | 0,03-0,08                                                                         | 0,06-0,10       | 0,09-0,14       | 0,11-0,19 |
| CFK                                                                                                                                    | 80-100          | 0,01-0,03                                                                         | 0,02-0,05       | 0,04-0,06       | 0,05-0,09 |

\* \_ Die angegebenen Arbeitswerte sind Richtwerte.  
Die für den jeweiligen Bearbeitungsfall optimalen Daten sollten im Versuch oder während der Bearbeitung ermittelt werden.

The indicated values are only approximate values. The optimum for the respective machining should be determined experimentally or during processing.

Les valeurs de travail ne sont que des valeurs de référence. L'optimum des données doit être déterminé expérimentalement ou lors de l'usinage



#### Reibahlen / reamers / alésoirs

| Werkstoffe<br>Materials<br>Matériaux                                                                              | Vc<br>in m/min. | Vorschub pro Umdrehung<br>Infeed per rotation<br>Avance par rotation |      |      |      |
|-------------------------------------------------------------------------------------------------------------------|-----------------|----------------------------------------------------------------------|------|------|------|
|                                                                                                                   |                 | 2mm                                                                  | 6mm  | 10mm | 14mm |
| Stähle <700 N/mm <sup>2</sup><br>Steels <700 N/mm <sup>2</sup><br>Aciers <700 N/mm <sup>2</sup>                   | 20-25           | 0,1                                                                  | 0,12 | 0,18 | 0,18 |
| Stähle <1100 N/mm <sup>2</sup><br>Steels <1100 N/mm <sup>2</sup><br>Aciers <1100 N/mm <sup>2</sup>                | 12-18           | 0,08                                                                 | 0,1  | 0,18 | 0,18 |
| Stähle <1400 N/mm <sup>2</sup><br>Steels <1400 N/mm <sup>2</sup><br>Aciers <1400 N/mm <sup>2</sup>                | 10-15           | 0,08                                                                 | 0,09 | 0,15 | 0,2  |
| Rostfreie Stähle<br>Stainless steel<br>Aciers inoxydables                                                         | 7-12            | 0,07                                                                 | 0,1  | 0,12 | 0,15 |
| Titan<br>Titanium<br>Titane                                                                                       | 6-10            | 0,07                                                                 | 0,1  | 0,12 | 0,15 |
| Aluminium < 160 HB<br>Aluminium < 160 HB<br>Aluminium < 160 HB                                                    | 40-60           | 0,15                                                                 | 0,18 | 0,25 | 0,3  |
| Guss mit Lamellengraphit < 180 HB<br>Cast with lamellar graphite < 180 HB<br>Fonte à graphite lamellaire < 180 HB | 30-40           | 0,1                                                                  | 0,12 | 0,2  | 0,2  |
| Guss mit Kugelgraphit < 180 HB<br>Cast with spheroid. graphite < 180 HB<br>Fonte à graphite sphéroïdale < 180 HB  | 30-40           | 0,1                                                                  | 0,12 | 0,2  | 0,2  |
| Hartguss < 180 HB<br>Chilled iron < 180 HB<br>Fonte en coquilles < 180 HB                                         | 8-10            | 0,07                                                                 | 0,1  | 0,15 | 0,18 |
| Sonderlegierungen < 260 HB<br>Special alloys < 260 HB<br>Alliages spéciaux < 260 HB                               | 6-10            | 0,07                                                                 | 0,1  | 0,12 | 0,15 |
| Bronze<br>Bronze<br>Bronze                                                                                        | 20-25           | 0,15                                                                 | 0,18 | 0,22 | 0,35 |
| Kupfer<br>Copper<br>Cuivre                                                                                        | 25-30           | 0,12                                                                 | 0,18 | 0,2  | 0,25 |
| Messing<br>Brass<br>Laiton                                                                                        | 35-40           | 0,2                                                                  | 0,22 | 0,3  | 0,35 |
| Kupfer<br>Copper<br>Cuivre                                                                                        | 25-30           | 0,12                                                                 | 0,18 | 0,2  | 0,25 |
| Messing<br>Brass<br>Laiton                                                                                        | 35-40           | 0,2                                                                  | 0,22 | 0,3  | 0,35 |

\* - Die angegebenen Arbeitswerte sind Richtwerte.  
Die für den jeweiligen Bearbeitungsfall optimalen Daten sollten im Versuch oder während der Bearbeitung ermittelt werden.

The indicated values are only approximate values. The optimum for the respective machining should be determined experimentally or during processing.

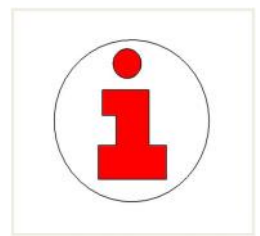
Les valeurs de travail ne sont que des valeurs de référence. L'optimum des données doit être déterminé expérimentalement ou lors de l'usinage



## Schafffräser / end mills / fraises

| Werkstoffe<br>Materials<br>Matériaux                                                                                  | Vc<br>in m/min. | Vorschub (mm/Zahn) Infeed (mm/tooth) Avance (mm/dent) |       |       |       |       |        |
|-----------------------------------------------------------------------------------------------------------------------|-----------------|-------------------------------------------------------|-------|-------|-------|-------|--------|
|                                                                                                                       |                 | Ø1-2                                                  | Ø3-4  | Ø5-6  | Ø7-8  | Ø9-10 | Ø11-12 |
| Aluminium, Al-Legierungen<br>Aluminium, Al-alloys<br>Aluminium, Alliages d'aluminium                                  | 183-365         | 0,005                                                 | 0,028 | 0,050 | 0,101 | 0,152 | 0,203  |
| Messing, Bronze<br>Brass, bronze<br>Laiton, Bronze                                                                    | 60-107          | 0,013                                                 | 0,025 | 0,050 | 0,067 | 0,100 | 0,125  |
| Kupfer, Kupferlegierungen<br>Copper, copper alloys<br>Cuivre, alliages de cuivre                                      | 107-275         | 0,013                                                 | 0,032 | 0,050 | 0,073 | 0,119 | 0,153  |
| Gusseisen, weich<br>Cast iron, soft<br>Fonte de fer, doux                                                             | 60-153          | 0,013                                                 | 0,032 | 0,050 | 0,084 | 0,152 | 0,203  |
| Gusseisen, hart<br>Cast iron, hard<br>Fonte de fer, dur                                                               | 24-107          | 0,008                                                 | 0,010 | 0,020 | 0,038 | 0,075 | 0,102  |
| Sphäroguss<br>Ductile cast iron<br>Fonte sphérolitique                                                                | 24-122          | 0,005                                                 | 0,013 | 0,025 | 0,053 | 0,110 | 0,153  |
| Temperguss<br>Malleable iron<br>Fonte malléable                                                                       | 122-183         | 0,005                                                 | 0,015 | 0,025 | 0,059 | 0,127 | 0,178  |
| Magnesium, Magnesium-Legierung<br>Magnesium, magnesium alloys<br>Magnésium, alliage de magnésium                      | 245-427         | 0,013                                                 | 0,032 | 0,050 | 0,084 | 0,100 | 0,254  |
| Monel (Legierung m. hohem Ni-Anteil)<br>Monel (alloy with high Ni content)<br>Monel (alliage av. forte teneur nickel) | 45-90           | 0,005                                                 | 0,013 | 0,020 | 0,038 | 0,075 | 0,102  |
| Kunststoffe<br>Plastics<br>Plastiques                                                                                 | 183-365         | 0,015                                                 | 0,046 | 0,076 | 0,144 | 0,279 | 0,380  |
| Faserverstärkte Kunststoffe<br>Fiber-reinforced plastics<br>Plastiques renforcés de fibres                            | 90-245          | 0,015                                                 | 0,046 | 0,076 | 0,127 | 0,229 | 0,305  |
| Hitzebeständige Legierungen<br>Heat resistant alloys<br>Alliages réfractaires                                         | 24-122          | 0,005                                                 | 0,032 | 0,025 | 0,035 | 0,042 | 0,050  |
| Stahl, geringer Kohlenstoffgehalt<br>Steel, low carbon content<br>Acier, faible teneur en carbone                     | 60-153          | 0,005                                                 | 0,015 | 0,025 | 0,059 | 0,127 | 0,178  |
| Stahl, mittlerer Kohlenstoffgehalt<br>Steel, medium carbon content<br>Acier, teneur en carbone moyenne                | 30-75           | 0,010                                                 | 0,024 | 0,038 | 0,057 | 0,096 | 0,125  |
| Gehärteter Stahl<br>Hardened steel<br>Acier trempé                                                                    | 7-37            | 0,005                                                 | 0,009 | 0,013 | 0,027 | 0,055 | 0,076  |
| Stahlguss<br>Cast steel<br>Fonte d'acier                                                                              | 60-107          | 0,005                                                 | 0,015 | 0,025 | 0,053 | 0,110 | 0,153  |
| Werkzeugstahl<br>Tool steel<br>Acier à outils                                                                         | 30-90           | 0,005                                                 | 0,015 | 0,025 | 0,053 | 0,110 | 0,153  |

\* - siehe Vermerk / see note / voir la note



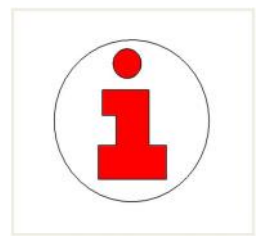
## Mikrofräser / micro mills / mini fraises

| Werkstoffe<br>Materials<br>Matériaux                                                                                                                                                        | Vc<br>in m/min. | Vorschub (mm/Zahn) Infeed per rotation Avance per rotation |       |       |       |       |       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------------------------------------------------------|-------|-------|-------|-------|-------|
|                                                                                                                                                                                             |                 | Ø1                                                         | Ø2    | Ø3    | Ø4    | Ø5    | Ø6    |
| Stähle 800-1000 N/mm <sup>2</sup><br>Steels 800-1000 N/mm <sup>2</sup><br>Aciers 800-1000 N/mm <sup>2</sup>                                                                                 | 75-140          | 0,010                                                      | 0,014 | 0,018 | 0,022 | 0,026 | 0,030 |
| Stähle 1000-1450 N/mm <sup>2</sup><br>Steels 1000-1450 N/mm <sup>2</sup><br>Aciers 1000-1450 N/mm <sup>2</sup>                                                                              | 55-120          | 0,007                                                      | 0,011 | 0,015 | 0,019 | 0,023 | 0,027 |
| Grauguss < 180 HB<br>Cast iron < 180 HB<br>Fonte grise < 180 HB                                                                                                                             | 65-140          | 0,010                                                      | 0,016 | 0,022 | 0,028 | 0,034 | 0,040 |
| Grauguss > 180 HB<br>Cast iron > 180 HB<br>Fonte grise > 180 HB                                                                                                                             | 65-125          | 0,010                                                      | 0,016 | 0,022 | 0,028 | 0,034 | 0,040 |
| Aluminiumlegierungen<br>Aluminium alloy<br>Alliages d'aluminium                                                                                                                             | 150-330         | 0,012                                                      | 0,021 | 0,029 | 0,038 | 0,046 | 0,055 |
| Kupfer<br>Cooper<br>Cuivre                                                                                                                                                                  | 65-185          | 0,010                                                      | 0,016 | 0,022 | 0,028 | 0,034 | 0,040 |
| Titanlegierungen<br>Titanium alloy<br>Alliages de titane                                                                                                                                    | 25-65           | 0,008                                                      | 0,011 | 0,015 | 0,018 | 0,022 | 0,025 |
| Rostfreie Stähle<br>Stainless steel<br>Aciers inoxydables                                                                                                                                   | 20-90           | 0,010                                                      | 0,016 | 0,022 | 0,028 | 0,034 | 0,040 |
| Hochwarmfeste Stähle<br>Cr/Ni-Legierungen (Nimonic, Inconel)<br>highly heat resisting steels<br>Cr/Ni-alloys (Nimonic, Inconel)<br>Aciers réfractaires<br>Alliages Cr/Ni (Nimonic, Inconel) | 10-25           | 0,007                                                      | 0,009 | 0,011 | 0,014 | 0,016 | 0,018 |

\* \_ Die angegebenen Arbeitswerte sind Richtwerte.  
Die für den jeweiligen Bearbeitungsfall optimalen Daten sollten im Versuch oder während der Bearbeitung ermittelt werden.

The indicated values are only approximate values. The optimum for the respective machining should be determined experimentally or during processing.

Les valeurs de travail ne sont que des valeurs de référence. L'optimum des données doit être déterminé expérimentalement ou lors de l'usinage



## Fräsen(CFK/GFK) / milling(CFRP) / fraisage(PRFC/PRFV)

Die angegebenen Arbeitswerte sind Richtwerte.  
 Die für den jeweiligen Bearbeitungsfall optimalen Daten sollten im Versuch oder Während der Bearbeitung ermittelt werden.

| Werkstoffe<br>Materials<br>Matériaux | Vc<br>in m/min. | Vorschub (mm/Zahn)<br>Infeed per rotation<br>Avance per rotation |       |      |       |
|--------------------------------------|-----------------|------------------------------------------------------------------|-------|------|-------|
|                                      |                 | Ø2                                                               | Ø5    | Ø10  | Ø20   |
| Polyamid                             | 250-500         | 0,1                                                              | 0,2   | 0,35 | 0,45  |
| Polyolefine                          | 250-500         | 0,1                                                              | 0,2   | 0,35 | 0,45  |
| Polyacetale                          | 300             | 0,15                                                             | 0,3   | 0,4  | 0,5   |
| Polyester                            | 300             | 0,15                                                             | 0,3   | 0,4  | 0,5   |
| Polycarbonat                         | 300             | 0,15                                                             | 0,3   | 0,4  | 0,5   |
| Polyphenylenether                    | 300             | 0,15                                                             | 0,3   | 0,4  | 0,5   |
| Aromat Polyamid                      | 300             | 0,15                                                             | 0,3   | 0,4  | 0,5   |
| ABS                                  | 300-500         | 0,1                                                              | 0,2   | 0,35 | 0,45  |
| Fluorpolymere                        | 250-500         | 0,1                                                              | 0,2   | 0,35 | 0,45  |
| Polysulfon                           | 250-500         | 0,1                                                              | 0,2   | 0,35 | 0,45  |
| Polyphenylsulfon                     | 250-500         | 0,1                                                              | 0,2   | 0,35 | 0,45  |
| Polyethersulfon                      | 250-500         | 0,1                                                              | 0,2   | 0,35 | 0,45  |
| Polyetherimid                        | 250-500         | 0,1                                                              | 0,2   | 0,35 | 0,45  |
| Polyphenylensulfid                   | 250-500         | 0,1                                                              | 0,2   | 0,35 | 0,45  |
| Polyetherkethon                      | 250-500         | 0,1                                                              | 0,2   | 0,35 | 0,45  |
| Polyimid                             | 60-100          | 0,05                                                             | 0,1   | 0,2  | 0,35  |
| CFK                                  | 150             | 0,02                                                             | 0,04  | 0,06 | 0,08  |
| GFK                                  | 100             | 0,02                                                             | 0,04  | 0,06 | 0,08  |
| Atamidfaser                          | 90-120          | 0,02                                                             | 0,04  | 0,06 | 0,08  |
| Graphit                              | 80-100          | 0,02                                                             | 0,025 | 0,05 | 0,075 |
|                                      |                 |                                                                  |       |      |       |
|                                      |                 |                                                                  |       |      |       |
|                                      |                 |                                                                  |       |      |       |

\* \_ Die angegebenen Arbeitswerte sind Richtwerte.  
 Die für den jeweiligen Bearbeitungsfall optimalen Daten sollten im Versuch oder während der Bearbeitung ermittelt werden.

The indicated values are only approximate values. The optimum for the respective machining should be determined experimentally or during processing.

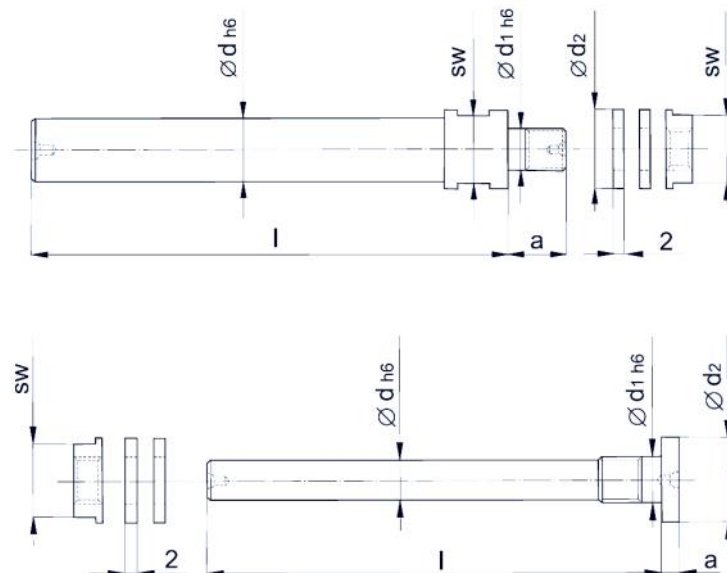
Les valeurs de travail ne sont que des valeurs de référence. L'optimum des données doit être déterminé expérimentalement ou lors de l'usinage



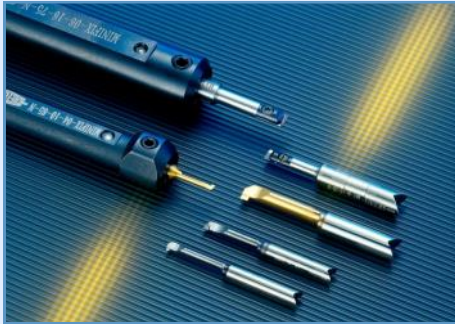
| Sorte<br>Grade<br>Nuance | Mittlere WC<br>Korngröße $\mu\text{m}$<br>Average VC grainsize $\mu\text{m}$<br>Taille moyenne des grains<br>WC $\mu\text{m}$ | WC in %<br>WC in %<br>WC in % | Co in %<br>Co in %<br>Co in % | Dichte $\text{g/cm}^3$<br>Density $\text{g/cm}^3$<br>Densité $\text{g/cm}^3$ | Härte HV30<br>Hardness HV30<br>Dureté HV30 |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------|------------------------------------------------------------------------------|--------------------------------------------|
| UFK-10                   | 0,8                                                                                                                           | 94                            | 6                             | 14,8                                                                         | 1780                                       |
| UFK-21                   | 0,8                                                                                                                           | 90                            | 10                            | 14,5                                                                         | 1560                                       |
| UFK-22                   | 0,4                                                                                                                           | 91                            | 8,2                           | 14,55                                                                        | 1930                                       |
| UFK-44                   | 0,4                                                                                                                           | 87,6                          | 12                            | 14,1                                                                         | 1730                                       |

| Sorte<br>Grade | Biegebruchfestigkeit $\text{N/mm}^2$<br>Bending strength $\text{N/mm}^2$ | Druckfestigkeit $\text{N/mm}^2$<br>Compression strength $\text{N/mm}^2$ |
|----------------|--------------------------------------------------------------------------|-------------------------------------------------------------------------|
| UFK-10         | 3000                                                                     | 6000                                                                    |
| UFK-21         | 3700                                                                     | 5500                                                                    |
| UFK-22         | 4400                                                                     | 7400                                                                    |
| UFK-44         | 4600                                                                     | 6600                                                                    |

## Fräsdorne / Milling arbors / Rasseaux porte-fraise



- ⇒ auf Anfrage erhältlich
- ⇒ Available on request
- ⇒ Disponible sur demande



## Minifix

### Innenbearbeitungssysteme

Viele Sonderlösungen bietet das System „Minifix“ für die Innenbearbeitung

This system offers many off-standard solutions for internal machining



## Stufenbohrwerkzeuge

Hervorragende Oberflächen durch Feinstschleiftechnik  
Bohren und Gewindeschneiden in einem Arbeitsgang  
als Sonderwerkzeug

Excellent surface quality due to a fine grinding technology  
Drilling and threading in one operation with a special tool



## Spezial Fräswerkzeuge

Wir bieten Sonderbeschichtungen für  
Trockenbearbeitung

We offer special coatings for dry processing



## Wendeplattenwerkzeuge

### Insert tools

In erster Linie werden allseitig  
geschliffene Wendeplatten eingesetzt.

Especially, we manufacture inserts which are precision ground on all sides

## Innovatives Werkzeugsystem zur Zerspänung von Kunststoffen

Universal system for plastic machining



# Otto Dieterle Spezialwerkzeuge GmbH

Predigerstr. 56  
78628 Rottweil, Germany

Tel.: +49 (0) 741 / 9 42 05 - 0  
Fax: +49 (0) 741 / 9 42 05 - 50  
Email: [info@dieterle-tools.com](mailto:info@dieterle-tools.com)

[www.dieterle-tools.com](http://www.dieterle-tools.com)

