Kaestner
TOOLS




# Standardkatalog KT21/1
Standard Catalog KT21/1

we know how.

Kaestner
TOOLS

**Innenbearbeitung** | Internal application

## **Bohren** | Drilling

ab Seite **20** | as of Page **20**

## **Fräsen** | Milling

ab Seite **31** | as of Page **31**

**Außenbearbeitung** | External application

## **Fräsen** | Milling

ab Seite **40** | as of Page **40**

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# **Über uns**
# About us

**Als Spezialist für rundlaufende Werkzeuge entwickelt und fertigt Kaestner-Tools Hochleistungs-Werkzeuge, die durch ihre Präzision, Leistungsfähigkeit und Prozesssicherheit überzeugen.** | As a specialist for rotating tools, Kaestner-Tools is dedicated to providing high performance tools with high precision, reliability and competitiveness.



Den Grundstein legten Bianka und Jürgen Kästner im Jahr 1990 mit der Gründung des erfolgreichen Familienunternehmens Kästner Präzisionswerkzeuge am Standort Steinbach-Hallenberg. Im Zuge der Aufnahme in die weltweit agierende SIMTEK Gruppe im Jahr 2018 ging daraus die Kaestner-Tools GmbH hervor. Die Sortimente der beiden Werkzeugspezialisten SIMTEK und Kaestner ergänzen sich dabei gegenseitig auf ideale Weise.

Mit nahezu 30 Jahren Erfahrung fokussieren sich die Mitarbeiter bei Kaestner auf die individuellen Anforderungen ihrer Kunden und bieten dabei effiziente und verlässliche Lösungen weit außerhalb des Standards.

Kaestner-Tools: **We know how!**

In 1990, Bianka and Jürgen Kästner founded this successful family business in Steinbach-Hallenberg as Kästner Präzisionswerkzeuge. In 2018, Kästner became part of the globally acting SIMTEK-Group, which is focused on providing highly specialized cutting tools, under the new name Kaestner-Tools GmbH. The range of tools of both specialists SIMTEK and Kaestner are a perfect match to each other.

With nearly 30 years of experience the team at Kaestner focuses on the specific needs of its customers and provides efficient and reliable solutions far beyond the limitations of standard items.

Kaestner-Tools: **We know how!**

# **Kundenindividuelle Werkzeuglösungen**
Customer-specific tooling solutions

Die Optimierung Ihres Fertigungsprozesses, die Verbesserung Ihrer Bauteilqualität oder die Steigerung der allgemeinen Kosteneffizienz – mit den optimal auf Ihre individuelle Bearbeitung abgestimmten Individualwerkzeugen von Kaestner-Tools lassen sich viele Vorteile erreichen!

Kaestner-Tools ist seit jeher darauf spezialisiert, seinen Kunden durch hochqualitative Präzisionswerkzeuge Vorteile zu bieten, welche weit über die tatsächliche Bearbeitung hinaus gehen!

**Kontaktieren Sie uns und profitieren Sie von optimal an Ihre Bedürfnisse angepassten Werkzeuglösungen!**

Optimizing your manufacturing process, improving your component quality or increasing your overall cost efficiency – many benefits can be achieved with customized tools by Kaestner-Tools that are optimally designed for your individual machining process!

Kaestner-Tools has always specialized in offering its customers advantages through high-quality precision tools, which go far beyond the actual machining process!

**Contact us and benefit from tooling solutions optimally adapted to your needs!**



## **Kontakt** | Contact


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**Fax** +49 36847 356 11
**Mail** info@kaestner.com
**Web** www.kaestner.com


Bestellungen, Fragen zu Aufträgen und allgemeine Fragen | Orders, questions on orders and general questions: **sales@kaestner.com | +49 36847 356 0**

Anfragen und Fragen zu Angeboten | Inquiries and questions regarding offers: **offer@kaestner.com | +49 7473 9517 220**

Anwendungsfragen und allgemeiner technischer Support | Questions on the usage of the tools and general technical support: **support@kaestner.com | +49 7473 9517 150**

# **Informationen zur Katalognutzung.**
# Information on using the catalog.

ID: 1401

**Bohren! Mit Kaestner-Tools** | Drill! With Kaestner-Tools
**Mikropräzisionsbohrer** | Micro precision-drills

Kaestner TOOLS

## Mikropräzisionsbohrer, 12xD

Mit Schaftaufnahme nach DIN 6535 HA und Schaftkühlung von Aussen über sechs Kühlkanäle. Bohrertoleranz m7 für eine Bohrungsqualität unter Normalbedingungen von H9. Präzisions-Spitzenanschliff mit optimierter Schneidengeometrie.

## Micro precision-drills, 12xD

Shank according to DIN 6535 HA with external shank cooling via six coolant channels. Drill tolerance m7 for a bore quality of H9 at normal conditions. Precision point cut with optimized cutting edge geometry.

Empfehlungen | Recommendations: **ab Seite | as of Page 61**

**E01 · E02 · E03 · H01.1**

Legende | Legend: **ab Seite | as of Page 60**



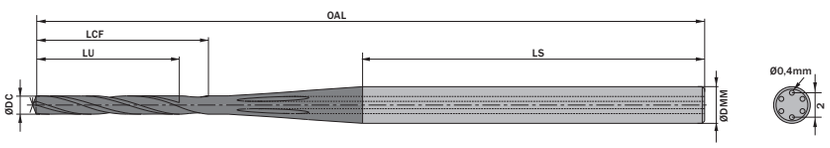




Abbildung ähnlich / Examplary image

Zur Verwendung dieser Mikropräzisionsbohrer wird eine vorgelagerte Pilotbohrung empfohlen. Geeignete Pilotbohrer finden Sie **ab Seite 21** | We recommend a preceding pilot drill for the usage of these micro precision-drills. You can find suitable pilot drills **as of page 21**

| ØDC | Artikelnummer Part number | Webcode | LU | LCF | ØDMM | LS | OAL | Vorschub f Feed f |
|---|---|---|---|---|---|---|---|---|
| mm | | | mm | mm | mm | mm | mm | mm/U \| mm/r |
| 0,5 | **DS.AL15.0050.ZA** | A73Z | 6,0 | 7,0 | 3,0 | 28,0 | 45,0 | 0,02 – 0,04 |
| 0,6 | **DS.AL15.0060.ZA** | A731 | 7,2 | 8,0 | 3,0 | 28,0 | 45,0 | 0,02 – 0,04 |
| 0,7 | **DS.AL15.0070.ZA** | A733 | 8,4 | 9,0 | 3,0 | 28,0 | 45,0 | 0,02 – 0,04 |
| 0,8 | **DS.AL15.0080.ZA** | A735 | 9,6 | 11,0 | 3,0 | 28,0 | 45,0 | 0,02 – 0,04 |
| 0,9 | **DS.AL15.0090.ZA** | A737 | 10,8 | 12,0 | 3,0 | 28,0 | 45,0 | 0,02 – 0,04 |
| 1,0 | **DS.AL15.0100.ZA** | A739 | 12,0 | 13,0 | 3,0 | 28,0 | 55,0 | 0,02 – 0,04 |
| 1,1 | **DS.AL15.0110.ZA** | A74B | 13,2 | 15,0 | 3,0 | 28,0 | 55,0 | 0,03 – 0,07 |
| 1,2 | **DS.AL15.0120.ZA** | A74D | 14,4 | 16,0 | 3,0 | 28,0 | 55,0 | 0,03 – 0,07 |
| 1,3 | **DS.AL15.0130.ZA** | A74F | 15,6 | 17,0 | 3,0 | 28,0 | 55,0 | 0,03 – 0,07 |
| 1,4 | **DS.AL15.0140.ZA** | A74H | 16,8 | 18,0 | 3,0 | 28,0 | 55,0 | 0,03 – 0,07 |
| 1,5 | **DS.AL15.0150.ZA** | A74K | 18,0 | 20,0 | 3,0 | 28,0 | 55,0 | 0,03 – 0,07 |

**Unsere Schneidstoff- und Schnittwertempfehlungen (Vc m/min) | Our cutting grade and cutting speed recommendations (Vc m/min)**

Erklärung zu den Materialgruppen finden Sie auf Seite 67 | Explanations regarding the material groups can found on page 67

| Materialgruppen Material groups / Schneidstoff Cutting grade | P | | | | | | H | | K | | | M | | | S | | | | N | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PI | PII | PIII | PIV | PV | PVI | HI | HII | KI | KII | KIII | MI | MII | MIII | SI | SII | SIII | SIV | NI | NII | NIII | NIV | NV | NVI |
| **00 P343** | **105** | **115** | **80** | **75** | **55** | **55** | - | - | **125** | **110** | **105** | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **00 M347** | - | - | - | - | - | - | **60** | **20** | - | - | - | **30** | **40** | **30** | **20** | **20** | **20** | **25** | - | - | - | - | - | - |
| **00 N351** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **200** | **180** | **180** | **135** | **100** | - |
| **00 C372** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **120** | **80** |


| **00 C372** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **120** | **80** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|


Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade
Bestellbeispiel | Order example: **DS.AL15.0050.ZA 00 P343 oder A73Z 00 P343** (00 P343 = Schneidstoff | Grade)

## **Hinweise und Empfehlungen** | Notes and recommendations

Im rechten oberen Bereich finden Sie Querverweise zu nützlichen Hinweisen und Empfehlungen zur optimalen Anwendung sowie Icons mit wichtigen Eigenschaften der jeweiligen Werkzeuge.

In the upper right area you will find cross references to useful notes and recommendations for an optimal use, as well as icons with important properties of the tools.

## **Maßtabelle** | Dimensions table

Maßtabelle mit relevanten Maßen sowie Artikelnummer und Webcode.

Table with relevant dimensions, part number and Webcode.

| ØDC | Artikelnummer Part number | Webcode | LU | LCF | ØDMM | LS | OAL | Vorschub f Feed f |
|---|---|---|---|---|---|---|---|---|
| mm | | | mm | mm | mm | mm | mm | mm/U \| mm/r |
| 0,5 | **DS.AL15.0050.ZA** | A73Z | 6,0 | 7,0 | 3,0 | 28,0 | 45,0 | 0,02 – 0,04 |
| 0,6 | **DS.AL15.0060.ZA** | A731 | 7,2 | 8,0 | 3,0 | 28,0 | 45,0 | 0,02 – 0,04 |
| 0,7 | **DS.AL15.0070.ZA** | A733 | 8,4 | 9,0 | 3,0 | 28,0 | 45,0 | 0,02 – 0,04 |

## **Der Webcode** | The Webcode

Jedes Kaestner-Tools Werkzeug besitzt neben einer sprechenden Artikelnummer einen eigenen und eindeutigen Webcode, welcher alternativ zur Artikelnummer auch zur Bestellung eines Werkzeugs genutzt werden kann.

In addition to a specific part number, each Kaestner-Tools tool has its own unique Webcode. The Webcode can alternatively be used to order a tool.

## **Schneidstoff- und Schnittwertempfehlungen**
## Cutting grade and cutting speed recommendations

Diese Tabelle zeigt an, welcher Schneidstoff für den Einsatz in der jeweiligen ISO-Gruppe von uns empfohlen wird. Die entsprechenden und von uns empfohlenen Schnittwerte können Sie ebenfalls dieser Tabelle entnehmen.

This table shows which cutting grade we recommend for use in the respective ISO group. The corresponding cutting speed recommendations can also be found in this table.

## **Bestellhinweise und weitere Informationen** | Ordering notes and additional information

Neben einem Bestellbeispiel finden Sie im unteren Bereich einer Katalogseite noch weitere Informationen, sofern diese für die jeweilige Katalogseite relevant sind.

Beside an order example, you can find additional information - if these are relevant for the respective catalog page - in the lower area of the catalog page.

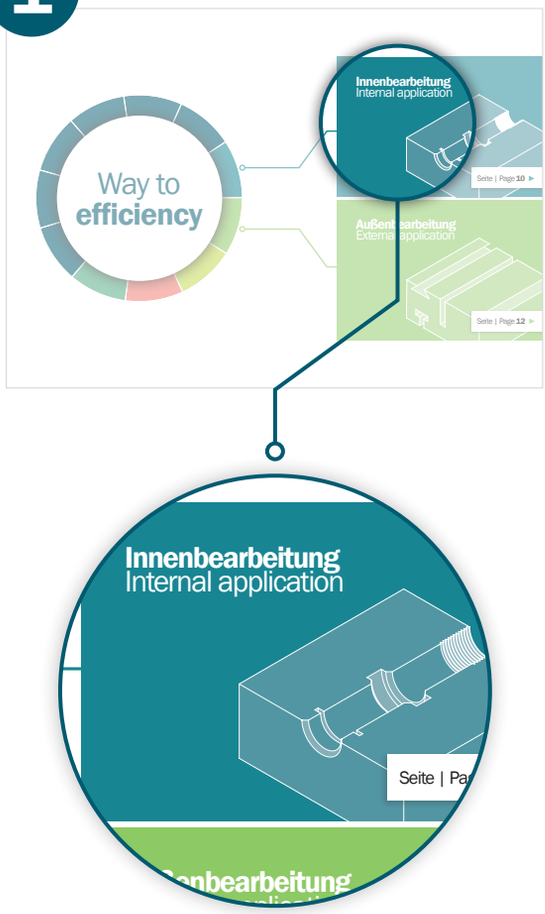
| ❶ | ❷ | | ❸ | ❷ |
|---|---|---|---|---|
| DS.AL15.0050.ZA | 00 P343 | = | A73Z | 00 P343 |
| MS.DI3S.060.13.EB | P1 U333 | = | A6N9 | P1 U333 |

❶ Artikel | Item
❷ Schneidstoff | Grade
❸ Webcode

# Way to efficiency.

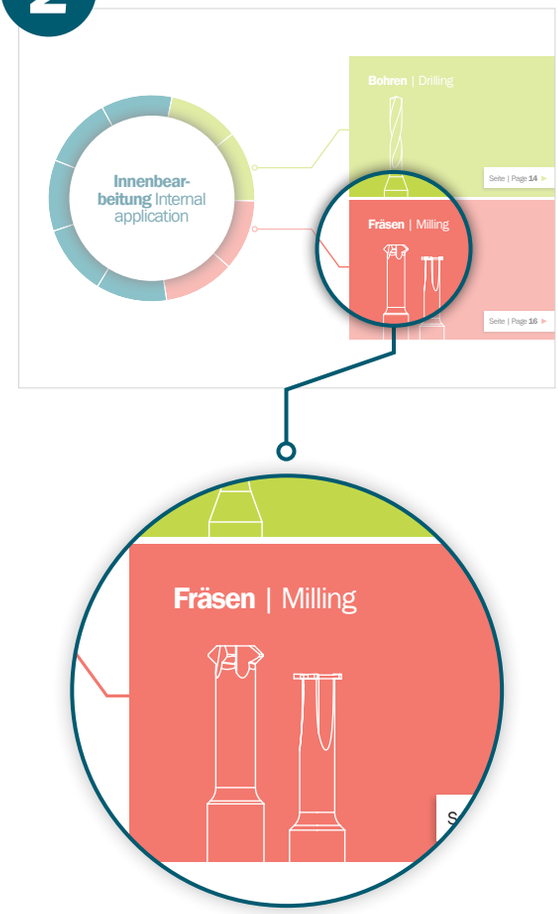
Der einfache Weg zum passenden Werkzeug!
The easy way to find the right tool!

1




**Suchen Sie ein Werkzeug für die Innen- oder Außenbearbeitung?** | Are you looking for a tool for internal or external machining?

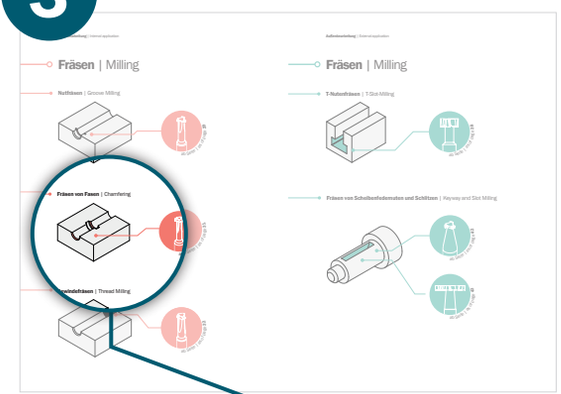
2

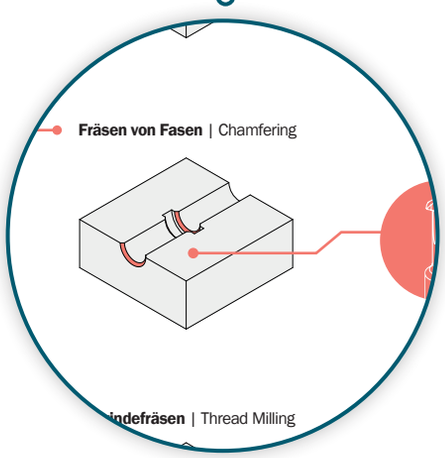



**Für welches Bearbeitungsverfahren suchen Sie ein Werkzeug?** | For which machining process are you looking for a tool?

**Der „Way to efficiency“ führt Sie schnell und einfach zu den passenden Werkzeugen für Ihre kosteneffiziente Bauteilfertigung!** | The „Way to Efficiency“ quickly and easily leads you to the suitable tools for your cost-efficient component manufacturing!

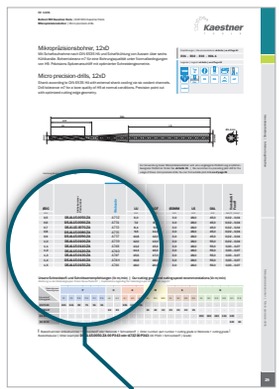
3

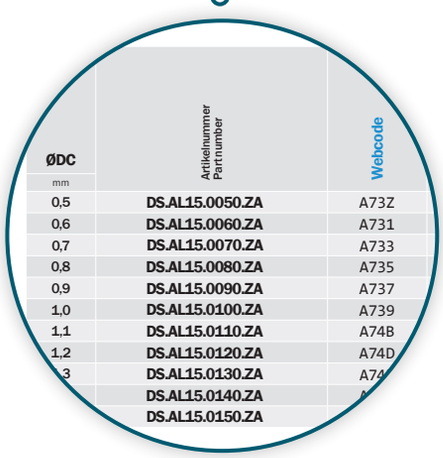



**Welche Bearbeitung soll Ihr Werkzeug durchführen?** | Which machining operation shall your tool perform?

4





| ØDC mm | Artikelnummer Part number | Webcode |
|---|---|---|
| 0,5 | DS.AL15.0050.ZA | A73Z |
| 0,6 | DS.AL15.0060.ZA | A731 |
| 0,7 | DS.AL15.0070.ZA | A733 |
| 0,8 | DS.AL15.0080.ZA | A735 |
| 0,9 | DS.AL15.0090.ZA | A737 |
| 1,0 | DS.AL15.0100.ZA | A739 |
| 1,1 | DS.AL15.0110.ZA | A74B |
| 1,2 | DS.AL15.0120.ZA | A74D |
| ,3 | DS.AL15.0130.ZA | A74 |
| | DS.AL15.0140.ZA | |
| | DS.AL15.0150.ZA | |

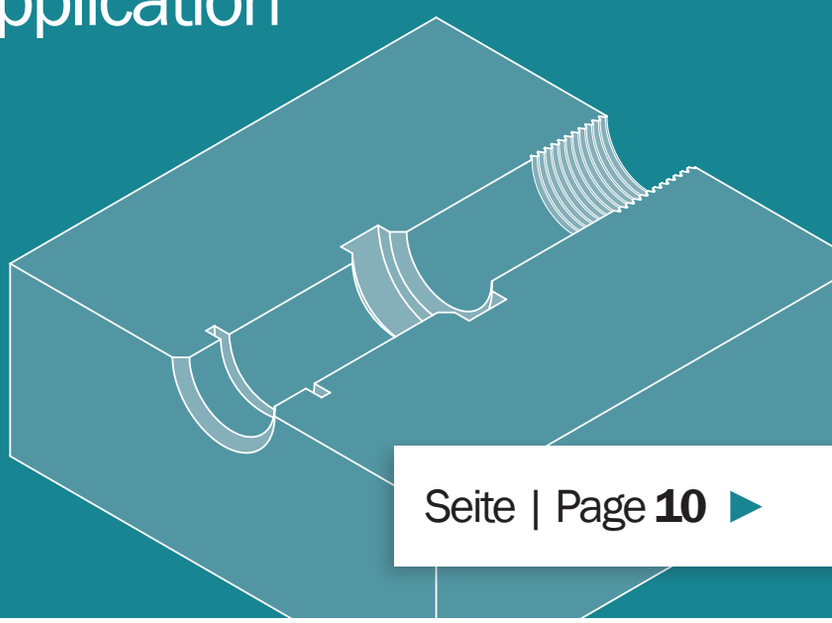
**Wählen Sie nun anhand der angegebenen Werkzeugmaße Ihr passendes Werkzeug.** Select your suitable tool according to the given tool dimensions.

5

**Bestellen Sie Ihre Werkzeuge per E-Mail an sales@kaestner.com oder telefonisch unter +49 36847 356-0.** | Order your tools by e-mail to sales@kaestner.com or by phone at +49 36847 356-0.

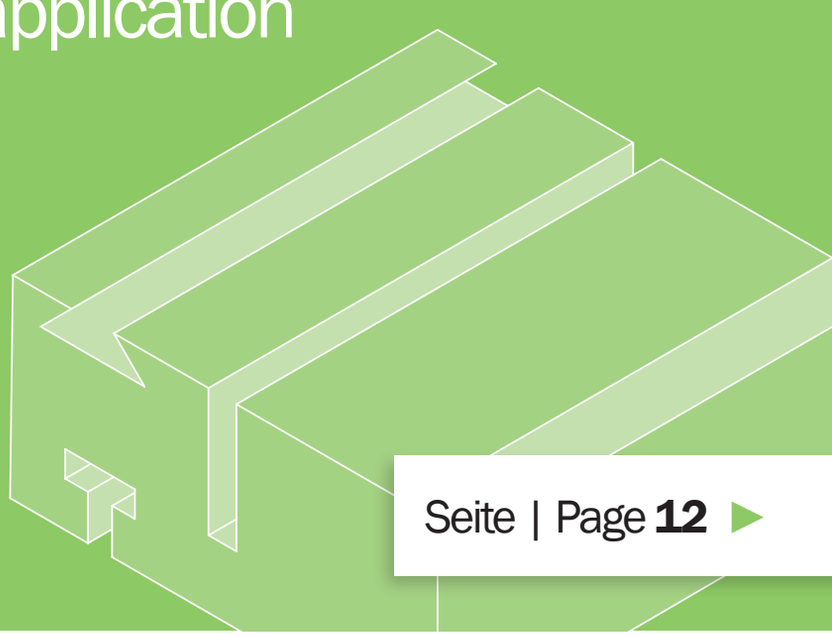

Way to
efficiency

## **Innenbearbeitung**
Internal application



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## **Außenbearbeitung**
External application



Seite | Page **12** ▶

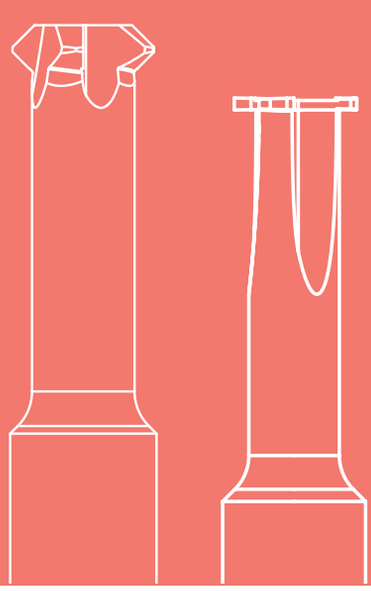

**Innenbear-**
**beitung** Internal
application

## **Bohren** | Drilling



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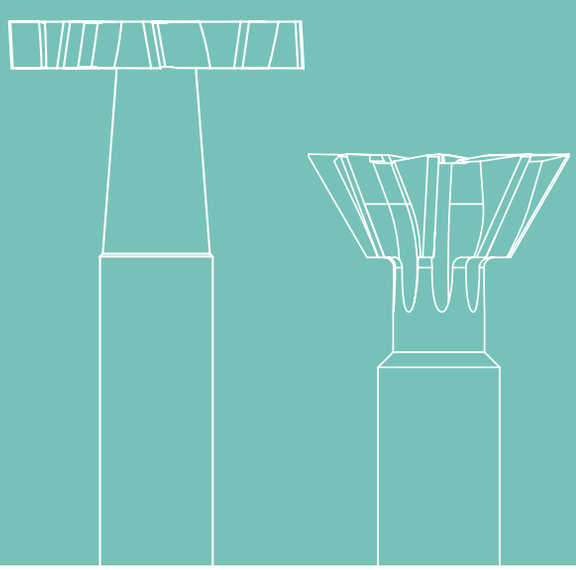
## **Fräsen** | Milling



Seite | Page **16** ▶


**Außenbear-**
**beitung** External
application

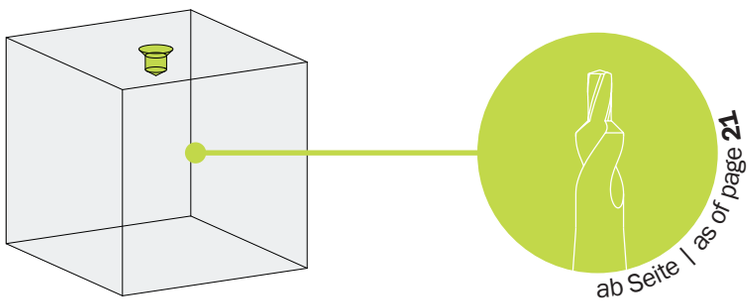
# **Fräsen** | Milling



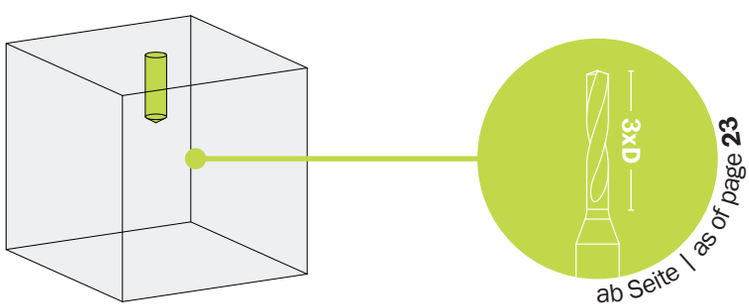
Seite | Page **17** ▶

# **Bohren** | Drilling

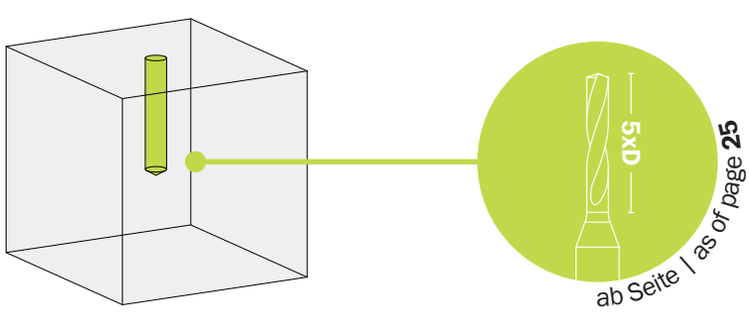
## **Pilotbohrer** | Pilot drill




## **Mikropräzisionsbohrer 3xD** | Micro precision-drill 3xD

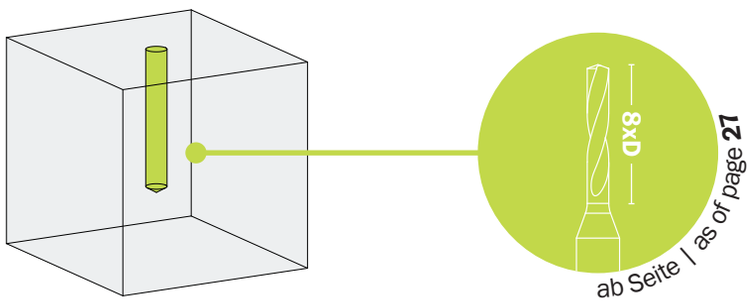



## **Mikropräzisionsbohrer 5xD** | Micro precision-drill 5xD

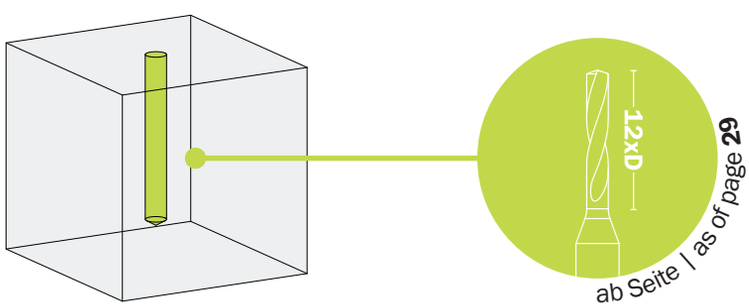


# **Bohren** | Drilling

## **Mikropräzisionsbohrer 8xD** | Micro precision-drill 8xD

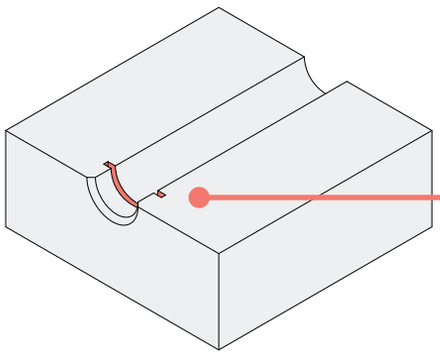



## **Mikropräzisionsbohrer 12xD** | Micro precision-drill 12xD



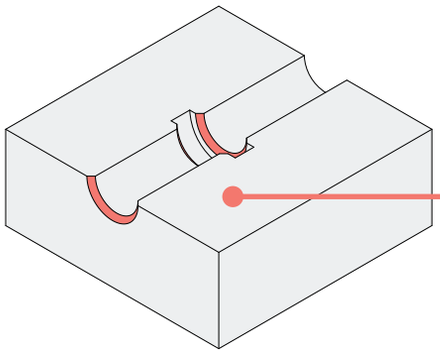
# **Fräsen** | Milling

## **Nutfräsen** | Groove Milling



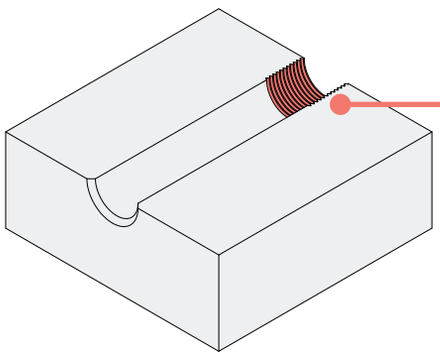
ab Seite | as of page **32**

## **Fräsen von Fasen** | Chamfering



ab Seite | as of page **34**

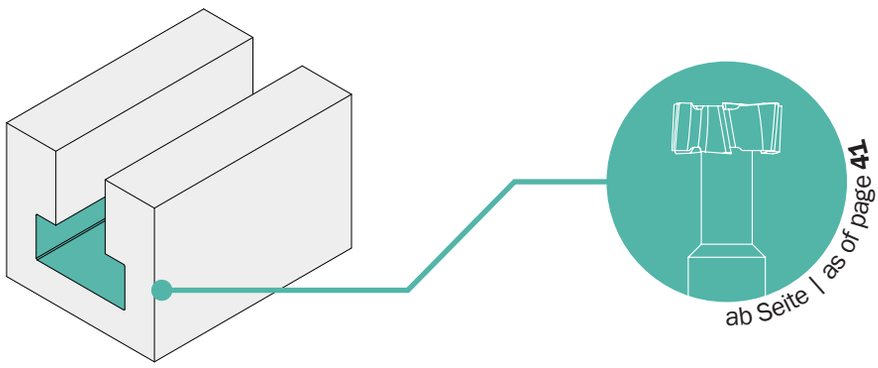
## **Gewindefräsen** | Thread Milling



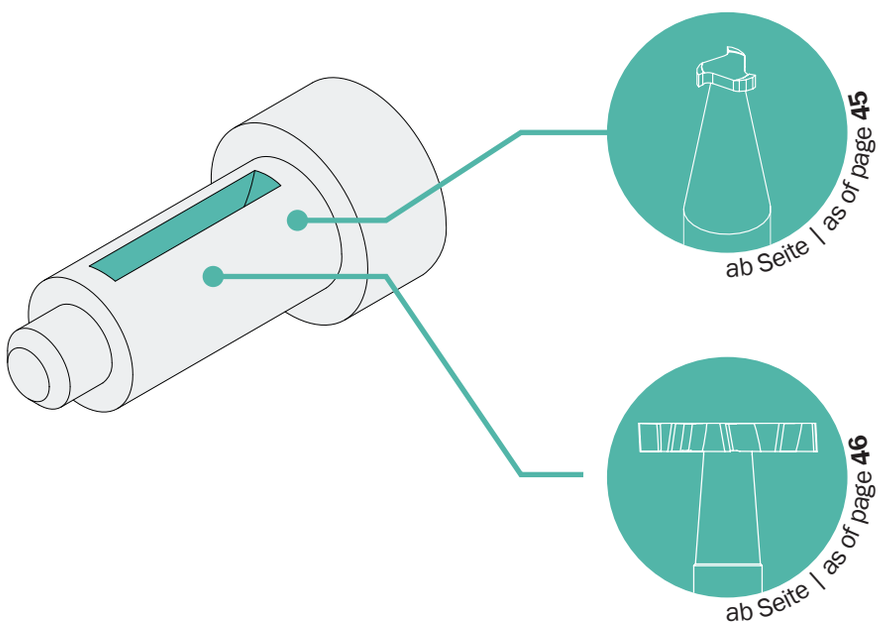
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# **Fräsen** | Milling

## **T-Nutenfräsen** | T-Slot-Milling

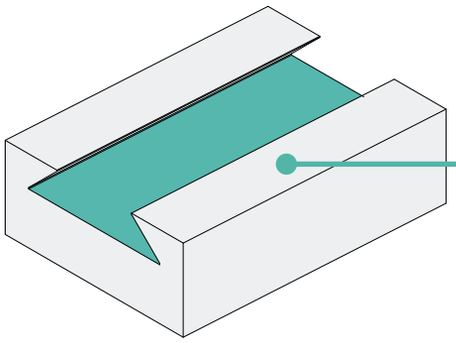


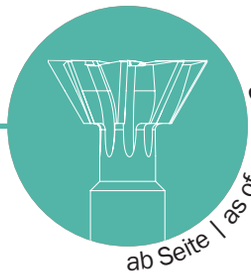

## **Fräsen von Scheibenfedernuten und Schlitzen** | Keyway and Slot Milling



# **Fräsen** | Milling

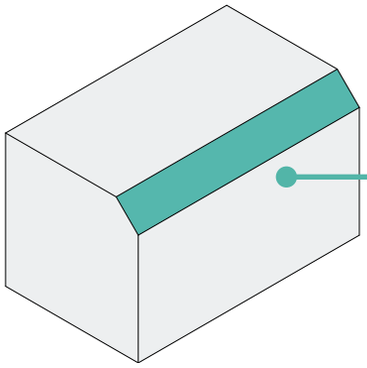
## **Winkelfräsen (Form A und Form C)** | Dovetail Milling (Form A and Form C)

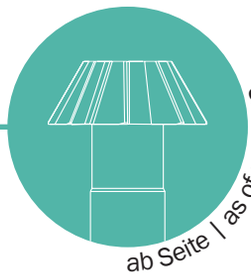




ab Seite | as of page **48**

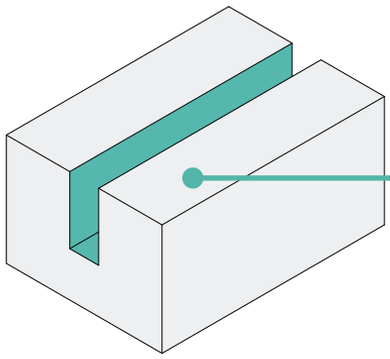
## **Winkelfräsen (Form B und Form D)** | Dovetail Milling (Form B and Form D)

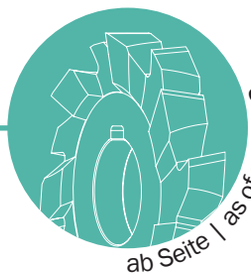




ab Seite | as of page **52**

## **Scheibenfräser** | Disc Milling Cutter





ab Seite | as of page **58**

# **Der Kaestner-Tools Nachschleifservice**
# The Kaestner-Tools Reconditioning Service

**Professionelle und nahezu originalgetreue Wiederaufbereitung ihrer Kaestner-Tools Werkzeuge.** | Professional and almost true to original reconditioning of your Kaestner-Tools precision tools.



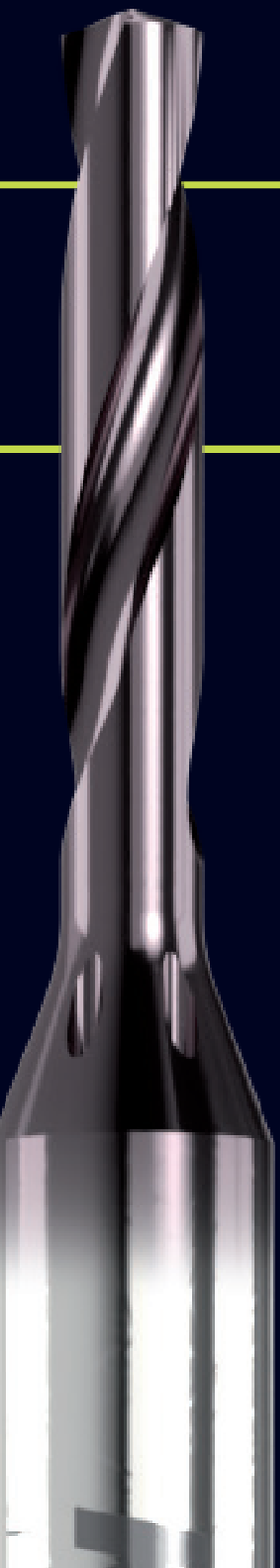
## **Ihre Vorteile** | Your advantages

- **Höchste Werkzeugleistung, Standzeit nahezu eines Neuwerkzeuges**
  Maximum tool performance, Service life of almost a new tool
- **Senkung der Werkzeug- und Produktionskosten**
  Reduction of tool and production costs
- **Hohe Prozesssicherheit**
  High process reliability
- **Schneller Service**
  Fast service
- **Geringerer Werkzeugvorrat**
  Lower tooling inventory
- **Wiederaufbereiten der Beschichtung**
  Reprocessing of the coating
- **Wiederverwenden in Hochleistungsqualität**
  Reuse in high performance quality

Für weitere Informationen steht Ihnen das Team der Kaestner-Tools unter **sales@kaestner.com** und **+49 36847 356 0** zur Verfügung oder besuchen Sie uns im Internet unter **www.kaestner-tools.de/nachschleifservice**

For further information please contact **sales@kaestner.com** and **+49 36847 356 0** or visit **www.kaestner-tools.de/reconditioning**

# Drill! **Bohren!** Mit Kaestner-Tools.
With Kaestner-Tools.



## **Pilotbohrer** | Pilot-drills
ab Seite | as of page **21**

## **Mikropräzisionsbohrer**
Micro precision-drills

**Seite | Page 23**
Mikropräzisionsbohrer, 3xD | Micro precision-drills, 3xD

**Seite | Page 25**
Mikropräzisionsbohrer, 5xD | Micro precision-drills, 5xD

**Seite | Page 27**
Mikropräzisionsbohrer, 8xD | Micro precision-drills, 8xD

**Seite | Page 29**
Mikropräzisionsbohrer, 12xD | Micro precision-drills, 12xD

# Pilotieren und Ansenken, 2xD

Pilotieren und Ansenken zur optimalen Vorbereitung nachfolgender Bohroperationen mit nur einem Werkzeug. Werkzeugaufnahme nach DIN 6535 HA.

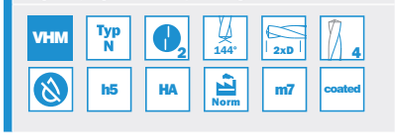
# Pilot drilling and chamfering, 2xD

Pilot drilling and chamfering for an ideal preparation of subsequent drilling operations with just one tool. Shank according to DIN 6535 HA.

Empfehlungen | Recommendations: **ab Seite | as of Page 63**

**E01 · E02 · E03 · H01.1**

Legende | Legend: **ab Seite | as of Page 62**



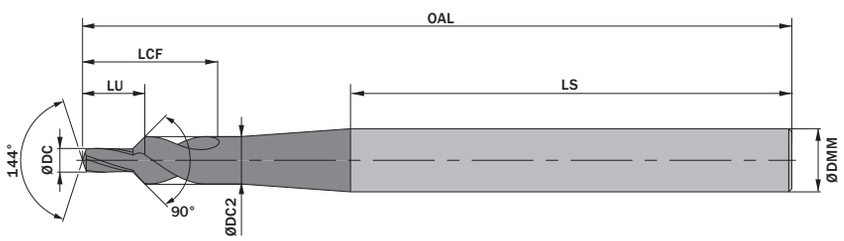




Abbildung ähnlich / Examplary image

| ØDC | ØDC2 | Artikelnummer Part number | Webcode | LU | LCF | ØDMM | LS | OAL | Vorschub f Feed f |
|---|---|---|---|---|---|---|---|---|---|
| mm | mm | | | mm | mm | mm | mm | mm | mm/U \| mm/r |
| 0,51 | 1,4 | **DS.DC11.0051.ZA** | A8EQ | 1,4 | 3,8 | 4,0 | 28,0 | 45,0 | 0,01 – 0,03 |
| 0,61 | 1,4 | **DS.DC11.0061.ZA** | A8ET | 1,6 | 4,0 | 4,0 | 28,0 | 45,0 | 0,01 – 0,03 |
| 0,71 | 1,6 | **DS.DC11.0071.ZA** | A8EV | 1,8 | 4,6 | 4,0 | 28,0 | 45,0 | 0,01 – 0,03 |
| 0,81 | 2,0 | **DS.DC11.0081.ZA** | A8EX | 2,2 | 5,6 | 4,0 | 28,0 | 45,0 | 0,01 – 0,03 |
| 0,91 | 2,0 | **DS.DC11.0091.ZA** | A8EZ | 2,3 | 5,8 | 4,0 | 28,0 | 45,0 | 0,01 – 0,03 |
| 1,01 | 2,0 | **DS.DC11.0101.ZA** | A8E1 | 2,5 | 6,0 | 4,0 | 28,0 | 45,0 | 0,01 – 0,03 |
| 1,11 | 2,5 | **DS.DC11.0111.ZA** | A8E3 | 2,9 | 7,2 | 4,0 | 28,0 | 45,0 | 0,01 – 0,03 |
| 1,21 | 2,5 | **DS.DC11.0121.ZA** | A8E5 | 3,0 | 7,4 | 4,0 | 28,0 | 45,0 | 0,01 – 0,03 |
| 1,31 | 2,5 | **DS.DC11.0131.ZA** | A8E7 | 3,2 | 7,6 | 4,0 | 28,0 | 45,0 | 0,01 – 0,03 |
| 1,41 | 2,5 | **DS.DC11.0141.ZA** | A8E9 | 3,3 | 7,8 | 4,0 | 28,0 | 45,0 | 0,01 – 0,03 |
| 1,51 | 3,0 | **DS.DC11.0151.ZA** | A8FB | 3,7 | 9,0 | 4,0 | 28,0 | 45,0 | 0,01 – 0,03 |
| 1,61 | 3,0 | **DS.DC11.0161.ZA** | A8FD | 3,9 | 9,2 | 4,0 | 28,0 | 45,0 | 0,01 – 0,03 |
| 1,71 | 3,0 | **DS.DC11.0171.ZA** | A8FF | 4,0 | 9,4 | 4,0 | 28,0 | 45,0 | 0,01 – 0,03 |
| 1,81 | 3,0 | **DS.DC11.0181.ZA** | A8FH | 4,2 | 9,6 | 4,0 | 28,0 | 45,0 | 0,01 – 0,03 |
| 1,91 | 3,0 | **DS.DC11.0191.ZA** | A8FK | 4,3 | 9,8 | 4,0 | 28,0 | 45,0 | 0,01 – 0,03 |

**Fortgesetzte Tabelle | Continued Table ►**

## Unsere Schneidstoff- und Schnittwertempfehlungen (Vc m/min) | Our cutting grade and cutting speed recommendations (Vc m/min)

Erklärung zu den Materialgruppen finden Sie auf Seite 69 | Explanations regarding the material groups can found on page 69

| Materialgruppen Material groups / Schneidstoff Cutting grade | P | | | | | | H | | K | | | M | | | S | | | | N | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PI | PII | PIII | PIV | PV | PVI | HI | HII | KI | KII | KIII | MI | MII | MIII | SI | SII | SIII | SIV | NI | NII | NIII | NIV | NV | NVI |
| **00 P343** | **105** | **115** | **80** | **75** | **55** | **55** | - | - | **125** | **110** | **105** | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **00 M347** | - | - | - | - | - | - | **60** | **20** | - | - | - | **30** | **40** | **30** | **20** | **20** | **20** | **25** | - | - | - | - | - | - |
| **00 N351** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **200** | **180** | **180** | **135** | **100** | - |
| **00 C372** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **120** | **80** |

Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade

Bestellbeispiel | Order example: **DS.BL15.0150.ZA 00 P343 oder A74N 00 P343** (00 P343 = Schneidstoff | Grade)

# Pilotieren und Ansenken, 2xD

Pilotieren und Ansenken zur optimalen Vorbereitung nachfolgender Bohroperationen mit nur einem Werkzeug. Werkzeugaufnahme nach DIN 6535 HA.

# Pilot drilling and chamfering, 2xD

Pilot drilling and chamfering for an ideal preparation of subsequent drilling operations with just one tool. Shank according to DIN 6535 HA.

Empfehlungen | Recommendations: **ab Seite | as of Page 63**

**E01 · E02 · E03 · H01.1**

Legende | Legend: **ab Seite | as of Page 62**

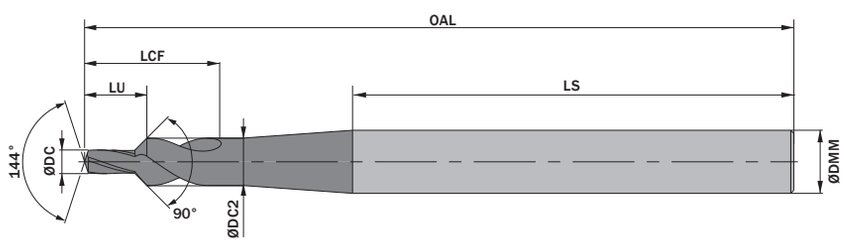



Abbildung ähnlich / Examplary image

| ØDC | ØDC2 | Artikelnummer Part number | Webcode | LU | LCF | ØDMM | LS | OAL | Vorschub f Feed f |
|---|---|---|---|---|---|---|---|---|---|
| mm | mm | | | mm | mm | mm | mm | mm | mm/U \| mm/r |
| ▶ **Fortgesetzte Tabelle \| Continued Table** | | | | | | | | | |
| **2,01** | **3,0** | **DS.DC11.0201.ZA** | A8FN | **4,5** | **10,0** | **4,0** | **28,0** | **45,0** | **0,01 – 0,03** |
| **2,11** | **3,0** | **DS.DC11.0211.ZA** | A8FQ | **4,6** | **10,2** | **4,0** | **28,0** | **45,0** | **0,01 – 0,03** |
| **2,21** | **3,0** | **DS.DC11.0221.ZA** | A8FT | **4,8** | **10,4** | **4,0** | **28,0** | **45,0** | **0,01 – 0,03** |
| **2,31** | **3,0** | **DS.DC11.0231.ZA** | A8FV | **4,9** | **10,6** | **4,0** | **28,0** | **45,0** | **0,01 – 0,03** |
| **2,41** | **3,0** | **DS.DC11.0241.ZA** | A8FX | **5,1** | **10,8** | **4,0** | **28,0** | **45,0** | **0,01 – 0,03** |
| **2,51** | **3,5** | **DS.DC11.0251.ZA** | A8FZ | **5,5** | **12,0** | **4,0** | **28,0** | **45,0** | **0,01 – 0,03** |
| **2,61** | **3,5** | **DS.DC11.0261.ZA** | A8F1 | **5,6** | **12,2** | **4,0** | **28,0** | **45,0** | **0,01 – 0,03** |
| **2,71** | **3,5** | **DS.DC11.0271.ZA** | A8F3 | **5,8** | **12,4** | **4,0** | **28,0** | **45,0** | **0,01 – 0,03** |
| **2,81** | **3,5** | **DS.DC11.0281.ZA** | A8F5 | **5,9** | **12,6** | **4,0** | **28,0** | **45,0** | **0,01 – 0,03** |
| **2,91** | **3,5** | **DS.DC11.0291.ZA** | A8F7 | **6,1** | **12,8** | **4,0** | **28,0** | **45,0** | **0,01 – 0,03** |
| **3,01** | **3,5** | **DS.DC11.0301.ZA** | A8F9 | **6,2** | **13,0** | **4,0** | **28,0** | **45,0** | **0,01 – 0,03** |

## Unsere Schneidstoff- und Schnittwertempfehlungen (Vc m/min) | Our cutting grade and cutting speed recommendations (Vc m/min)

Erklärung zu den Materialgruppen finden Sie auf Seite 69 | Explanations regarding the material groups can found on page 69

| Materialgruppen Material groups / Schneidstoff Cutting grade | P | | | | | | H | | K | | | M | | | S | | | | N | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PI | PII | PIII | PIV | PV | PVI | HI | HII | KI | KII | KIII | MI | MII | MIII | SI | SII | SIII | SIV | NI | NII | NIII | NIV | NV | NVI |
| **00 P343** | **105** | **115** | **80** | **75** | **55** | **55** | - | - | **125** | **110** | **105** | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **00 M347** | - | - | - | - | - | - | **60** | **20** | - | - | - | **30** | **40** | **30** | **20** | **20** | **20** | **25** | - | - | - | - | - | - |
| **00 N351** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **200** | **180** | **180** | **135** | **100** | - |
| **00 C372** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **120** | **80** |

Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade
Bestellbeispiel | Order example: **DS.BL15.0150.ZA 00 P343 oder A74N 00 P343** (00 P343 = Schneidstoff | Grade)

# Mikropräzisionsbohrer, 3xD

Mit Schaftaufnahme nach DIN 6535 HA und Schaftkühlung von Aussen über sechs Kühlkanäle. Bohrertoleranz m7 für eine Bohrungsqualität unter Normalbedingungen von H9. Präzisions-Spitzenanschliff mit optimierter Schneidengeometrie.

# Micro precision-drills, 3xD

Shank according to DIN 6535 HA with external shank cooling via six coolant channels. Drill tolerance m7 for a bore quality of H9 at normal conditions. Precision point cut with optimized cutting edge geometry.

Empfehlungen | Recommendations: **ab Seite | as of Page 63**

**E01 · E02 · H01.1**

Legende | Legend: **ab Seite | as of Page 62**



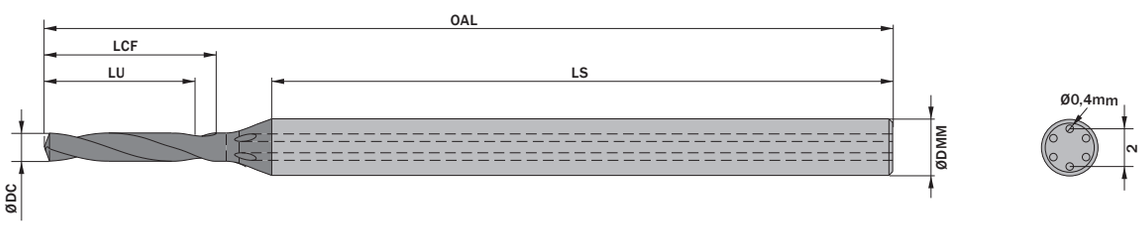




Abbildung ähnlich / Examplary image : DS.AL.12.0150.ZA

| ØDC | Artikelnummer Part number | Webcode | LU | LCF | ØDMM | LS | OAL | Vorschub f Feed f |
|---|---|---|---|---|---|---|---|---|
| mm | | | mm | mm | mm | mm | mm | mm/U \| mm/r |
| 0,5 | **DS.AL12.0050.ZA** | A7YX | 1,5 | 2,0 | 3,0 | 28,0 | 45,0 | 0,02 – 0,04 |
| 0,6 | **DS.AL12.0060.ZA** | A7YZ | 1,8 | 3,0 | 3,0 | 28,0 | 45,0 | 0,02 – 0,04 |
| 0,7 | **DS.AL12.0070.ZA** | A7Y1 | 2,1 | 3,0 | 3,0 | 28,0 | 45,0 | 0,02 – 0,04 |
| 0,8 | **DS.AL12.0080.ZA** | A7Y3 | 2,4 | 4,0 | 3,0 | 28,0 | 45,0 | 0,02 – 0,04 |
| 0,9 | **DS.AL12.0090.ZA** | A7Y5 | 2,7 | 4,0 | 3,0 | 28,0 | 45,0 | 0,02 – 0,04 |
| 1,0 | **DS.AL12.0100.ZA** | A7Y7 | 3,0 | 4,0 | 3,0 | 28,0 | 45,0 | 0,02 – 0,04 |
| 1,1 | **DS.AL12.0110.ZA** | A7Y9 | 3,3 | 5,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,07 |
| 1,2 | **DS.AL12.0120.ZA** | A7ZB | 3,6 | 5,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,07 |
| 1,3 | **DS.AL12.0130.ZA** | A7ZD | 3,9 | 5,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,07 |
| 1,4 | **DS.AL12.0140.ZA** | A7ZF | 4,2 | 6,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,07 |
| 1,5 | **DS.AL12.0150.ZA** | A7ZH | 4,5 | 6,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,07 |

## Unsere Schneidstoff- und Schnittwertempfehlungen (Vc m/min) | Our cutting grade and cutting speed recommendations (Vc m/min)

Erklärung zu den Materialgruppen finden Sie auf Seite 69 | Explanations regarding the material groups can found on page 69

| Materialgruppen Material groups / Schneidstoff Cutting grade | P | | | | | | H | | K | | | M | | | S | | | | N | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PI | PII | PIII | PIV | PV | PVI | HI | HII | KI | KII | KIII | MI | MII | MIII | SI | SII | SIII | SIV | NI | NII | NIII | NIV | NV | NVI |
| **00 P343** | **105** | **115** | **80** | **75** | **55** | **55** | - | - | **125** | **110** | **105** | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **00 M347** | - | - | - | - | - | - | **60** | **20** | - | - | - | **30** | **40** | **30** | **20** | **20** | **20** | **25** | - | - | - | - | - | - |
| **00 N351** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **200** | **180** | **180** | **135** | **100** | - |
| **00 C372** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **120** | **80** |

Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade

Bestellbeispiel | Order example: **DS.AL12.0050.ZA 00 P343 oder A7YX 00 P343** (00 P343 = Schneidstoff | Grade)

# Mikropräzisionsbohrer, 3xD

Mit Schaftaufnahme nach DIN 6535 HA und Schaftkühlung Innen über zwei verdrallte Kühlkanäle. Bohrertoleranz m7 für eine Bohrungsqualität unter Normalbedingungen von H9. Präzisions-Spitzenanschliff mit optimierter Schneidengeometrie. Zuverlässige Kühlmittelzufuhr dank optimierter Transportkammer im Schaft.

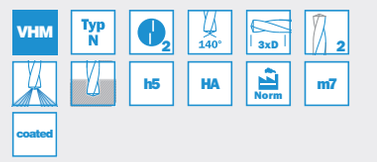
# Micro precision-drills, 3xD

Shank according to DIN 6535 HA with internal shank cooling via two twisted cooling channels. Drill tolerance m7 for a bore quality of H9 at normal conditions. Precision point cut with optimized cutting geometry. Reliable coolant supply thanks to an optimized transport chamber within the shank.

Empfehlungen | Recommendations: **ab Seite | as of Page 63**

**E01 · E02 · H01.1**

Legende | Legend: **ab Seite | as of Page 62**



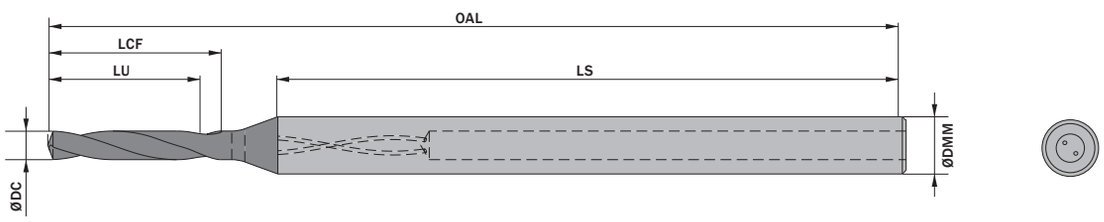




Abbildung ähnlich / Examplary image: DS.BL.12.0150.ZA

| ØDC | Artikelnummer Part number | Webcode | LU | LCF | ØDMM | LS | OAL | Vorschub f Feed f |
|---|---|---|---|---|---|---|---|---|
| mm | | | mm | mm | mm | mm | mm | mm/U \| mm/r |
| 1,5 | **DS.BL12.0150.ZA** | A7ZK | 4,5 | 6,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,07 |
| 1,6 | **DS.BL12.0160.ZA** | A7ZN | 4,8 | 7,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,07 |
| 1,7 | **DS.BL12.0170.ZA** | A7ZQ | 5,1 | 7,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,07 |
| 1,8 | **DS.BL12.0180.ZA** | A7ZT | 5,4 | 7,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,07 |
| 1,9 | **DS.BL12.0190.ZA** | A7ZV | 5,7 | 8,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,07 |
| 2,0 | **DS.BL12.0200.ZA** | A7ZX | 6,0 | 8,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,07 |
| 2,1 | **DS.BL12.0210.ZA** | A7ZZ | 6,3 | 8,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,10 |
| 2,2 | **DS.BL12.0220.ZA** | A7Z1 | 6,6 | 9,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,10 |
| 2,3 | **DS.BL12.0230.ZA** | A7Z3 | 6,9 | 9,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,10 |
| 2,4 | **DS.BL12.0240.ZA** | A7Z5 | 7,2 | 10,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,10 |
| 2,5 | **DS.BL12.0250.ZA** | A7Z7 | 7,5 | 10,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,10 |
| 2,6 | **DS.BL12.0260.ZA** | A7Z9 | 7,8 | 10,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,10 |
| 2,7 | **DS.BL12.0270.ZA** | A70B | 8,1 | 11,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,10 |
| 2,8 | **DS.BL12.0280.ZA** | A70D | 8,4 | 11,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,10 |
| 2,9 | **DS.BL12.0290.ZA** | A70F | 8,7 | 12,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,10 |
| 3,0 | **DS.BL12.0300.ZA** | A70H | 9,0 | 12,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,10 |

## Unsere Schneidstoff- und Schnittwertempfehlungen (Vc m/min) | Our cutting grade and cutting speed recommendations (Vc m/min)

Erklärung zu den Materialgruppen finden Sie auf Seite 69 | Explanations regarding the material groups can found on page 69

| Materialgruppen Material groups / Schneidstoff Cutting grade | P | | | | | | H | | K | | | M | | | S | | | | N | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PI | PII | PIII | PIV | PV | PVI | HI | HII | KI | KII | KIII | MI | MII | MIII | SI | SII | SIII | SIV | NI | NII | NIII | NIV | NV | NVI |
| **00 P343** | **105** | **115** | **80** | **75** | **55** | **55** | - | - | **125** | **110** | **105** | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **00 M347** | - | - | - | - | - | - | **60** | **20** | - | - | - | **30** | **40** | **30** | **20** | **20** | **20** | **25** | - | - | - | - | - | - |
| **00 N351** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **200** | **180** | **180** | **135** | **100** | - |
| **00 C372** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **120** | **80** |

Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade
Bestellbeispiel | Order example: **DS.BL12.0150.ZA 00 P343 oder A7ZK 00 P343** (00 P343 = Schneidstoff | Grade)

# Mikropräzisionsbohrer, 5xD

Mit Schaftaufnahme nach DIN 6535 HA und Schaftkühlung von Aussen über sechs Kühlkanäle. Bohrertoleranz m7 für eine Bohrungsqualität unter Normalbedingungen von H9. Präzisions-Spitzenanschliff mit optimierter Schneidengeometrie.

# Micro precision-drills, 5xD

Shank according to DIN 6535 HA with external shank cooling via six coolant channels. Drill tolerance m7 for a bore quality of H9 at normal conditions. Precision point cut with optimized cutting edge geometry.

Empfehlungen | Recommendations: **ab Seite | as of Page 63**

**E01 · E02 · H01.1**

Legende | Legend: **ab Seite | as of Page 62**

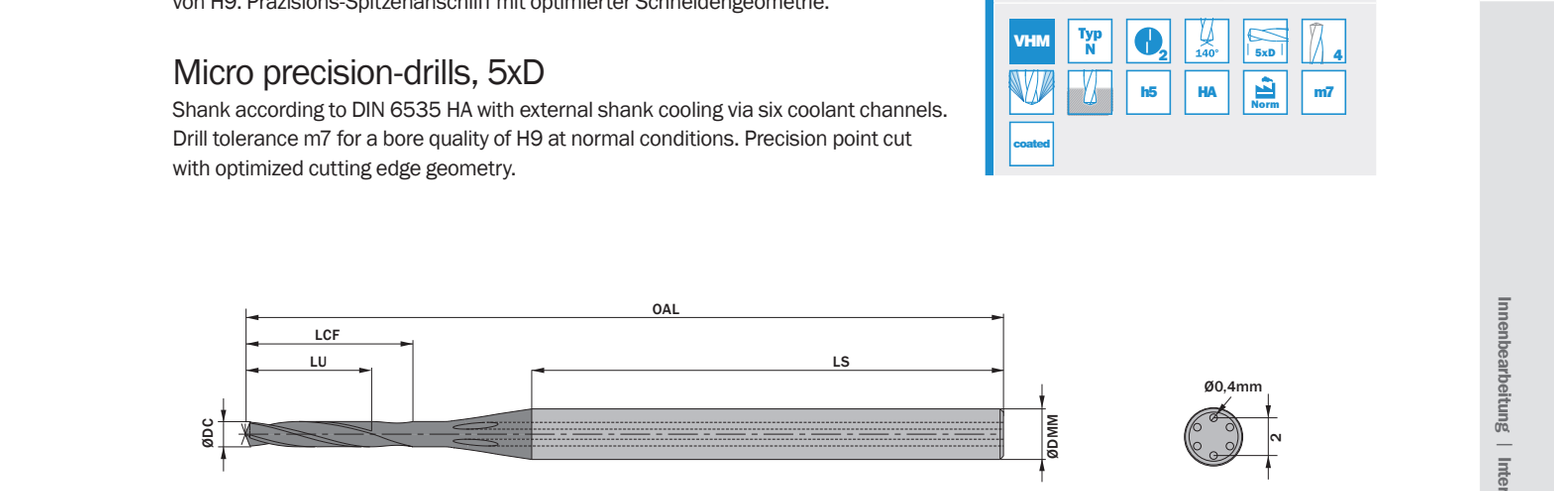






Abbildung ähnlich / Examplary image

| ØDC | Artikelnummer Part number | Webcode | LU | LCF | ØDMM | LS | OAL | Vorschub f Feed f |
|---|---|---|---|---|---|---|---|---|
| mm | | | mm | mm | mm | mm | mm | mm/U \| mm/r |
| 0,5 | **DS.AL13.0050.ZA** | A70K | 2,5 | 3,0 | 3,0 | 28,0 | 45,0 | 0,02 – 0,04 |
| 0,6 | **DS.AL13.0060.ZA** | A70N | 3,0 | 4,0 | 3,0 | 28,0 | 45,0 | 0,02 – 0,04 |
| 0,7 | **DS.AL13.0070.ZA** | A70Q | 3,5 | 5,0 | 3,0 | 28,0 | 45,0 | 0,02 – 0,04 |
| 0,8 | **DS.AL13.0080.ZA** | A70T | 4,0 | 5,0 | 3,0 | 28,0 | 45,0 | 0,02 – 0,04 |
| 0,9 | **DS.AL13.0090.ZA** | A70V | 4,5 | 6,0 | 3,0 | 28,0 | 45,0 | 0,02 – 0,04 |
| 1,0 | **DS.AL13.0100.ZA** | A70X | 5,0 | 6,0 | 3,0 | 28,0 | 45,0 | 0,02 – 0,04 |
| 1,1 | **DS.AL13.0110.ZA** | A70Z | 5,5 | 7,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,07 |
| 1,2 | **DS.AL13.0120.ZA** | A701 | 6,0 | 7,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,07 |
| 1,3 | **DS.AL13.0130.ZA** | A703 | 6,5 | 8,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,07 |
| 1,4 | **DS.AL13.0140.ZA** | A705 | 7,0 | 9,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,07 |
| 1,5 | **DS.AL13.0150.ZA** | A707 | 7,5 | 9,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,07 |

**Unsere Schneidstoff- und Schnittwertempfehlungen (Vc m/min) | Our cutting grade and cutting speed recommendations (Vc m/min)**

Erklärung zu den Materialgruppen finden Sie auf Seite 69 | Explanations regarding the material groups can found on page 69

| Materialgruppen Material groups / Schneidstoff Cutting grade | P | | | | | | H | | K | | | M | | | S | | | | N | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PI | PII | PIII | PIV | PV | PVI | HI | HII | KI | KII | KIII | MI | MII | MIII | SI | SII | SIII | SIV | NI | NII | NIII | NIV | NV | NVI |
| **00 P343** | **105** | **115** | **80** | **75** | **55** | **55** | - | - | **125** | **110** | **105** | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **00 M347** | - | - | - | - | - | - | **60** | **20** | - | - | - | **30** | **40** | **30** | **20** | **20** | **20** | **25** | - | - | - | - | - | - |
| **00 N351** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **200** | **180** | **180** | **135** | **100** | - |
| **00 C372** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **120** | **80** |

Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade

Bestellbeispiel | Order example: **DS.AL13.0050.ZA 00 P343 oder A70K 00 P343** (00 P343 = Schneidstoff | Grade)

# Mikropräzisionsbohrer, 5xD

Mit Schaftaufnahme nach DIN 6535 HA und Schaftkühlung Innen über zwei verdrallte Kühlkanäle. Bohrertoleranz m7 für eine Bohrungsqualität unter Normalbedingungen von H9. Präzisions-Spitzenanschliff mit optimierter Schneidengeometrie. Zuverlässige Kühlmittelzufuhr dank optimierter Transportkammer im Schaft.

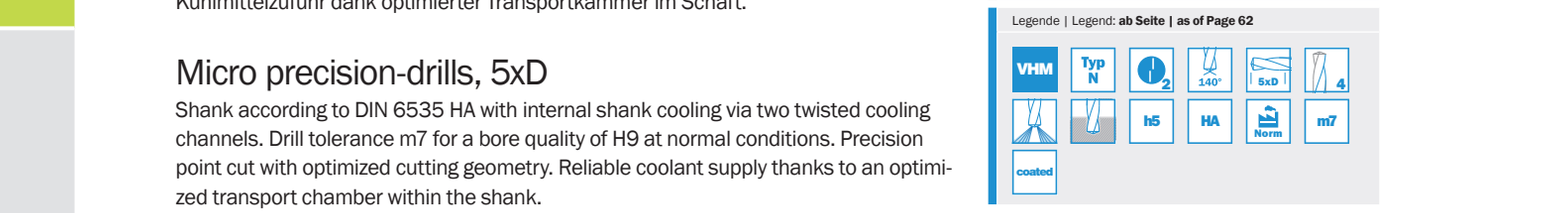
# Micro precision-drills, 5xD

Shank according to DIN 6535 HA with internal shank cooling via two twisted cooling channels. Drill tolerance m7 for a bore quality of H9 at normal conditions. Precision point cut with optimized cutting geometry. Reliable coolant supply thanks to an optimized transport chamber within the shank.

Empfehlungen | Recommendations: **ab Seite | as of Page 63**

**E01 · E02 · H01.1**

Legende | Legend: **ab Seite | as of Page 62**



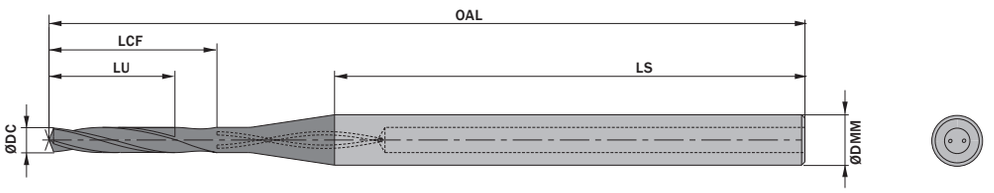




Abbildung ähnlich / Examplary image

| ØDC | Artikelnummer Part number | Webcode | LU | LCF | ØDMM | LS | OAL | Vorschub f Feed f |
|---|---|---|---|---|---|---|---|---|
| mm | | | mm | mm | mm | mm | mm | mm/U \| mm/r |
| 1,5 | **DS.BL13.0150.ZA** | A709 | 7,5 | 9,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,07 |
| 1,6 | **DS.BL13.0160.ZA** | A71B | 8,0 | 10,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,07 |
| 1,7 | **DS.BL13.0170.ZA** | A71D | 8,5 | 10,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,07 |
| 1,8 | **DS.BL13.0180.ZA** | A71F | 9,0 | 11,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,07 |
| 1,9 | **DS.BL13.0190.ZA** | A71H | 9,5 | 12,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,07 |
| 2,0 | **DS.BL13.0200.ZA** | A71K | 10,0 | 12,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,07 |
| 2,1 | **DS.BL13.0210.ZA** | A71N | 10,5 | 13,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,10 |
| 2,2 | **DS.BL13.0220.ZA** | A71Q | 11,0 | 13,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,10 |
| 2,3 | **DS.BL13.0230.ZA** | A71T | 11,5 | 14,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,10 |
| 2,4 | **DS.BL13.0240.ZA** | A71V | 12,0 | 14,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,10 |
| 2,5 | **DS.BL13.0250.ZA** | A71X | 12,5 | 15,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,10 |
| 2,6 | **DS.BL13.0260.ZA** | A71Z | 13,0 | 16,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,10 |
| 2,7 | **DS.BL13.0270.ZA** | A711 | 13,5 | 16,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,10 |
| 2,8 | **DS.BL13.0280.ZA** | A713 | 14,0 | 17,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,10 |
| 2,9 | **DS.BL13.0290.ZA** | A715 | 14,5 | 17,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,10 |
| 3,0 | **DS.BL13.0300.ZA** | A717 | 15,0 | 18,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,10 |

## Unsere Schneidstoff- und Schnittwertempfehlungen (Vc m/min) | Our cutting grade and cutting speed recommendations (Vc m/min)

Erklärung zu den Materialgruppen finden Sie auf Seite 69 | Explanations regarding the material groups can found on page 69

| Materialgruppen Material groups / Schneidstoff Cutting grade | P | | | | | | H | | K | | | M | | | S | | | | N | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PI | PII | PIII | PIV | PV | PVI | HI | HII | KI | KII | KIII | MI | MII | MIII | SI | SII | SIII | SIV | NI | NII | NIII | NIV | NV | NVI |
| **00 P343** | **105** | **115** | **80** | **75** | **55** | **55** | - | - | **125** | **110** | **105** | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **00 M347** | - | - | - | - | - | - | **60** | **20** | - | - | - | **30** | **40** | **30** | **20** | **20** | **20** | **25** | - | - | - | - | - | - |
| **00 N351** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **200** | **180** | **180** | **135** | **100** | - |
| **00 C372** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **120** | **80** |

Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade

Bestellbeispiel | Order example: **DS.BL13.0150.ZA 00 P343 oder A709 00 P343** (00 P343 = Schneidstoff | Grade)

# Mikropräzisionsbohrer, 8xD

Mit Schaftaufnahme nach DIN 6535 HA und Schaftkühlung von Aussen über sechs Kühlkanäle. Bohrertoleranz m7 für eine Bohrungsqualität unter Normalbedingungen von H9. Präzisions-Spitzenanschliff mit optimierter Schneidengeometrie.

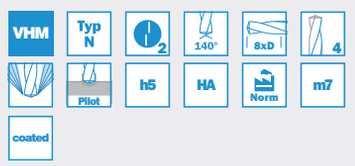
# Micro precision-drills, 8xD

Shank according to DIN 6535 HA with external shank cooling via six coolant channels. Drill tolerance m7 for a bore quality of H9 at normal conditions. Precision point cut with optimized cutting edge geometry.

Empfehlungen | Recommendations: **ab Seite | as of Page 63**

**E01 · E02 · E03 · H01.1**

Legende | Legend: **ab Seite | as of Page 62**



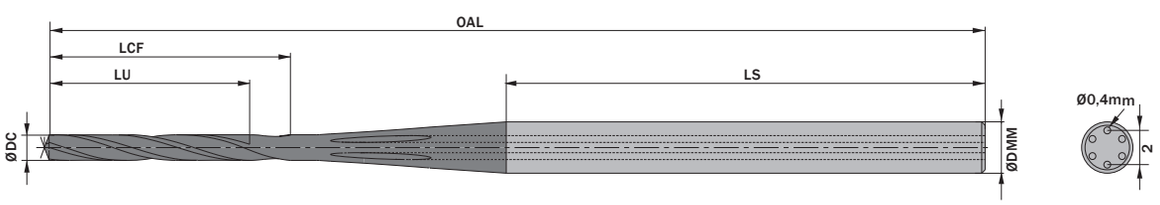




Abbildung ähnlich / Examplary image

Zur Verwendung dieser Mikropräzisionsbohrer wird eine vorgelagerte Pilotbohrung empfohlen. Geeignete Pilotbohrer finden Sie **ab Seite 21** | We recommend a preceding pilot drill for the usage of these micro precision-drills. You can find suitable pilot drills **as of page 21**

| ØDC<br>mm | Artikelnummer<br>Part number | Webcode | LU<br>mm | LCF<br>mm | ØDMM<br>mm | LS<br>mm | OAL<br>mm | Vorschub f<br>Feed f<br>mm/U \| mm/r |
|---|---|---|---|---|---|---|---|---|
| 0,5 | **DS.AL14.0050.ZA** | A719 | 4,0 | 5,0 | 3,0 | 28,0 | 45,0 | 0,02 – 0,04 |
| 0,6 | **DS.AL14.0060.ZA** | A72B | 4,8 | 6,0 | 3,0 | 28,0 | 45,0 | 0,02 – 0,04 |
| 0,7 | **DS.AL14.0070.ZA** | A72D | 5,6 | 7,0 | 3,0 | 28,0 | 45,0 | 0,02 – 0,04 |
| 0,8 | **DS.AL14.0080.ZA** | A72F | 6,4 | 8,0 | 3,0 | 28,0 | 45,0 | 0,02 – 0,04 |
| 0,9 | **DS.AL14.0090.ZA** | A72H | 7,2 | 8,0 | 3,0 | 28,0 | 45,0 | 0,02 – 0,04 |
| 1,0 | **DS.AL14.0100.ZA** | A72K | 8,0 | 9,0 | 3,0 | 28,0 | 45,0 | 0,02 – 0,04 |
| 1,1 | **DS.AL14.0110.ZA** | A72N | 8,8 | 10,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,07 |
| 1,2 | **DS.AL14.0120.ZA** | A72Q | 9,6 | 11,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,07 |
| 1,3 | **DS.AL14.0130.ZA** | A72T | 10,4 | 12,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,07 |
| 1,4 | **DS.AL14.0140.ZA** | A72V | 11,2 | 13,0 | 3,0 | 28,0 | 45,0 | 0,03 – 0,07 |
| 1,5 | **DS.AL14.0150.ZA** | A72X | 12,0 | 14,0 | 3,0 | 28,0 | 55,0 | 0,03 – 0,07 |

## Unsere Schneidstoff- und Schnittwertempfehlungen (Vc m/min) | Our cutting grade and cutting speed recommendations (Vc m/min)

Erklärung zu den Materialgruppen finden Sie auf Seite 69 | Explanations regarding the material groups can found on page 69

| Materialgruppen / Material groups<br>Schneidstoff / Cutting grade | P | | | | | | H | | K | | | M | | | S | | | | N | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PI | PII | PIII | PIV | PV | PVI | HI | HII | KI | KII | KIII | MI | MII | MIII | SI | SII | SIII | SIV | NI | NII | NIII | NIV | NV | NVI |
| **00 P343** | **105** | **115** | **80** | **75** | **55** | **55** | - | - | **125** | **110** | **105** | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **00 M347** | - | - | - | - | - | - | **60** | **20** | - | - | - | **30** | **40** | **30** | **20** | **20** | **20** | **25** | - | - | - | - | - | - |
| **00 N351** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **200** | **180** | **180** | **135** | **100** | - |
| **00 C372** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **120** | **80** |

Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade
Bestellbeispiel | Order example: **DS.AL14.0050.ZA 00 P343 oder A719 00 P343** (00 P343 = Schneidstoff | Grade)

# Mikropräzisionsbohrer, 8xD

Mit Schaftaufnahme nach DIN 6535 HA und Schaftkühlung Innen über zwei verdrallte Kühlkanäle. Bohrertoleranz m7 für eine Bohrungsqualität unter Normalbedingungen von H9. Präzisions-Spitzenanschliff mit optimierter Schneidengeometrie. Zuverlässige Kühlmittelzufuhr dank optimierter Transportkammer im Schaft.

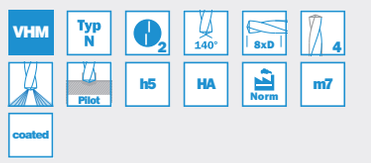
# Micro precision-drills, 8xD

Shank according to DIN 6535 HA with internal shank cooling via two twisted cooling channels. Drill tolerance m7 for a bore quality of H9 at normal conditions. Precision point cut with optimized cutting geometry. Reliable coolant supply thanks to an optimized transport chamber within the shank.

Empfehlungen | Recommendations: **ab Seite | as of Page 63**

**E01 · E02 · E03 · H01.1**

Legende | Legend: **ab Seite | as of Page 62**



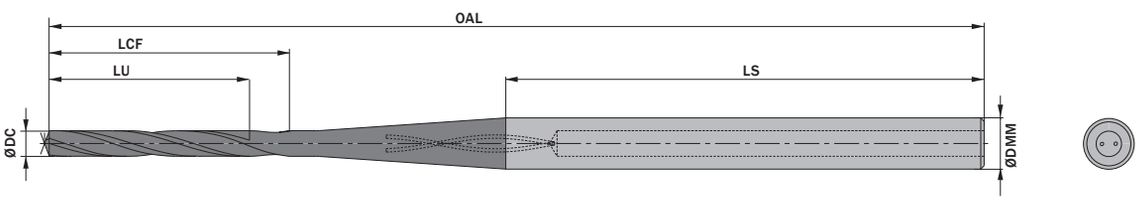




Abbildung ähnlich / Examplary image

Zur Verwendung dieser Mikropräzisionsbohrer wird eine vorgelagerte Pilotbohrung empfohlen. Geeignete Pilotbohrer finden Sie **ab Seite 21** | We recommend a preceding pilot drill for the usage of these micro precision-drills. You can find suitable pilot drills **as of page 21**

| ØDC | Artikelnummer Part number | Webcode | LU | LCF | ØDMM | LS | OAL | Vorschub f Feed f |
|---|---|---|---|---|---|---|---|---|
| mm | | | mm | mm | mm | mm | mm | mm/U \| mm/r |
| 1,5 | **DS.BL14.0150.ZA** | A72Z | 12,0 | 14,0 | 3,0 | 28,0 | 55,0 | 0,03 – 0,07 |
| 1,6 | **DS.BL14.0160.ZA** | A721 | 12,8 | 15,0 | 3,0 | 28,0 | 55,0 | 0,03 – 0,07 |
| 1,7 | **DS.BL14.0170.ZA** | A723 | 13,6 | 15,0 | 3,0 | 28,0 | 55,0 | 0,03 – 0,07 |
| 1,8 | **DS.BL14.0180.ZA** | A725 | 14,4 | 16,0 | 3,0 | 28,0 | 55,0 | 0,03 – 0,07 |
| 1,9 | **DS.BL14.0190.ZA** | A727 | 15,2 | 17,0 | 3,0 | 28,0 | 55,0 | 0,03 – 0,07 |
| 2,0 | **DS.BL14.0200.ZA** | A729 | 16,0 | 18,0 | 3,0 | 28,0 | 55,0 | 0,03 – 0,07 |
| 2,1 | **DS.BL14.0210.ZA** | A73B | 16,8 | 19,0 | 3,0 | 28,0 | 55,0 | 0,03 – 0,10 |
| 2,2 | **DS.BL14.0220.ZA** | A73D | 17,6 | 20,0 | 3,0 | 28,0 | 55,0 | 0,03 – 0,10 |
| 2,3 | **DS.BL14.0230.ZA** | A73F | 18,4 | 21,0 | 3,0 | 28,0 | 55,0 | 0,03 – 0,10 |
| 2,4 | **DS.BL14.0240.ZA** | A73H | 19,2 | 22,0 | 3,0 | 28,0 | 55,0 | 0,03 – 0,10 |
| 2,5 | **DS.BL14.0250.ZA** | A73K | 20,0 | 22,0 | 3,0 | 28,0 | 55,0 | 0,03 – 0,10 |
| 2,6 | **DS.BL14.0260.ZA** | A73N | 20,8 | 23,0 | 3,0 | 28,0 | 55,0 | 0,03 – 0,10 |
| 2,7 | **DS.BL14.0270.ZA** | A73Q | 21,6 | 24,0 | 3,0 | 28,0 | 55,0 | 0,03 – 0,10 |
| 2,8 | **DS.BL14.0280.ZA** | A73T | 22,4 | 25,0 | 3,0 | 28,0 | 55,0 | 0,03 – 0,10 |
| 2,9 | **DS.BL14.0290.ZA** | A73V | 23,2 | 26,0 | 3,0 | 28,0 | 55,0 | 0,03 – 0,10 |
| 3,0 | **DS.BL14.0300.ZA** | A73X | 24,0 | 27,0 | 3,0 | 28,0 | 55,0 | 0,03 – 0,10 |

## Unsere Schneidstoff- und Schnittwertempfehlungen (Vc m/min) | Our cutting grade and cutting speed recommendations (Vc m/min)

Erklärung zu den Materialgruppen finden Sie auf Seite 69 | Explanations regarding the material groups can found on page 69

| Materialgruppen Material groups / Schneidstoff Cutting grade | P | | | | | | H | | K | | | M | | | S | | | | N | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PI | PII | PIII | PIV | PV | PVI | HI | HII | KI | KII | KIII | MI | MII | MIII | SI | SII | SIII | SIV | NI | NII | NIII | NIV | NV | NVI |
| **00 P343** | **105** | **115** | **80** | **75** | **55** | **55** | - | - | **125** | **110** | **105** | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **00 M347** | - | - | - | - | - | - | **60** | **20** | - | - | - | **30** | **40** | **30** | **20** | **20** | **20** | **25** | - | - | - | - | - | - |
| **00 N351** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **200** | **180** | **180** | **135** | **100** | - |
| **00 C372** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **120** | **80** |

Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade
Bestellbeispiel | Order example: **DS.BL14.0150.ZA 00 P343 oder A72Z 00 P343** (00 P343 = Schneidstoff | Grade)

# Mikropräzisionsbohrer, 12xD

Mit Schaftaufnahme nach DIN 6535 HA und Schaftkühlung von Aussen über sechs Kühlkanäle. Bohrertoleranz m7 für eine Bohrungsqualität unter Normalbedingungen von H9. Präzisions-Spitzenanschliff mit optimierter Schneidengeometrie.

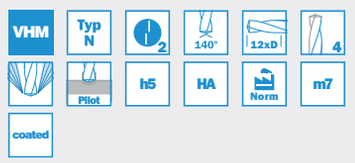
# Micro precision-drills, 12xD

Shank according to DIN 6535 HA with external shank cooling via six coolant channels. Drill tolerance m7 for a bore quality of H9 at normal conditions. Precision point cut with optimized cutting edge geometry.

Empfehlungen | Recommendations: **ab Seite | as of Page 63**

**E01 · E02 · E03 · H01.1**

Legende | Legend: **ab Seite | as of Page 62**



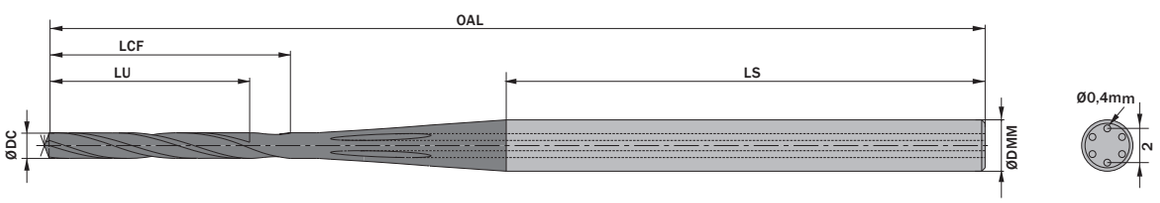




Abbildung ähnlich / Examplary image

Zur Verwendung dieser Mikropräzisionsbohrer wird eine vorgelagerte Pilotbohrung empfohlen. Geeignete Pilotbohrer finden Sie **ab Seite 21** | We recommend a preceding pilot drill for the usage of these micro precision-drills. You can find suitable pilot drills **as of page 21**

| ØDC | Artikelnummer Part number | Webcode | LU | LCF | ØDMM | LS | OAL | Vorschub f Feed f |
|---|---|---|---|---|---|---|---|---|
| mm | | | mm | mm | mm | mm | mm | mm/U \| mm/r |
| 0,5 | **DS.AL15.0050.ZA** | A73Z | 6,0 | 7,0 | 3,0 | 28,0 | 45,0 | 0,02 – 0,04 |
| 0,6 | **DS.AL15.0060.ZA** | A731 | 7,2 | 8,0 | 3,0 | 28,0 | 45,0 | 0,02 – 0,04 |
| 0,7 | **DS.AL15.0070.ZA** | A733 | 8,4 | 9,0 | 3,0 | 28,0 | 45,0 | 0,02 – 0,04 |
| 0,8 | **DS.AL15.0080.ZA** | A735 | 9,6 | 11,0 | 3,0 | 28,0 | 45,0 | 0,02 – 0,04 |
| 0,9 | **DS.AL15.0090.ZA** | A737 | 10,8 | 12,0 | 3,0 | 28,0 | 45,0 | 0,02 – 0,04 |
| 1,0 | **DS.AL15.0100.ZA** | A739 | 12,0 | 13,0 | 3,0 | 28,0 | 55,0 | 0,02 – 0,04 |
| 1,1 | **DS.AL15.0110.ZA** | A74B | 13,2 | 15,0 | 3,0 | 28,0 | 55,0 | 0,03 – 0,07 |
| 1,2 | **DS.AL15.0120.ZA** | A74D | 14,4 | 16,0 | 3,0 | 28,0 | 55,0 | 0,03 – 0,07 |
| 1,3 | **DS.AL15.0130.ZA** | A74F | 15,6 | 17,0 | 3,0 | 28,0 | 55,0 | 0,03 – 0,07 |
| 1,4 | **DS.AL15.0140.ZA** | A74H | 16,8 | 18,0 | 3,0 | 28,0 | 55,0 | 0,03 – 0,07 |
| 1,5 | **DS.AL15.0150.ZA** | A74K | 18,0 | 20,0 | 3,0 | 28,0 | 55,0 | 0,03 – 0,07 |

## Unsere Schneidstoff- und Schnittwertempfehlungen (Vc m/min) | Our cutting grade and cutting speed recommendations (Vc m/min)

Erklärung zu den Materialgruppen finden Sie auf Seite 69 | Explanations regarding the material groups can found on page 69

| Materialgruppen Material groups / Schneidstoff Cutting grade | P | | | | | | H | | K | | | M | | | S | | | | N | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PI | PII | PIII | PIV | PV | PVI | HI | HII | KI | KII | KIII | MI | MII | MIII | SI | SII | SIII | SIV | NI | NII | NIII | NIV | NV | NVI |
| **00 P343** | **105** | **115** | **80** | **75** | **55** | **55** | - | - | **125** | **110** | **105** | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **00 M347** | - | - | - | - | - | - | **60** | **20** | - | - | - | **30** | **40** | **30** | **20** | **20** | **20** | **25** | - | - | - | - | - | - |
| **00 N351** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **200** | **180** | **180** | **135** | **100** | - |
| **00 C372** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **120** | **80** |

Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade
Bestellbeispiel | Order example: **DS.AL15.0050.ZA 00 P343 oder A73Z 00 P343** (00 P343 = Schneidstoff | Grade)

# Mikropräzisionsbohrer, 12xD

Mit Schaftaufnahme nach DIN 6535 HA und Schaftkühlung Innen über zwei verdrallte Kühlkanäle. Bohrertoleranz m7 für eine Bohrungsqualität unter Normalbedingungen von H9. Präzisions-Spitzenanschliff mit optimierter Schneidengeometrie. Zuverlässige Kühlmittelzufuhr dank optimierter Transportkammer im Schaft.

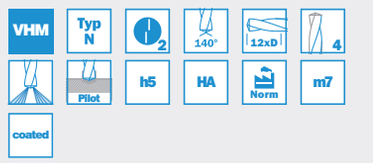
# Micro precision-drills, 12xD

Shank according to DIN 6535 HA with internal shank cooling via two twisted cooling channels. Drill tolerance m7 for a bore quality of H9 at normal conditions. Precision point cut with optimized cutting geometry. Reliable coolant supply thanks to an optimized transport chamber within the shank.

Empfehlungen | Recommendations: **ab Seite | as of Page 63**

**E01 · E02 · E03 · H01.1**

Legende | Legend: **ab Seite | as of Page 62**



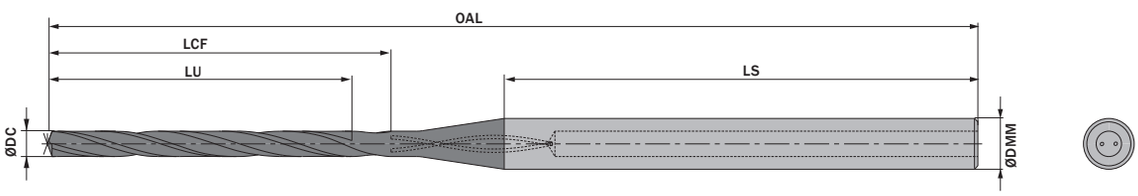




Abbildung ähnlich / Examplary image

Zur Verwendung dieser Mikropräzisionsbohrer wird eine vorgelagerte Pilotbohrung empfohlen. Geeignete Pilotbohrer finden Sie **ab Seite 21** | We recommend a preceding pilot drill for the usage of these micro precision-drills. You can find suitable pilot drills **as of page 21**

| ØDC | Artikelnummer Part number | Webcode | LU | LCF | ØDMM | LS | OAL | Vorschub f Feed f |
|---|---|---|---|---|---|---|---|---|
| mm | | | mm | mm | mm | mm | mm | mm/U \| mm/r |
| 1,5 | **DS.BL15.0150.ZA** | A74N | 18,0 | 20,0 | 3,0 | 28,0 | 55,0 | 0,03 – 0,07 |
| 1,6 | **DS.BL15.0160.ZA** | A74Q | 19,2 | 21,0 | 3,0 | 28,0 | 55,0 | 0,03 – 0,07 |
| 1,7 | **DS.BL15.0170.ZA** | A74T | 20,4 | 22,0 | 3,0 | 28,0 | 55,0 | 0,03 – 0,07 |
| 1,8 | **DS.BL15.0180.ZA** | A74V | 21,6 | 24,0 | 3,0 | 28,0 | 55,0 | 0,03 – 0,07 |
| 1,9 | **DS.BL15.0190.ZA** | A74X | 22,8 | 25,0 | 3,0 | 28,0 | 55,0 | 0,03 – 0,07 |
| 2,0 | **DS.BL15.0200.ZA** | A74Z | 24,0 | 26,0 | 4,0 | 28,0 | 70,0 | 0,03 – 0,07 |
| 2,1 | **DS.BL15.0210.ZA** | A741 | 25,2 | 27,0 | 4,0 | 28,0 | 70,0 | 0,03 – 0,10 |
| 2,2 | **DS.BL15.0220.ZA** | A743 | 26,4 | 29,0 | 4,0 | 28,0 | 70,0 | 0,03 – 0,10 |
| 2,3 | **DS.BL15.0230.ZA** | A745 | 27,6 | 30,0 | 4,0 | 28,0 | 70,0 | 0,03 – 0,10 |
| 2,4 | **DS.BL15.0240.ZA** | A747 | 28,8 | 31,0 | 4,0 | 28,0 | 70,0 | 0,03 – 0,10 |
| 2,5 | **DS.BL15.0250.ZA** | A749 | 30,0 | 32,0 | 4,0 | 28,0 | 70,0 | 0,03 – 0,10 |
| 2,6 | **DS.BL15.0260.ZA** | A75B | 31,2 | 34,0 | 4,0 | 28,0 | 70,0 | 0,03 – 0,10 |
| 2,7 | **DS.BL15.0270.ZA** | A75D | 32,4 | 35,0 | 4,0 | 28,0 | 70,0 | 0,03 – 0,10 |
| 2,8 | **DS.BL15.0280.ZA** | A75F | 33,6 | 36,0 | 4,0 | 28,0 | 70,0 | 0,03 – 0,10 |
| 2,9 | **DS.BL15.0290.ZA** | A75H | 34,8 | 38,0 | 4,0 | 28,0 | 70,0 | 0,03 – 0,10 |
| 3,0 | **DS.BL15.0300.ZA** | A75K | 36,0 | 39,0 | 4,0 | 28,0 | 70,0 | 0,03 – 0,10 |

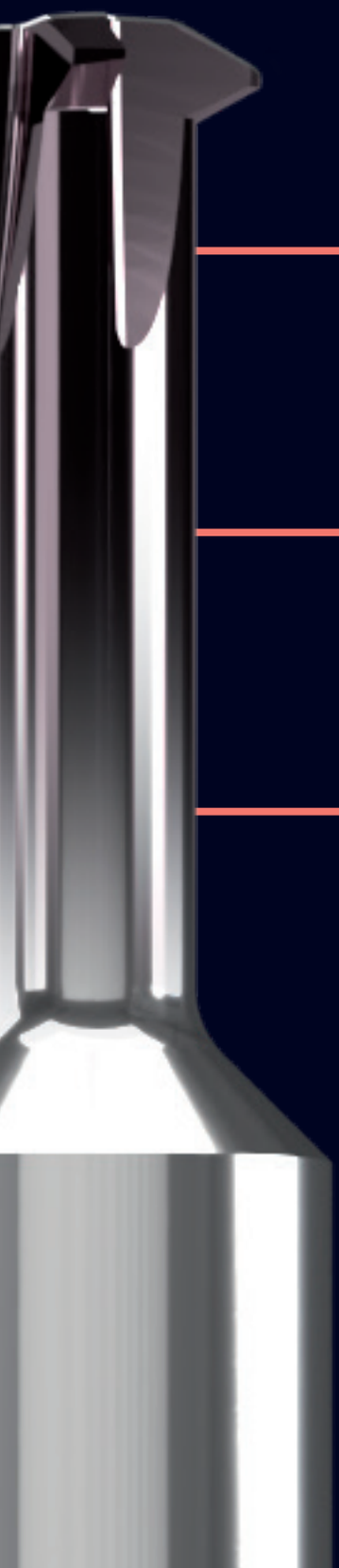
## Unsere Schneidstoff- und Schnittwertempfehlungen (Vc m/min) | Our cutting grade and cutting speed recommendations (Vc m/min)

Erklärung zu den Materialgruppen finden Sie auf Seite 69 | Explanations regarding the material groups can found on page 69

| Materialgruppen Material groups / Schneidstoff Cutting grade | P | | | | | | H | | K | | | M | | | S | | | | N | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PI | PII | PIII | PIV | PV | PVI | HI | HII | KI | KII | KIII | MI | MII | MIII | SI | SII | SIII | SIV | NI | NII | NIII | NIV | NV | NVI |
| **00 P343** | **105** | **115** | **80** | **75** | **55** | **55** | - | - | **125** | **110** | **105** | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **00 M347** | - | - | - | - | - | - | **60** | **20** | - | - | - | **30** | **40** | **30** | **20** | **20** | **20** | **25** | - | - | - | - | - | - |
| **00 N351** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **200** | **180** | **180** | **135** | **100** | - |
| **00 C372** | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **120** | **80** |

Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade
Bestellbeispiel | Order example: **DS.BL15.0150.ZA 00 P343 oder A74N 00 P343** (00 P343 = Schneidstoff | Grade)

# Milling! **Fräsen!** **Mit Kaestner-Tools.** With Kaestner-Tools.



## **Nutfräsen**
## Groove Milling
ab Seite | as of page **32**

## **Fräsen von Fasen**
## Chamfering
ab Seite | as of page **34**

## **Gewindefräsen**
## Thread Milling
ab Seite | as of page **35**

# Allgemeines Nutfräsen

Nutfräsen gerader Nutformen. Geeignet ab Bohrungsdurchmesser 6,0 mm.
Aufnahme nach DIN 6535 HA.

# General Groove Milling

General Groove Milling. For use in bores as of minimum bore diameter 6,0 mm.
Shank according to DIN 6535 HA.

Empfehlungen | Recommendations: **ab Seite | as of Page 63**

**H01.2**

Legende | Legend: **ab Seite | as of Page 62**

VHM | HA DIN 6535

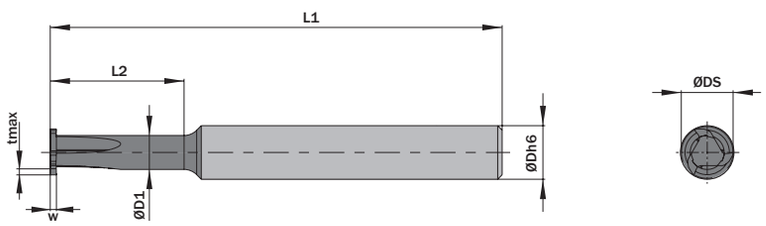



Abbildung ähnlich / Examplary image

| w ±0,02 | L2 | ØDmin (Min. Bohrung) ØDmin (min. bore) | Artikelnummer Part number | Webcode | Anzahl Schneiden Number of cutting edges | ØD1 | ØDh6 | ØDS | L1 | tmax | Vorschub fz Feed fz |
|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | mm | mm | | | | mm | mm | mm | mm | mm | mm |
| **▼ ØDmin (Min. Bohrung) \| ØDmin (min. bore) = 6,0 mm** | | | | | | | | | | | |
| 0,5 | 15,0 | 6,0 | **MS.DC14.0515.ZA** | A75N | 3 | 3,8 | 6,0 | 5,8 | 58,0 | 0,8 | 0,02 |
| 0,6 | 15,0 | 6,0 | **MS.DC14.0615.ZA** | A75Q | 3 | 3,8 | 6,0 | 5,8 | 58,0 | 0,8 | 0,02 |
| 0,7 | 15,0 | 6,0 | **MS.DC14.0715.ZA** | A75T | 3 | 3,8 | 6,0 | 5,8 | 58,0 | 0,8 | 0,02 |
| 0,8 | 15,0 | 6,0 | **MS.DC14.0815.ZA** | A75V | 3 | 3,8 | 6,0 | 5,8 | 58,0 | 0,8 | 0,02 |
| 0,9 | 15,0 | 6,0 | **MS.DC14.0915.ZA** | A75X | 3 | 3,8 | 6,0 | 5,8 | 58,0 | 0,8 | 0,02 |
| 1,0 | 15,0 | 6,0 | **MS.DC14.1015.ZA** | A75Z | 3 | 3,8 | 6,0 | 5,8 | 58,0 | 0,8 | 0,02 |
| 1,5 | 15,0 | 6,0 | **MS.DC14.1515.ZA** | A751 | 3 | 3,8 | 6,0 | 5,8 | 58,0 | 0,8 | 0,02 |
| **▼ ØDmin (Min. Bohrung) \| ØDmin (min. bore) = 8,0 mm** | | | | | | | | | | | |
| 0,7 | 25,0 | 8,0 | **MS.DC15.0725.ZA** | A753 | 3 | 5,0 | 8,0 | 7,8 | 68,0 | 1,2 | 0,02 |
| 0,8 | 25,0 | 8,0 | **MS.DC15.0825.ZA** | A755 | 3 | 5,0 | 8,0 | 7,8 | 68,0 | 1,2 | 0,02 |
| 0,9 | 25,0 | 8,0 | **MS.DC15.0925.ZA** | A757 | 3 | 5,0 | 8,0 | 7,8 | 68,0 | 1,2 | 0,02 |
| 1,0 | 25,0 | 8,0 | **MS.DC15.1025.ZA** | A759 | 3 | 5,0 | 8,0 | 7,8 | 68,0 | 1,2 | 0,02 |
| 1,5 | 25,0 | 8,0 | **MS.DC15.1525.ZA** | A76B | 3 | 5,0 | 8,0 | 7,8 | 68,0 | 1,2 | 0,02 |
| 2,0 | 25,0 | 8,0 | **MS.DC15.2025.ZA** | A76D | 3 | 5,0 | 8,0 | 7,8 | 68,0 | 1,2 | 0,02 |

**Unsere Schneidstoffempfehlung für die Bearbeitung der Materialgruppen P und K: L1 U343**
**Our cutting grade recommendation for the machininig of the material groups P and K: L1 U343**

Für weitere Informationen wenden Sie sich bitte an unsere technische Fachberatung unter **support@kaestner.com** bzw. **+49 7473 9517 150.**
For further information, please contact our technical support at **support@kaestner.com** or **+49 7473 9517 150.**

Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade
Bestellbeispiel | Order example: **MS.DC14.0515.ZA L1 U343 oder A75N L1 U343** (L1 U343 = Schneidstoff | Grade)

# Fräsen von Vollradiusnuten

Nutfräsen runder Nutformen. Geeignet ab Bohrungsdurchmesser 4,0 mm.
Aufnahme nach DIN 6535 HA.

# Full Radius Groove Milling

Full radius groove milling. For use in bores as of minimum bore diameter 4,0 mm.
Shank according to DIN 6535 HA.

Empfehlungen | Recommendations: **ab Seite | as of Page 63**

**H01.2**

Legende | Legend: **ab Seite | as of Page 62**

VHM | HA DIN 6535

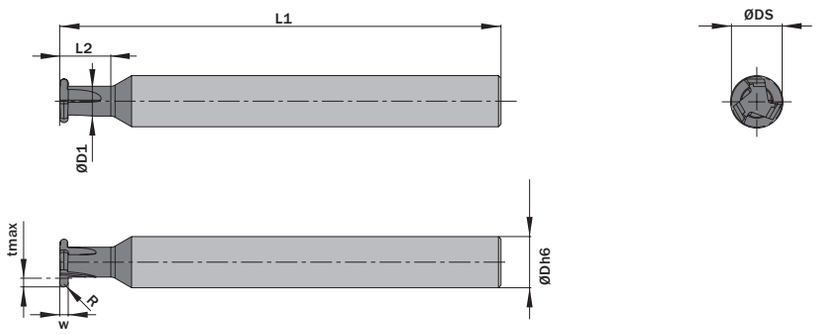



Abbildung ähnlich / Examplary image

| w ±0,02 | L2 | ØDmin (Min. Bohrung) ØDmin (min. bore) | R | Artikelnummer Part number | Webcode | Anzahl Schneiden Number of cutting edges | ØD1 | ØDh6 | ØDS | L1 | tmax | Vorschub fz Feed fz |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | mm | mm | mm | | | | mm | mm | mm | mm | mm | mm |
| **▼ ØDmin (Min. Bohrung) \| ØDmin (min. bore) = 4,0 mm** | | | | | | | | | | | | |
| 1,0 | 4,0 | 4,0 | 0,5 | **MS.DC14.1004.VA** | A76F | 3 | 2,55 | 6,0 | 3,8 | 58,0 | 0,5 | 0,02 |
| **▼ ØDmin (Min. Bohrung) \| ØDmin (min. bore) = 6,0 mm** | | | | | | | | | | | | |
| 1,0 | 6,0 | 6,0 | 0,5 | **MS.DC14.1006.VA** | A76H | 3 | 3,5 | 6,0 | 5,8 | 58,0 | 1,0 | 0,02 |
| 1,5 | 6,0 | 6,0 | 0,75 | **MS.DC14.1506.VA** | A76K | 3 | 3,5 | 6,0 | 5,8 | 58,0 | 1,0 | 0,02 |
| **▼ ØDmin (Min. Bohrung) \| ØDmin (min. bore) = 8,0 mm** | | | | | | | | | | | | |
| 2,0 | 16,0 | 8,0 | 1,0 | **MS.DC15.2016.VA** | A76N | 4 | 4,4 | 8,0 | 7,8 | 68,0 | 1,5 | 0,02 |
| **▼ ØDmin (Min. Bohrung) \| ØDmin (min. bore) = 10,0 mm** | | | | | | | | | | | | |
| 1,0 | 20,0 | 10,0 | 0,5 | **MS.DC16.1020.VA** | A76Q | 4 | 5,3 | 10,0 | 9,8 | 78,0 | 2,0 | 0,02 |
| 1,5 | 20,0 | 10,0 | 0,75 | **MS.DC16.1520.VA** | A76T | 4 | 5,3 | 10,0 | 9,8 | 78,0 | 2,0 | 0,02 |
| 2,5 | 20,0 | 10,0 | 1,25 | **MS.DC16.2520.VA** | A76V | 4 | 5,3 | 10,0 | 9,8 | 78,0 | 2,0 | 0,02 |
| 3,0 | 20,0 | 10,0 | 1,5 | **MS.DC16.3020.VA** | A76X | 4 | 5,3 | 10,0 | 9,8 | 78,0 | 2,0 | 0,02 |

**Unsere Schneidstoffempfehlung für die Bearbeitung der Materialgruppen P und K: L1 U343**
**Our cutting grade recommendation for the machininig of the material groups P and K: L1 U343**

Für weitere Informationen wenden Sie sich bitte an unsere technische Fachberatung unter **support@kaestner.com** bzw. **+49 7473 9517 150.**
For further information, please contact our technical support at **support@kaestner.com** or **+49 7473 9517 150.**

Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade
Bestellbeispiel | Order example: **MS.DC14.1004.VA L1 U343 oder A76F L1 U343** (L1 U343 = Schneidstoff | Grade)

# Fräsen von Fasen

Fasenfräsen beidseitig. Geeignet ab Bohrungsdurchmesser 6,0 mm.
Aufnahme nach DIN 6535 HA.

# Chamfering

Chamfering on both sides. For use in bores as of minimum bore diameter 6,0 mm.
Shank according to DIN 6535 HA.

Empfehlungen | Recommendations: **ab Seite | as of Page 63**

**H01.2**

Legende | Legend: **ab Seite | as of Page 62**

VHM | HA DIN 6535 | coated

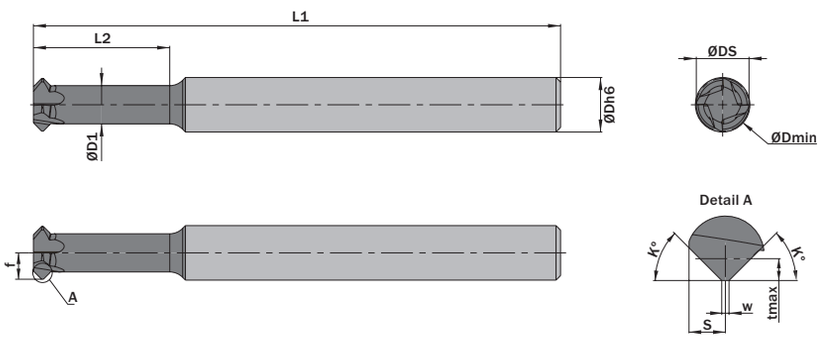



Abbildung ähnlich / Examplary image

| κ | w | L2 | ØDmin (Min. Bohrung) ØDmin (min. bore) | Artikelnummer Part number | Webcode | Anzahl Schneiden Number of cutting edges | ØD1 | ØDh6 | ØDS | L1 | S | tmax | Vorschub fz Feed fz |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mm | mm | mm | | | | mm | mm | mm | mm | mm | mm | mm |
| **▼ ØDmin (Min. Bohrung) \| ØDmin (min. bore) = 6,0 mm** | | | | | | | | | | | | | |
| 45° | 0,2 | 15,0 | 6,0 | **MS.DC14.4515.EA** | A79H | 4 | 4,2 | 6,0 | 5,8 | 58,0 | 1,0 | 0,6 | 0,02 |
| 45° | 0,2 | 25,0 | 6,0 | **MS.DC14.4525.EA** | A79K | 4 | 4,2 | 6,0 | 5,8 | 68,0 | 1,0 | 0,6 | 0,02 |
| **▼ ØDmin (Min. Bohrung) \| ØDmin (min. bore) = 8,0 mm** | | | | | | | | | | | | | |
| 45° | 0,2 | 25,0 | 8,0 | **MS.DC15.4525.EA** | A79N | 4 | 5,0 | 8,0 | 7,8 | 68,0 | 1,5 | 1,2 | 0,02 |
| 45° | 0,2 | 35,0 | 8,0 | **MS.DC15.4535.EA** | A79Q | 4 | 5,0 | 8,0 | 7,8 | 78,0 | 1,5 | 1,2 | 0,02 |

**Unsere Schneidstoffempfehlung für die Bearbeitung der Materialgruppen P und K: L1 U343**
**Our cutting grade recommendation for the machininig of the material groups P and K: L1 U343**

Für weitere Informationen wenden Sie sich bitte an unsere technische Fachberatung unter **support@kaestner.com** bzw. **+49 7473 9517 150.**
For further information, please contact our technical support at **support@kaestner.com** or **+49 7473 9517 150.**

Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade
Bestellbeispiel | Order example: **MS.DC14.4515.EA L1 U343 oder A79H L1 U343** (L1 U343 = Schneidstoff | Grade)

# Metrisches ISO-Gewindefräsen, Teilprofil

Gewindefräsen ab Bohrungsdurchmesser 1,4 mm, metrisches ISO-Gewinde, Teilprofil. Aufnahme nach DIN 6535 HA.

# Thread milling, Metric ISO-thread, Partial Profile

Thread milling as of bore diameter 1,4 mm, ISO metric thread, partial profile. Shank according to DIN 6535 HA.

Empfehlungen | Recommendations: **ab Seite | as of Page 63**

**H01.2**

Legende | Legend: **ab Seite | as of Page 62**

VHM | HA DIN 6535 | coated

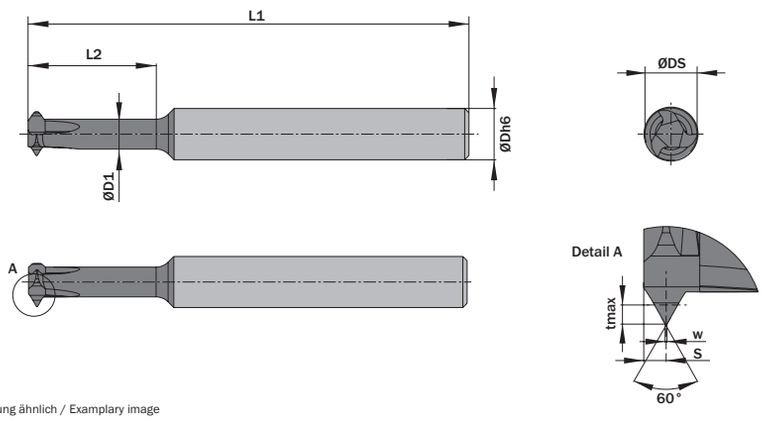



Abbildung ähnlich / Examplary image

| Ab Gewindegröße As of thread size | Steigung (von) Pitch (as of) | Steigung (bis) Pitch (up to) | L2 | ØDh6 | Artikelnummer Part number | Webcode | Anzahl Schneiden Number of cutting edges | ØD1 | ØDmin (Min. Bohrung) ØDmin (min. bore) | ØDS | L1 | tmax | w | S | Vorschub fz Feed fz |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mm | mm | mm | mm | | | | mm | | mm | mm | mm | mm | mm | mm |
| **▼ ØDh6 = 3,0 mm** | | | | | | | | | | | | | | | |
| M1 | 0,25 | 0,25 | 2,5 | 3,0 | **OS.DBM1.0202.EA** | A76Z | 3 | 0,33 | 0,75 | 0,7 | 32,0 | 0,14 | 0,03 | 0,2 | 0,02 |
| M1,6 | 0,35 | 0,35 | 4,0 | 3,0 | **OS.DBM1.0304.EA** | A761 | 3 | 0,67 | 1,38 | 1,18 | 32,0 | 0,19 | 0,04 | 0,2 | 0,02 |
| M1,8 | 0,35 | 0,35 | 5,0 | 3,0 | **OS.DBM1.0305.EA** | A763 | 3 | 0,86 | 1,58 | 1,38 | 32,0 | 0,19 | 0,04 | 0,2 | 0,02 |
| M2,5 | 0,4 | 0,4 | 5,0 | 3,0 | **OS.DBM1.0405.EA** | A765 | 4 | 0,92 | 2,07 | 1,5 | 32,0 | 0,22 | 0,05 | 0,3 | 0,02 |
| M3 | 0,45 | 0,45 | 6,0 | 3,0 | **OS.DBM1.0406.EA** | A767 | 4 | 1,28 | 2,52 | 1,95 | 32,0 | 0,25 | 0,06 | 0,3 | 0,02 |
| M3,5 | 0,5 | 0,5 | 7,0 | 3,0 | **OS.DBM1.0507.EA** | A769 | 4 | 1,67 | 2,96 | 2,4 | 32,0 | 0,27 | 0,06 | 0,3 | 0,02 |
| M4,0 | 0,6 | 0,6 | 8,0 | 3,0 | **OS.DBM1.0608.EA** | A77B | 4 | 1,93 | 3,35 | 2,8 | 32,0 | 0,33 | 0,08 | 0,4 | 0,02 |
| **▼ ØDh6 = 5,0 mm** | | | | | | | | | | | | | | | |
| M4,5 | 0,7 | 0,7 | 9,0 | 5,0 | **OS.DBM3.0709.EA** | A77D | 4 | 2,12 | 3,74 | 3,1 | 44,0 | 0,38 | 0,09 | 0,4 | 0,02 |
| M5,5 | 0,8 | 0,8 | 10,0 | 5,0 | **OS.DBM3.0810.EA** | A77F | 4 | 2,97 | 4,63 | 4,1 | 44,0 | 0,43 | 0,1 | 0,5 | 0,02 |
| M7,0 | 1,0 | 1,0 | 12,0 | 5,0 | **OS.DBM3.1012.EA** | A77H | 4 | 3,51 | 5,92 | 4,9 | 44,0 | 0,54 | 0,13 | 0,6 | 0,02 |
| M7,0 | 1,0 | 1,0 | 15,0 | 5,0 | **OS.DBM3.1015.EA** | A77K | 4 | 3,5 | 5,92 | 4,9 | 44,0 | 0,54 | 0,13 | 0,6 | 0,02 |
| **▼ ØDh6 = 6,0 mm** | | | | | | | | | | | | | | | |
| M7,0 | 0,5 | 1,5 | 15,0 | 6,0 | **OS.DBM4.1515.EA** | A77N | 4 | 3,5 | 6,0 | 5,8 | 58,0 | 0,92 | 0,06 | 0,8 | 0,02 |
| **▼ ØDh6 = 8,0 mm** | | | | | | | | | | | | | | | |
| M9,0 | 0,5 | 1,5 | 25,0 | 8,0 | **OS.DBM5.1525.EA** | A77Q | 4 | 5,5 | 8,0 | 7,8 | 68,0 | 0,91 | 0,06 | 1,0 | 0,02 |
| M10,0 | 1,0 | 2,0 | 25,0 | 8,0 | **OS.DBM5.2025.EA** | A77T | 4 | 5,0 | 8,0 | 7,8 | 68,0 | 1,19 | 0,12 | 1,0 | 0,02 |

**Unsere Schneidstoffempfehlung für die Bearbeitung der Materialgruppen P und K: L1 U343**
**Our cutting grade recommendation for the machininig of the material groups P and K: L1 U343**

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Bestellbeispiel | Order example: **OS.DBM1.0202.EA L1 U343 oder A76Z L1 U343** (L1 U343 = Schneidstoff | Grade)

# Metrisches ISO-Regelgewinde, Teilprofil

Gewindefräsen ab Bohrungsdurchmesser 1,5 mm, metrisches ISO-Regelgewinde, Teilprofil. Aufnahme nach DIN 6535 HA.

# Metric ISO-Coarse thread, Partial profile

Thread milling as of bore diameter 1,5 mm, metric ISO coarse thread, partial profile. Shank according to DIN 6535 HA.

Empfehlungen | Recommendations: **ab Seite | as of Page 63**

**H01.2**

Legende | Legend: **ab Seite | as of Page 62**

VHM | HA DIN 6535 | coated

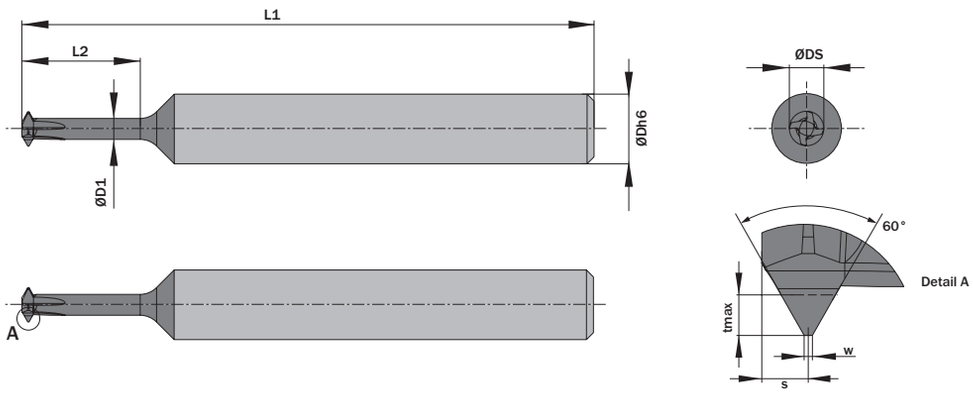



Abbildung ähnlich / Examplary image

| Ab Gewindegröße<br>As of thread size | Steigung (von)<br>Pitch (as of) | Steigung (bis)<br>Pitch (up to) | L2 | ØDh6 | Artikelnummer<br>Part number | Webcode | Anzahl Schneiden<br>Number of cutting edges | ØD1 | ØDmin (Min. Bohrung)<br>ØDmin (min. bore) | ØDS | L1 | tmax | w | S | Vorschub fz<br>Feed fz |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mm | mm | mm | mm | | | | mm | mm | mm | mm | mm | mm | mm | mm |
| **▼ ØDh6 = 3,0 mm** | | | | | | | | | | | | | | | |
| M2 | 0,4 | 0,45 | 5,1 | 3,0 | **OS.DBR1.0450.EA** | A77V | 4 | 0,77 | 1,5 | 1,45 | 32,0 | 0,27 | 0,05 | 0,3 | 0,02 |
| M2,5 | 0,45 | 0,5 | 6,1 | 3,0 | **OS.DBR1.0500.EA** | A77X | 4 | 1,06 | 1,9 | 1,8 | 32,0 | 0,29 | 0,05 | 0,3 | 0,02 |
| M3 | 0,5 | 0,6 | 7,1 | 3,0 | **OS.DBR1.0607.EA** | A77Z | 4 | 1,27 | 2,3 | 2,15 | 32,0 | 0,35 | 0,06 | 0,3 | 0,02 |
| M3,5 | 0,6 | 0,7 | 8,1 | 3,0 | **OS.DBR1.0708.EA** | A771 | 4 | 1,39 | 2,7 | 2,4 | 32,0 | 0,41 | 0,07 | 0,4 | 0,02 |
| **▼ ØDh6 = 5,0 mm** | | | | | | | | | | | | | | | |
| M4 | 0,7 | 0,8 | 9,1 | 5,0 | **OS.DBR3.0809.EA** | A773 | 4 | 1,58 | 3,1 | 2,7 | 44,0 | 0,46 | 0,08 | 0,4 | 0,02 |
| M5 | 0,8 | 1,0 | 10,1 | 5,0 | **OS.DBR3.1010.EA** | A775 | 4 | 2,14 | 3,9 | 3,57 | 44,0 | 0,59 | 0,1 | 0,5 | 0,02 |
| M6 | 1,0 | 1,25 | 12,2 | 5,0 | **OS.DBR3.1212.EA** | A777 | 4 | 2,44 | 4,6 | 4,2 | 44,0 | 0,74 | 0,12 | 0,6 | 0,02 |
| M7 | 1,0 | 1,25 | 15,2 | 5,0 | **OS.DBR3.1215.EA** | A779 | 4 | 3,09 | 5,6 | 4,9 | 44,0 | 0,74 | 0,12 | 0,6 | 0,02 |

**Unsere Schneidstoffempfehlung für die Bearbeitung der Materialgruppen P und K: L1 U343**
**Our cutting grade recommendation for the machininig of the material groups P and K: L1 U343**

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Bestellbeispiel | Order example: **OS.DBR1.0450.EA L1 U343 oder A77V L1 U343** (L1 U343 = Schneidstoff | Grade)

# Gewindefräsen, UNC/UNF Vollprofil

Zur Herstellung des kompletten Gewindeprofils mit erforderlicher Tiefe.
Aufnahme nach DIN 6535 HA.

# Thread milling, UNC/UNF Full profile

For a complete thread profile with correct depth.
Shank according to DIN 6535 HA.

Empfehlungen | Recommendations: **ab Seite | as of Page 63**

**H01.2**

Legende | Legend: **ab Seite | as of Page 62**

VHM | HA DIN 6535 | coated

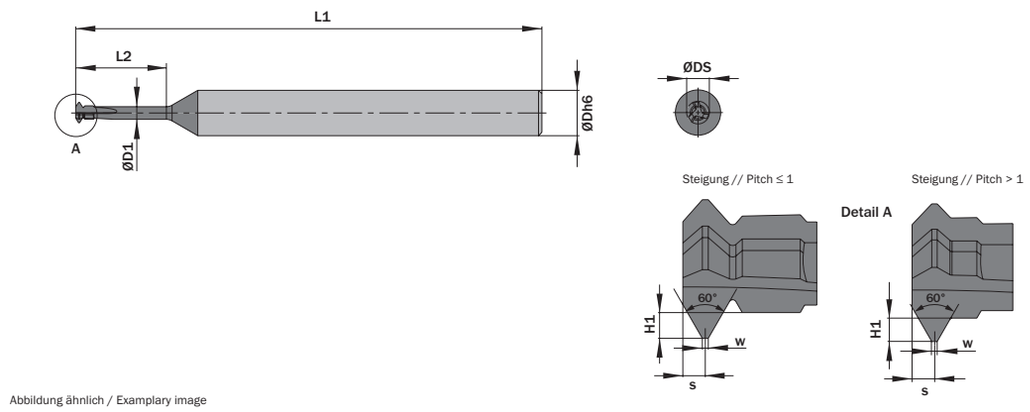



Abbildung ähnlich / Examplary image

| Gang/Zoll Threads/Inch | L2 | ØDh6 | Artikelnummer Part number | Webcode | Anzahl Schneiden Number of cutting edges | Regelgewinde Standard pitch thread | ØD1 | ØDmin (Min. Bohrung) ØDmin (min. bore) | ØDS | H1 | L1 | Steigung (von) Pitch (as of) | S | w | Vorschub fz Feed fz |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mm | mm | | | | | mm | mm | mm | mm | mm | mm | mm | mm | mm |
| **▼ ØDh6 = 4,0 mm** | | | | | | | | | | | | | | | |
| 32 | 8,0 | 4,0 | **OS.DAN2.3208.EA** | A78B | 3 | Ja / Yes | 1,14 | 2,6 | 2,2 | 0,43 | 44,0 | 0,794 | 0,4 | 0,1 | 0,02 |
| 40 | 8,0 | 4,0 | **OS.DAN2.4008.EA** | A78D | 3 | Ja / Yes | 1,11 | 2,4 | 2,0 | 0,344 | 44,0 | 0,635 | 0,3 | 0,08 | 0,02 |
| **▼ ØDh6 = 6,0 mm** | | | | | | | | | | | | | | | |
| 24 | 10,0 | 6,0 | **OS.DAN4.2410.EA** | A78F | 3 | Ja / Yes | 1,55 | 3,6 | 2,9 | 0,573 | 58,0 | 1,058 | 0,4 | 0,13 | 0,02 |
| 28 | 10,0 | 6,0 | **OS.DAC4.2810.EA** | A78H | 4 | Nein / No | 2,32 | 5,3 | 3,5 | 0,491 | 68,0 | 0,907 | 0,4 | 0,11 | 0,02 |

**Unsere Schneidstoffempfehlung für die Bearbeitung der Materialgruppen P und K: L1 U343**
**Our cutting grade recommendation for the machininig of the material groups P and K: L1 U343**

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Bestellbeispiel | Order example: **OS.DAN2.3208.EA L1 U343 oder A78B L1 U343** (L1 U343 = Schneidstoff | Grade)

# Metrisches ISO-Gewindefräsen, Vollprofil

Gewindefräsen ab Bohrungsdurchmesser 2,4 mm, metrisches ISO-Gewinde, Vollprofil. Aufnahme nach DIN 6535 HA.

# Thread milling, metric ISO-Thread, Full profile

Thread milling as of bore diameter 2,4 mm, ISO metric thread, full profile. Shank according to DIN 6535 HA.

Empfehlungen | Recommendations: **ab Seite | as of Page 63**

**H01.2**

Legende | Legend: **ab Seite | as of Page 62**

VHM | HA DIN 6535 | coated

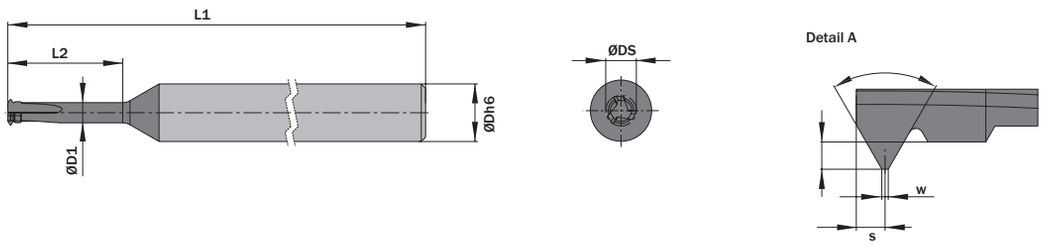



Abbildung ähnlich / Examplary image

| Ab Gewindegröße<br>As of thread size | Ab Gewindenenndurchmesser \| As of nominal thread diameter | L2 | ØDh6 | Artikelnummer<br>Part number | Webcode | Anzahl Schneiden<br>Number of cutting edges | Regelgewinde<br>Standard pitch thread | ØD1 | ØDmin (Min. Bohrung)<br>ØDmin (min. bore) | ØDS | H1 | L1 | Steigung (von)<br>Pitch (as of) | S | w | Vorschub fz<br>Feed fz |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mm | mm | mm | | | | | mm | mm | mm | mm | mm | mm | mm | mm | mm |
| **▼ ØDh6 = 4,0 mm** | | | | | | | | | | | | | | | | |
| M2,5 | 2,26 | 8,0 | 4,0 | **OS.DAM2.0304.EA** | A78K | 3 | Nein / No | 1,4 | 2,4 | 2,0 | 0,19 | 44,0 | 0,35 | 0,2 | 0,04 | 0,02 |
| M2,5 | 2,47 | 8,0 | 4,0 | **OS.DAR2.0508.EA** | A78N | 3 | Ja / Yes | 1,25 | 2,4 | 2,0 | 0,27 | 44,0 | 0,5 | 0,3 | 0,06 | 0,02 |
| **▼ ØDh6 = 6,0 mm** | | | | | | | | | | | | | | | | |
| M3,5 | 3,29 | 10,0 | 6,0 | **OS.DAM4.0506.EA** | A78Q | 3 | Nein / No | 2,0 | 3,3 | 2,8 | 0,27 | 58,0 | 0,5 | 0,3 | 0,06 | 0,02 |
| M4 | 3,65 | 10,0 | 6,0 | **OS.DAR4.0710.EA** | A78T | 3 | Ja / Yes | 1,85 | 3,3 | 2,8 | 0,38 | 58,0 | 0,7 | 0,4 | 0,09 | 0,02 |
| M6 | 5,21 | 16,0 | 6,0 | **OS.DAM4.0716.EA** | A78V | 4 | Nein / No | 3,1 | 5,0 | 4,2 | 0,41 | 68,0 | 0,75 | 0,5 | 0,09 | 0,02 |
| M5 | 4,67 | 12,0 | 6,0 | **OS.DAR4.0812.EA** | A78X | 4 | Ja / Yes | 2,4 | 4,1 | 3,6 | 0,43 | 58,0 | 0,8 | 0,6 | 0,09 | 0,02 |
| M6 | 5,81 | 16,0 | 6,0 | **OS.DAR4.1016.EA** | A78Z | 4 | Ja / Yes | 2,8 | 5,0 | 4,2 | 0,54 | 68,0 | 1,0 | 0,6 | 0,12 | 0,02 |
| M8 | 7,91 | 16,0 | 6,0 | **OS.DAR4.1216.EA** | A781 | 4 | Ja / Yes | 3,7 | 6,5 | 5,5 | 0,68 | 68,0 | 1,25 | 0,8 | 0,16 | 0,02 |
| **▼ ØDh6 = 8,0 mm** | | | | | | | | | | | | | | | | |
| M10 | 8,59 | 25,0 | 8,0 | **OS.DAM5.0125.EA** | A783 | 4 | Nein / No | 5,4 | 8,0 | 6,8 | 0,54 | 78,0 | 1,0 | 0,6 | 0,12 | 0,02 |
| M12 | 10,13 | 20,0 | 8,0 | **OS.DAR5.1520.EA** | A785 | 4 | Ja / Yes | 4,7 | 8,0 | 6,8 | 0,81 | 68,0 | 1,5 | 0,9 | 0,19 | 0,02 |
| **▼ ØDh6 = 10,0 mm** | | | | | | | | | | | | | | | | |
| M12 | 10,61 | 30,0 | 10,0 | **OS.DAM6.1230.EA** | A787 | 4 | Nein / No | 6,1 | 10,0 | 8,0 | 0,68 | 78,0 | 1,25 | 0,8 | 0,16 | 0,02 |
| M14 | 12,37 | 30,0 | 10,0 | **OS.DAR6.1730.EA** | A789 | 4 | Ja / Yes | 5,5 | 10,0 | 8,0 | 0,95 | 78,0 | 1,75 | 1,0 | 0,22 | 0,02 |

**Unsere Schneidstoffempfehlung für die Bearbeitung der Materialgruppen P und K: L1 U343**
**Our cutting grade recommendation for the machininig of the material groups P and K: L1 U343**

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Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade
Bestellbeispiel | Order example: **OS.DAM2.0304.EA L1 U343 oder A78K L1 U343** (L1 U343 = Schneidstoff | Grade)

# Gewindefräsen, Whitworth Rohrgewinde BSP

Zur Herstellung des vollständigen Gewindeprofils mit erforderlicher Tiefe sowie Kopf- und Fußradien. Aufnahme nach DIN 6535 HA.

# Thread milling, Whitworth Pipe Thread BSP

For a complete thread profile with correct depth, top radius and bottom radius. Shank according to DIN 6535 HA.

Empfehlungen | Recommendations: **ab Seite | as of Page 63**

**H01.2**

Legende | Legend: **ab Seite | as of Page 62**

VHM | HA DIN 6535 | coated

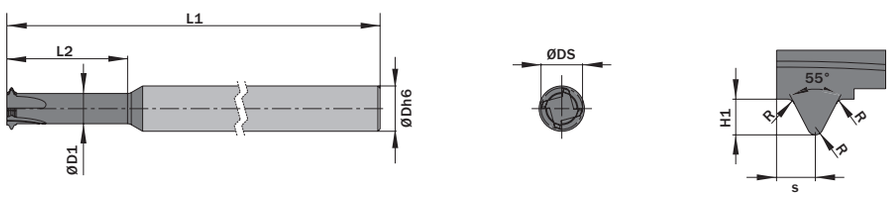



Abbildung ähnlich / Examplary image

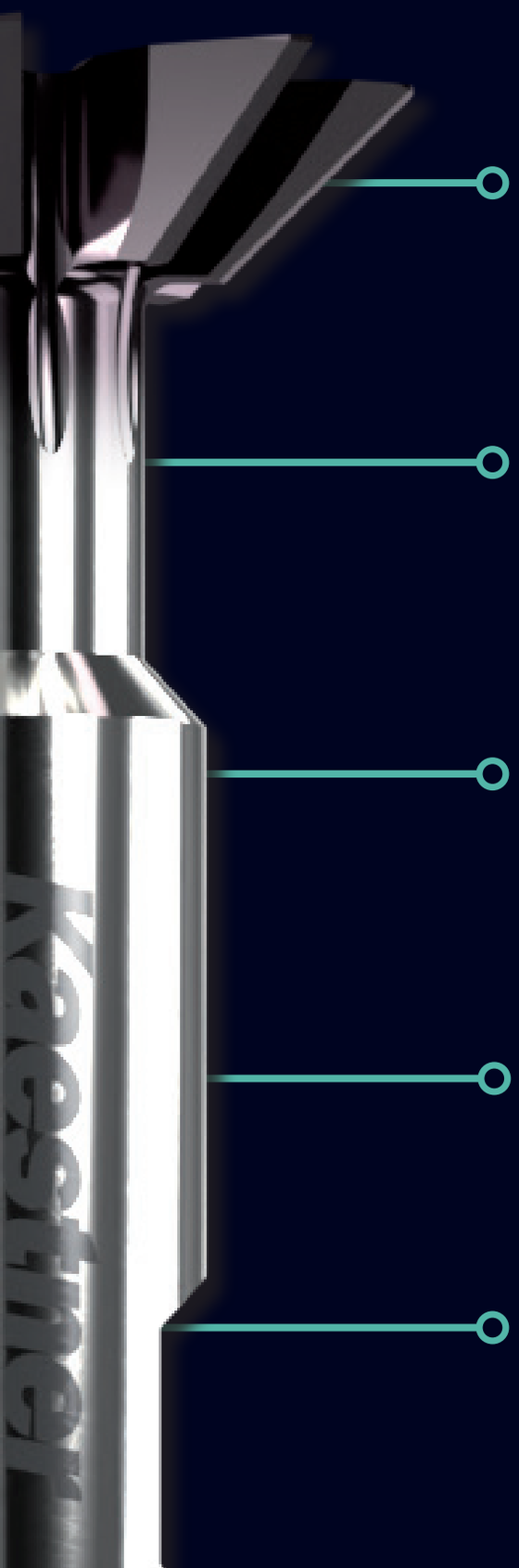
| Gewinde Thread | Gang/Zoll Threads/inch | L2 | ØDh6 | Artikelnummer Part number | Webcode | Anzahl Schneiden Number of cutting edges | ØD1 | ØDmin (Min. Bohrung) ØDmin (min. bore) | ØDS | H1 | L1 | Steigung (von) Pitch (as of) | R | S | Vorschub fz Feed fz |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | mm | mm | | | | mm | mm | mm | mm | mm | mm | mm | mm | mm |
| **▼ ØDh6 = 6,0 mm** | | | | | | | | | | | | | | | |
| G 1/16“ | 28 | 16,0 | 6,0 | **OS.DAW4.2816.EA** | A79B | 4 | 4,0 | 6,5 | 5,5 | 0,58 | 68,0 | 0,91 | 0,13 | 0,6 | 0,02 |
| **▼ ØDh6 = 8,0 mm** | | | | | | | | | | | | | | | |
| G 1/8“ | 28 | 16,0 | 8,0 | **OS.DAW5.2816.EA** | A79D | 4 | 5,0 | 8,5 | 6,6 | 0,58 | 68,0 | 0,91 | 0,13 | 0,6 | 0,02 |
| **▼ ØDh6 = 10,0 mm** | | | | | | | | | | | | | | | |
| G 1/4“ | 19 | 20,0 | 10,0 | **OS.DAW6.1920.EA** | A79F | 4 | 7,0 | 11,4 | 9,5 | 0,86 | 68,0 | 1,34 | 0,18 | 0,9 | 0,02 |

**Unsere Schneidstoffempfehlung für die Bearbeitung der Materialgruppen P und K: L1 U343**
**Our cutting grade recommendation for the machininig of the material groups P and K: L1 U343**

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Bestellbeispiel | Order example: **OS.DAW4.2816.EA L1 U343 oder A79B L1 U343** (L1 U343 = Schneidstoff | Grade)

# Milling! Fräsen! Mit Kaestner-Tools.
With Kaestner-Tools.



## T-Nutenfräsen
T-Slot-Milling

ab Seite | as of page **41**

## Fräsen von Scheibenfedernuten und Schlitzen
Keyway and Slot Milling

ab Seite | as of page **45**

## Winkelfräsen
Dovetail Milling

Form A und Form C ab Seite | Form A and Form C as of page **48**
Form B und Form D ab Seite | Form B and Form D as of page **52**

## HPC Fräsen
HPC Milling

ab Seite | as of page **56**

## Scheibenfräser
Disc Milling Cutters

ab Seite | as of page **58**

# Fräsen von T-Nuten

T-Nutenfräser nach DIN 851 aus VHM zum Herstellen von T-Nuten angelehnt an DIN 650, jedoch mit Eckfasen. Schlichtprofil (Typ N). Aufnahme nach DIN 6535 HA. Kreuzverzahnt.

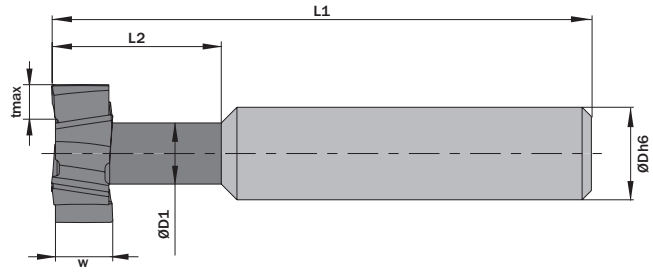
# T-slot milling

Solid carbide T-slot milling tools according to DIN 851 for the milling of T-slots following DIN 650, but with corner chamfers. Finishing profile (Type N). Cylindrical shank according to DIN 6535 HA. Staggered teeth.

Empfehlungen | Recommendations: **ab Seite | as of Page 61**

**E01 · E02 · H01.2**

Legende | Legend: **ab Seite | as of Page 60**



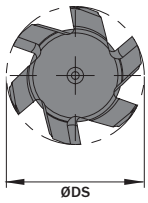




Abbildung ähnlich / Examplary image

| w d11 | L1 | ØDS d11 | ØDh6 | Artikelnummer Part number | Webcode | ØD1 | L2 | tmax | Anzahl Schneiden Number of cutting edges | Vorschub fz Feed fz |
|---|---|---|---|---|---|---|---|---|---|---|
| mm | mm | mm | mm | | | mm | mm | mm | | mm |
| 6,0 | 57,0 | 12,5 | 10,0 | **MS.DI1S.060.13.EA** | A467 | 5,0 | 14,0 | 3,5 | 6 | 0,033 – 0,045 |
| 8,0 | 62,0 | 16,0 | 10,0 | **MS.DI1S.080.16.EA** | A469 | 7,0 | 20,0 | 4,0 | 6 | 0,033 – 0,045 |
| 8,0 | 70,0 | 18,0 | 12,0 | **MS.DI1S.080.18.EA** | A47B | 8,0 | 22,0 | 4,5 | 6 | 0,033 – 0,045 |
| 9,0 | 74,0 | 21,0 | 12,0 | **MS.DI1S.090.21.EA** | A47D | 10,0 | 27,0 | 5,0 | 6 | 0,033 – 0,045 |
| 11,0 | 82,0 | 25,0 | 16,0 | **MS.DI1S.110.25.EA** | A47F | 12,0 | 29,5 | 6,0 | 6 | 0,033 – 0,045 |
| 12,0 | 85,0 | 28,0 | 16,0 | **MS.DI1S.120.28.EA** | A47H | 13,0 | 33,5 | 7,0 | 6 | 0,033 – 0,045 |
| 14,0 | 90,0 | 32,0 | 16,0 | **MS.DI1S.140.32.EA** | A47K | 15,0 | 38,0 | 8,0 | 6 | 0,033 – 0,045 |

**Unsere Schneidstoff- und Schnittwertempfehlungen (Vc m/min) | Our cutting grade and cutting speed recommendations (Vc m/min)**

Erklärung zu den Materialgruppen finden Sie auf Seite 67 | Explanations regarding the material groups can found on page 67

| Materialgruppen Material groups / Schneidstoff Cutting grade | P | | | | | | H | | K | | | M | | | S | | | | N | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PI | PII | PIII | PIV | PV | PVI | HI | HII | KI | KII | KIII | MI | MII | MIII | SI | SII | SIII | SIV | NI | NII | NIII | NIV | NV | NVI |
| **P1 U333** | **110** | **90** | **85** | 80 | 60 | - | - | - | **100** | **90** | **85** | - | - | - | - | - | - | - | - | - | - | - | - | - |

Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade

Bestellbeispiel | Order example: **MS.DI1S.060.13.EA P1 U333 oder A467 P1 U333** (P1 U333 = Schneidstoff | Grade)

# Fräsen von T-Nuten

T-Nutenfräser nach DIN 851 aus VHM zum Herstellen von T-Nuten angelehnt an DIN 650, jedoch mit Eckfasen. Schlichtprofil (Typ N). Aufnahme nach DIN 6535 HB. Kreuzverzahnt.

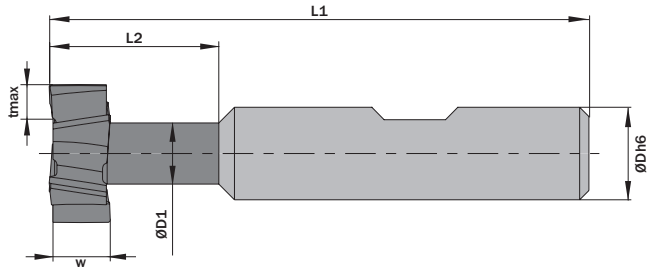
# T-slot milling

Solid carbide T-slot milling tools according to DIN 851 for the milling of T-slots following DIN 650, but with corner chamfers. Finishing profile (Type N). Cylindrical shank according to DIN 6535 HB. Staggered teeth.

Empfehlungen | Recommendations: **ab Seite | as of Page 61**

**E01 · E02 · H01.2**

Legende | Legend: **ab Seite | as of Page 60**



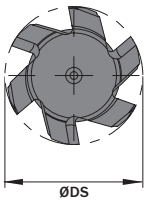




Abbildung ähnlich / Examplary image

| w d11 | L1 | ØDS d11 | ØDh6 | Artikelnummer Part number | Webcode | ØD1 | L2 | tmax | Anzahl Schneiden Number of cutting edges | Vorschub fz Feed fz |
|---|---|---|---|---|---|---|---|---|---|---|
| mm | mm | mm | mm | | | mm | mm | mm | | mm |
| 6,0 | 57,0 | 12,5 | 10,0 | **MS.DI1S.060.13.EB** | A6NV | 5,0 | 14,0 | 3,5 | 6 | 0,033 – 0,045 |
| 8,0 | 62,0 | 16,0 | 10,0 | **MS.DI1S.080.16.EB** | A6NX | 7,0 | 20,0 | 4,0 | 6 | 0,033 – 0,045 |
| 8,0 | 70,0 | 18,0 | 12,0 | **MS.DI1S.080.18.EB** | A6NZ | 8,0 | 22,0 | 4,5 | 6 | 0,033 – 0,045 |
| 9,0 | 74,0 | 21,0 | 12,0 | **MS.DI1S.090.21.EB** | A6N1 | 10,0 | 27,0 | 5,0 | 6 | 0,033 – 0,045 |
| 11,0 | 82,0 | 25,0 | 16,0 | **MS.DI1S.110.25.EB** | A6N3 | 12,0 | 29,5 | 6,0 | 6 | 0,033 – 0,045 |
| 12,0 | 85,0 | 28,0 | 16,0 | **MS.DI1S.120.28.EB** | A6N5 | 13,0 | 33,5 | 7,0 | 6 | 0,033 – 0,045 |
| 14,0 | 90,0 | 32,0 | 16,0 | **MS.DI1S.140.32.EB** | A6N7 | 15,0 | 38,0 | 8,0 | 6 | 0,033 – 0,045 |

**Unsere Schneidstoff- und Schnittwertempfehlungen (Vc m/min) | Our cutting grade and cutting speed recommendations (Vc m/min)**

Erklärung zu den Materialgruppen finden Sie auf Seite 67 | Explanations regarding the material groups can found on page 67

| Materialgruppen Material groups / Schneidstoff Cutting grade | P | | | | | | H | | K | | | M | | | S | | | | N | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PI | PII | PIII | PIV | PV | PVI | HI | HII | KI | KII | KIII | MI | MII | MIII | SI | SII | SIII | SIV | NI | NII | NIII | NIV | NV | NVI |
| **P1 U333** | **110** | **90** | **85** | 80 | 60 | - | - | - | **100** | **90** | **85** | - | - | - | - | - | - | - | - | - | - | - | - | - |

Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade
Bestellbeispiel | Order example: **MS.DI1S.060.13.EB P1 U333 oder A6NV P1 U333** (P1 U333 = Schneidstoff | Grade)

# Fräsen von T-Nuten

T-Nutenfräser nach DIN 851 aus VHM zum Herstellen von T-Nuten angelehnt an DIN 650, jedoch mit Eckfasen. Schruppprofil (Typ NF). Aufnahme nach DIN 6535 HA. Kreuzverzahnt.

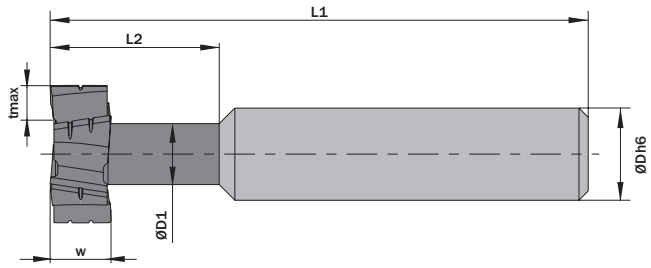
# T-slot milling

Solid carbide T-slot milling tools according to DIN 851 for the milling of T-slots following DIN 650, but with corner chamfers. Roughing profile (Type NF). Shank according to DIN 6535 HA. Staggered teeth.

Empfehlungen | Recommendations: **ab Seite | as of Page 61**

**E01 · E02 · H01.2**

Legende | Legend: **ab Seite | as of Page 60**



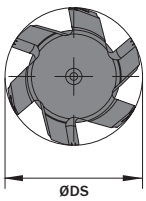




Abbildung ähnlich / Examplary image

| w d11 | L1 | ØDS d11 | ØDh6 | Artikelnummer Part number | Webcode | ØD1 | L2 | tmax | Anzahl Schneiden Number of cutting edges | Vorschub fz Feed fz |
|---|---|---|---|---|---|---|---|---|---|---|
| mm | mm | mm | mm | | | mm | mm | mm | | mm |
| 6,0 | 57,0 | 12,5 | 10,0 | **MS.DI3S.060.13.EA** | A47N | 5,0 | 14,0 | 3,5 | 6 | 0,033 – 0,045 |
| 8,0 | 62,0 | 16,0 | 10,0 | **MS.DI3S.080.16.EA** | A47Q | 7,0 | 20,0 | 4,0 | 6 | 0,033 – 0,045 |
| 8,0 | 70,0 | 18,0 | 12,0 | **MS.DI3S.080.18.EA** | A47T | 8,0 | 22,0 | 4,5 | 6 | 0,033 – 0,045 |
| 9,0 | 74,0 | 21,0 | 12,0 | **MS.DI3S.090.21.EA** | A47V | 10,0 | 27,0 | 5,0 | 6 | 0,033 – 0,045 |
| 11,0 | 82,0 | 25,0 | 16,0 | **MS.DI3S.110.25.EA** | A47X | 12,0 | 29,5 | 6,0 | 6 | 0,033 – 0,045 |
| 12,0 | 85,0 | 28,0 | 16,0 | **MS.DI3S.120.28.EA** | A47Z | 13,0 | 33,5 | 7,0 | 6 | 0,033 – 0,045 |
| 14,0 | 90,0 | 32,0 | 16,0 | **MS.DI3S.140.32.EA** | A471 | 15,0 | 38,0 | 8,0 | 6 | 0,033 – 0,045 |

## Unsere Schneidstoff- und Schnittwertempfehlungen (Vc m/min) | Our cutting grade and cutting speed recommendations (Vc m/min)

Erklärung zu den Materialgruppen finden Sie auf Seite 67 | Explanations regarding the material groups can found on page 67

| Materialgruppen Material groups / Schneidstoff Cutting grade | P | | | | | | H | | K | | | M | | | S | | | | N | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PI | PII | PIII | PIV | PV | PVI | HI | HII | KI | KII | KIII | MI | MII | MIII | SI | SII | SIII | SIV | NI | NII | NIII | NIV | NV | NVI |
| **P1 U333** | **110** | **90** | **85** | 80 | 60 | - | - | - | **100** | **90** | **85** | - | - | - | - | - | - | - | - | - | - | - | - | - |

Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade
Bestellbeispiel | Order example: **MS.DI3S.060.13.EA P1 U333 oder A47N P1 U333** (P1 U333 = Schneidstoff | Grade)

# Fräsen von T-Nuten

T-Nutenfräser nach DIN 851 aus VHM zum Herstellen von T-Nuten angelehnt an DIN 650, jedoch mit Eckfasen. Schruppprofil (Typ NF). Aufnahme nach DIN 6535 HB. Kreuzverzahnt.

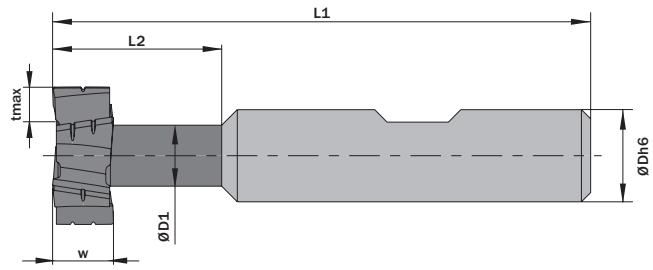
# T-slot milling

Solid carbide T-slot milling tools according to DIN 851 for the milling of T-slots following DIN 650, but with corner chamfers. Roughing profile (Type NF). Shank according to DIN 6535 HB. Staggered teeth.

Empfehlungen | Recommendations: **ab Seite | as of Page 61**

**E01 · E02 · H01.2**

Legende | Legend: **ab Seite | as of Page 60**



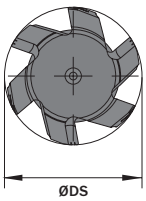




Abbildung ähnlich / Examplary image

| w d11 | L1 | ØDS d11 | ØDh6 | Artikelnummer Part number | Webcode | ØD1 | L2 | tmax | Anzahl Schneiden Number of cutting edges | Vorschub fz Feed fz |
|---|---|---|---|---|---|---|---|---|---|---|
| mm | mm | mm | mm | | | mm | mm | mm | | mm |
| 6,0 | 57,0 | 12,5 | 10,0 | **MS.DI3S.060.13.EB** | A6N9 | 5,0 | 14,0 | 3,5 | 6 | 0,033 – 0,045 |
| 8,0 | 62,0 | 16,0 | 10,0 | **MS.DI3S.080.16.EB** | A6PB | 7,0 | 20,0 | 4,0 | 6 | 0,033 – 0,045 |
| 8,0 | 70,0 | 18,0 | 12,0 | **MS.DI3S.080.18.EB** | A6PD | 8,0 | 22,0 | 4,5 | 6 | 0,033 – 0,045 |
| 9,0 | 74,0 | 21,0 | 12,0 | **MS.DI3S.090.21.EB** | A6PF | 10,0 | 27,0 | 5,0 | 6 | 0,033 – 0,045 |
| 11,0 | 82,0 | 25,0 | 16,0 | **MS.DI3S.110.25.EB** | A6PH | 12,0 | 29,5 | 6,0 | 6 | 0,033 – 0,045 |
| 12,0 | 85,0 | 28,0 | 16,0 | **MS.DI3S.120.28.EB** | A6PK | 13,0 | 33,5 | 7,0 | 6 | 0,033 – 0,045 |
| 14,0 | 90,0 | 32,0 | 16,0 | **MS.DI3S.140.32.EB** | A6PN | 15,0 | 38,0 | 8,0 | 6 | 0,033 – 0,045 |

**Unsere Schneidstoff- und Schnittwertempfehlungen (Vc m/min) | Our cutting grade and cutting speed recommendations (Vc m/min)**

Erklärung zu den Materialgruppen finden Sie auf Seite 67 | Explanations regarding the material groups can found on page 67

| Materialgruppen Material groups / Schneidstoff Cutting grade | P | | | | | | H | | K | | | M | | | S | | | | N | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PI | PII | PIII | PIV | PV | PVI | HI | HII | KI | KII | KIII | MI | MII | MIII | SI | SII | SIII | SIV | NI | NII | NIII | NIV | NV | NVI |
| **P1 U333** | **110** | **90** | **85** | 80 | 60 | - | - | - | **100** | **90** | **85** | - | - | - | - | - | - | - | - | - | - | - | - | - |

Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade

Bestellbeispiel | Order example: **MS.DI3S.060.13.EB P1 U333 oder A6N9 P1 U333** (P1 U333 = Schneidstoff | Grade)

# Fräsen von Scheibenfedernuten

Fräsen von Scheibenfedernuten (DIN6888).
Aufnahme nach DIN 6535 HA und DIN 1835 A.

# Keyway milling

Keyway milling according to DIN6888.
Shank according to DIN 6535 HA and DIN 1835 A.

Empfehlungen | Recommendations: **ab Seite | as of Page 63**

**H01.2**

Legende | Legend: **ab Seite | as of Page 62**

VHM | HA DIN 6535 | DIN 1835A | coated

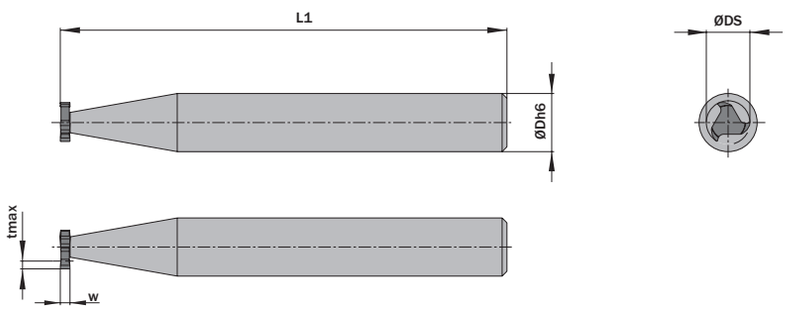



Abbildung ähnlich / Examplary image

| w e8 | ØDS | ØDh6 | Artikelnummer Part number | Webcode | Anzahl Schneiden Number of cutting edges | L1 | tmax | Aufnahme nach Shank according to | Vorschub fz Feed fz |
|---|---|---|---|---|---|---|---|---|---|
| mm | mm | mm | | | | mm | mm | | mm |
| **▼ ØDS = 4,5 mm** | | | | | | | | | |
| 1,0 | 4,5 | 6,0 | **MS.DC14.1010.EA** | A79T | 3 | 50,0 | 1,0 | DIN 6535 HA | 0,02 |
| **▼ ØDS = 7,5 mm** | | | | | | | | | |
| 1,5 | 7,5 | 8,0 | **MS.DC15.1520.EA** | A79V | 3 | 50,0 | 2,0 | DIN 6535 HA | 0,02 |
| 2,0 | 7,5 | 8,0 | **MS.DC15.2018.EA** | A79X | 3 | 50,0 | 1,8 | DIN 6535 HA | 0,02 |
| **▼ ØDS = 10,5 mm** | | | | | | | | | |
| 2,5 | 10,5 | 12,0 | **MS.DC17.2529.EA** | A79Z | 3 | 60,0 | 2,9 | DIN 6535 HA | 0,02 |
| 3,0 | 10,5 | 12,0 | **MS.DC17.3025.EA** | A791 | 3 | 60,0 | 2,5 | DIN 6535 HA | 0,02 |
| **▼ ØDS = 13,5 mm** | | | | | | | | | |
| 3,0 | 13,5 | 16,0 | **MS.DC18.3038.EA** | A793 | 3 | 70,0 | 3,8 | DIN 1835 A | 0,02 |
| 4,0 | 13,5 | 16,0 | **MS.DC18.4035.EA** | A795 | 3 | 70,0 | 3,5 | DIN 1835 A | 0,02 |
| **▼ ØDS = 16,5 mm** | | | | | | | | | |
| 5,0 | 16,5 | 16,0 | **MS.DC18.5045.EA** | A797 | 3 | 70,0 | 4,5 | DIN 1835 A | 0,02 |
| **▼ ØDS = 22,5 mm** | | | | | | | | | |
| 5,0 | 22,5 | 16,0 | **MS.DC18.5070.EA** | A799 | 3 | 70,0 | 7,0 | DIN 1835 A | 0,02 |
| **▼ ØDS = 25,5 mm** | | | | | | | | | |
| 6,0 | 25,5 | 16,0 | **MS.DC18.6076.EA** | A8AB | 3 | 70,0 | 7,6 | DIN 1835 A | 0,02 |

**Unsere Schneidstoffempfehlung für die Bearbeitung der Materialgruppen P und K: L1 U343**
**Ausgenommen sind MS.DC18.5070.EA und MS.DC18.6076.EA. Unsere Schneidstoffempfehlung für diese beiden Artikel: L1 U333**

**Our cutting grade recommendation for the machininig of the material groups P and K: L1 U343**
**Exceptions are XY and YZ. Our cutting grade recommendation for these items: L1 U333**

Für weitere Informationen wenden Sie sich bitte an unsere technische Fachberatung unter **support@kaestner.com** bzw. **+49 7473 9517 150.**
For further information, please contact our technical support at **support@kaestner.com** or **+49 7473 9517 150.**

Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade
Bestellbeispiel | Order example: **MS.DC14.1010.EA L1 U343 oder A79T L1 U343** (L1 U343 = Schneidstoff | Grade)

# Fräsen von Scheibenfedernuten und Schlitzfräsen (vgl. DIN 6535 HA)

Schaftfräser nach DIN 850 D/F zum Fräsen von Scheibenfedernuten nach DIN 6888 oder zum Schlitzfräsen. Kreuzverzahnt.

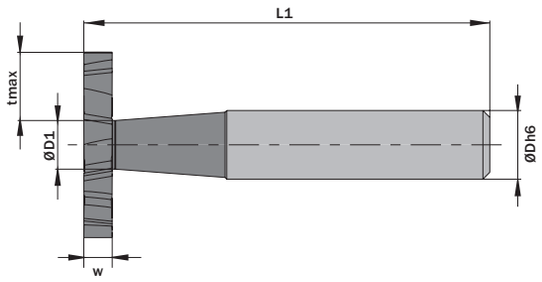
# Keyway and slot milling (DIN 6535 HA)

End mills according to DIN 850 D/F for keyway milling according to DIN 6888 or for slot milling. Staggered teeth.

Empfehlungen | Recommendations: **ab Seite | as of Page 63**
**H01.2**

Legende | Legend: **ab Seite | as of Page 62**

VHM | DIN 850DIF | HA DIN 6535 | TYP N | coated



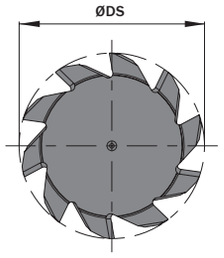




Abbildung ähnlich / Examplary image

Typ NF auf Anfrage erhältlich
Type NF available upon request

| w e8 mm | ØDS h11 mm | ØDh6 mm | Artikelnummer Part number | Webcode | Anzahl Schneiden Number of cutting edges | ØD1 mm | L1 mm | tmax mm | Für Scheibenfedern for Woodruff key | Vorschub fz Feed fz mm |
|---|---|---|---|---|---|---|---|---|---|---|
| **▼ w = 2,0 mm** | | | | | | | | | | |
| 2,0 | 10,5 | 6,0 | **MS.DJ1S.020.10.ZA** | A6PQ | 6 | 4,0 | 50,0 | 3,0 | 2,0x3,7 | 0,035–0,04 |
| 2,0 | 13,5 | 10,0 | **MS.DJ1S.020.13.ZA** | A6PV | 8 | 4,6 | 56,0 | 4,2 | 2,0x5,0 | 0,035–0,04 |
| **▼ w = 3,0 mm** | | | | | | | | | | |
| 3,0 | 10,5 | 6,0 | **MS.DJ1S.030.10.ZA** | A6PT | 6 | 4,2 | 50,0 | 2,9 | 3,0x3,7 | 0,035–0,04 |
| 3,0 | 13,5 | 10,0 | **MS.DJ1S.030.13.ZA** | A6PX | 8 | 4,6 | 56,0 | 4,2 | 3,0x5,0 | 0,035–0,04 |
| 3,0 | 16,5 | 10,0 | **MS.DJ1S.030.16.ZA** | A6P1 | 10 | 4,6 | 56,0 | 5,7 | 3,0x6,5 | 0,035–0,04 |
| 3,0 | 19,5 | 10,0 | **MS.DJ1S.030.19.ZA** | A6P5 | 10 | 5,6 | 63,0 | 6,7 | 3,0x7,5 | 0,035–0,04 |
| **▼ w = 4,0 mm** | | | | | | | | | | |
| 4,0 | 13,5 | 10,0 | **MS.DJ1S.040.13.ZA** | A6PZ | 8 | 4,6 | 56,0 | 4,2 | 4,0x5,0 | 0,035–0,04 |
| 4,0 | 16,5 | 10,0 | **MS.DJ1S.040.16.ZA** | A6P3 | 10 | 4,6 | 56,0 | 5,7 | 4,0x6,5 | 0,035–0,04 |
| 4,0 | 19,5 | 10,0 | **MS.DJ1S.040.19.ZA** | A6P7 | 10 | 5,6 | 63,0 | 6,7 | 4,0x7,5 | 0,035–0,04 |
| 4,0 | 22,5 | 10,0 | **MS.DJ1S.040.22.ZA** | A6P9 | 10 | 6,0 | 63,0 | 8,1 | 4,0x9,0 | 0,035–0,04 |
| **▼ w = 5,0 mm** | | | | | | | | | | |
| 5,0 | 25,5 | 10,0 | **MS.DJ1S.050.25.ZA** | A6QB | 10 | 7,5 | 63,0 | 8,7 | 5,0x10,0 | 0,035–0,04 |
| 5,0 | 28,5 | 10,0 | **MS.DJ1S.050.28.ZA** | A6QD | 10 | 8,5 | 63,0 | 9,7 | 5,0x11,0 | 0,035–0,04 |
| 5,0 | 32,5 | 12,0 | **MS.DJ1S.050.32.ZA** | A6QF | 10 | 8,5 | 71,0 | 11,7 | 5,0x13,0 | 0,035–0,04 |
| **▼ w = 10,0 mm** | | | | | | | | | | |
| 10,0 | 38,5 | 12,0 | **MS.DJ1S.100.38.ZA** | A6QH | 10 | 11,8 | 71,0 | 13,3 | 10,0x15,0 | 0,035–0,04 |
| 10,0 | 45,5 | 12,0 | **MS.DJ1S.100.45.ZA** | A6QK | 10 | 11,8 | 71,0 | 14,3 | 10,0x16,0 | 0,035–0,04 |

## Unsere Schneidstoff- und Schnittwertempfehlungen (Vc m/min) | Our cutting grade and cutting speed recommendations (Vc m/min)

Erklärung zu den Materialgruppen finden Sie auf Seite 69 | Explanations regarding the material groups can found on page 69

| Materialgruppen Material groups / Schneidstoff Cutting grade | P | | | | | | H | | K | | | M | | | S | | | | N | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PI | PII | PIII | PIV | PV | PVI | HI | HII | KI | KII | KIII | MI | MII | MIII | SI | SII | SIII | SIV | NI | NII | NIII | NIV | NV | NVI |
| **P1 U333** | **80** | **80** | **75** | **70** | **65** | 60 | - | - | **80** | **70** | **65** | **45** | - | - | - | - | - | - | - | - | - | - | - | - |

Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade
Bestellbeispiel | Order example: **MS.DJ1S.020.06.ZA.P1 U333 oder A6PQ P1 U333** (P1 U333 = Schneidstoff | Grade)

# Fräsen von Scheibenfedernuten und Schlitzfräsen, Weldon (vgl. DIN 6535 HB)

Schaftfräser nach DIN 850 D/F zum Fräsen von Scheibenfedernuten nach DIN 6888 oder zum Schlitzfräsen. Kreuzverzahnt.

# Keyway and slot milling, Weldon (DIN 6535 HB)

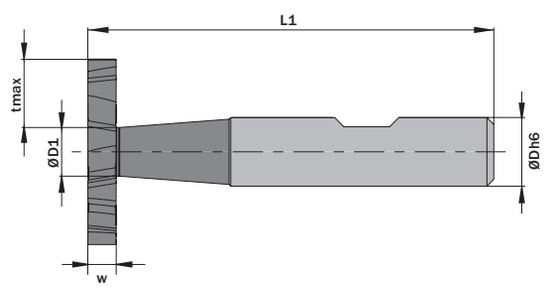
End mills according to DIN 850 D/F for keyway milling according to DIN 6888 or for slot milling. Staggered teeth.

Empfehlungen | Recommendations: **ab Seite | as of Page 63**

**H01.2**

Legende | Legend: **ab Seite | as of Page 62**

VHM | DIN 850D|F | HB DIN 6535 | TYP N | coated



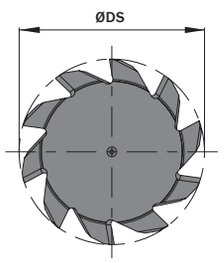




Abbildung ähnlich / Examplary image

Typ NF auf Anfrage erhältlich
Type NF available upon request

| w e8 mm | ØDS h11 mm | ØDh6 mm | Artikelnummer Part number | Webcode | Anzahl Schneiden Number of cutting edges | ØD1 mm | L1 mm | tmax mm | Für Scheibenfedern for Woodruff key | Vorschub fz Feed fz mm |
|---|---|---|---|---|---|---|---|---|---|---|
| **▼ w = 2,0 mm** | | | | | | | | | | |
| 2,0 | 10,5 | 6,0 | **MS.DJ1S.020.10.ZB** | A599 | 6 | 4,0 | 50,0 | 3,0 | 2,0x3,7 | 0,035–0,04 |
| 2,0 | 13,5 | 10,0 | **MS.DJ1S.020.13.ZB** | A6AD | 8 | 4,6 | 56,0 | 4,2 | 2,0x5,0 | 0,035–0,04 |
| **▼ w = 3,0 mm** | | | | | | | | | | |
| 3,0 | 10,5 | 6,0 | **MS.DJ1S.030.10.ZB** | A6AB | 6 | 4,2 | 50,0 | 2,9 | 3,0x3,7 | 0,035–0,04 |
| 3,0 | 13,5 | 10,0 | **MS.DJ1S.030.13.ZB** | A6AF | 8 | 4,6 | 56,0 | 4,2 | 3,0x5,0 | 0,035–0,04 |
| 3,0 | 16,5 | 10,0 | **MS.DJ1S.030.16.ZB** | A6AK | 10 | 4,6 | 56,0 | 5,7 | 3,0x6,5 | 0,035–0,04 |
| 3,0 | 19,5 | 10,0 | **MS.DJ1S.030.19.ZB** | A6AQ | 10 | 5,6 | 63,0 | 6,7 | 3,0x7,5 | 0,035–0,04 |
| **▼ w = 4,0 mm** | | | | | | | | | | |
| 4,0 | 13,5 | 10,0 | **MS.DJ1S.040.13.ZB** | A6AH | 8 | 4,6 | 56,0 | 4,2 | 4,0x5,0 | 0,035–0,04 |
| 4,0 | 16,5 | 10,0 | **MS.DJ1S.040.16.ZB** | A6AN | 10 | 4,6 | 56,0 | 5,7 | 4,0x6,5 | 0,035–0,04 |
| 4,0 | 19,5 | 10,0 | **MS.DJ1S.040.19.ZB** | A6AT | 10 | 5,6 | 63,0 | 6,7 | 4,0x7,5 | 0,035–0,04 |
| 4,0 | 22,5 | 10,0 | **MS.DJ1S.040.22.ZB** | A6AV | 10 | 6,0 | 63,0 | 8,1 | 4,0x9,0 | 0,035–0,04 |
| **▼ w = 5,0 mm** | | | | | | | | | | |
| 5,0 | 25,5 | 10,0 | **MS.DJ1S.050.25.ZB** | A6AX | 10 | 7,5 | 63,0 | 8,7 | 5,0x10,0 | 0,035–0,04 |
| 5,0 | 28,5 | 10,0 | **MS.DJ1S.050.28.ZB** | A6AZ | 10 | 8,5 | 63,0 | 9,7 | 5,0x11,0 | 0,035–0,04 |
| 5,0 | 32,5 | 12,0 | **MS.DJ1S.050.32.ZB** | A6A1 | 10 | 8,5 | 71,0 | 11,7 | 5,0x13,0 | 0,035–0,04 |
| **▼ w = 10,0 mm** | | | | | | | | | | |
| 10,0 | 38,5 | 12,0 | **MS.DJ1S.100.38.ZB** | A6A3 | 10 | 11,8 | 71,0 | 13,3 | 10,0x15,0 | 0,035–0,04 |
| 10,0 | 45,5 | 12,0 | **MS.DJ1S.100.45.ZB** | A6A5 | 10 | 11,8 | 71,0 | 14,3 | 10,0x16,0 | 0,035–0,04 |

## Unsere Schneidstoff- und Schnittwertempfehlungen (Vc m/min) | Our cutting grade and cutting speed recommendations (Vc m/min)

Erklärung zu den Materialgruppen finden Sie auf Seite 69 | Explanations regarding the material groups can found on page 69

| Materialgruppen / Material groups / Schneidstoff / Cutting grade | P | | | | | | H | | K | | | M | | | S | | | | N | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PI | PII | PIII | PIV | PV | PVI | HI | HII | KI | KII | KIII | MI | MII | MIII | SI | SII | SIII | SIV | NI | NII | NIII | NIV | NV | NVI |
| **P1 U333** | **80** | **80** | **75** | **70** | **65** | 60 | - | - | **80** | **70** | **65** | **45** | - | - | - | - | - | - | - | - | - | - | - | - |

Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade
Bestellbeispiel | Order example: **MS.DJ1S.020.06.ZB.P1 U333 oder A599 P1 U333** (P1 U333 = Schneidstoff | Grade)

# Winkelfräser Form A

Winkelfräser nach DIN 1833, Form A mit 45°.
Aufnahme nach DIN 6535 HA.

# Dovetail Milling Cutter Form A

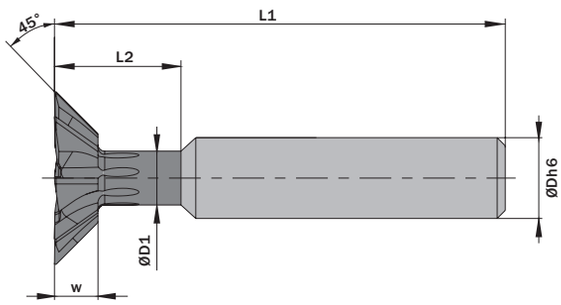
Dovetail milling cutter according to DIN 1833, Form A
with 45°. Shank according to DIN 6535 HA.

Empfehlungen | Recommendations: **ab Seite | as of Page 63**

**H01.2**

Legende | Legend: **ab Seite | as of Page 62**

VHM | FORM A | 45° | HA DIN 6535 | DIN 1833 | coated



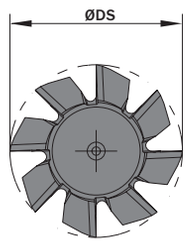




Abbildung ähnlich / Examplary image

| ØDS js16 mm | w js14 mm | ØDh6 mm | Artikelnummer Part number | Webcode | ØD1 mm | L1 mm | L2 mm | Anzahl Schneiden Number of cutting edges | Vorschub fz Feed fz mm |
|---|---|---|---|---|---|---|---|---|---|
| 12,0 | 3,0 | 10,0 | **MS.DK1S.030.12.EA** | A6QN | 5,0 | 55,0 | 12,0 | 6 | 0,033 – 0,045 |
| 16,0 | 4,0 | 10,0 | **MS.DK1S.040.16.EA** | A6QQ | 6,7 | 60,0 | 11,5 | 6 | 0,033 – 0,045 |
| 20,0 | 5,0 | 12,0 | **MS.DK1S.050.20.EA** | A6QT | 7,0 | 63,0 | 15,0 | 8 | 0,033 – 0,045 |
| 22,0 | 6,0 | 12,0 | **MS.DK1S.060.22.EA** | A6QV | 8,0 | 67,0 | 19,5 | 8 | 0,033 – 0,045 |
| 25,0 | 6,3 | 12,0 | **MS.DK1S.063.25.EA** | A6QX | 8,0 | 67,0 | 18,8 | 8 | 0,033 – 0,045 |
| 28,0 | 7,5 | 16,0 | **MS.DK1S.075.28.EA** | A6QZ | 8,5 | 80,0 | 27,0 | 9 | 0,033 – 0,045 |
| 32,0 | 8,0 | 16,0 | **MS.DK1S.080.32.EA** | A6Q1 | 13,0 | 71,0 | 21,0 | 9 | 0,033 – 0,045 |
| 38,0 | 10,0 | 16,0 | **MS.DK1S.100.38.EA** | A6Q3 | 15,0 | 80,0 | 30,5 | 9 | 0,033 – 0,045 |

## Unsere Schneidstoff- und Schnittwertempfehlungen (Vc m/min) | Our cutting grade and cutting speed recommendations (Vc m/min)

Erklärung zu den Materialgruppen finden Sie auf Seite 69 | Explanations regarding the material groups can found on page 69

| Materialgruppen Material groups / Schneidstoff Cutting grade | P | | | | | | H | | K | | | M | | | S | | | | N | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PI | PII | PIII | PIV | PV | PVI | HI | HII | KI | KII | KIII | MI | MII | MIII | SI | SII | SIII | SIV | NI | NII | NIII | NIV | NV | NVI |
| **P1 U333** | **110** | **90** | **85** | 80 | 60 | - | - | - | **100** | **90** | **85** | - | - | - | - | - | - | - | - | - | - | - | - | - |

Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade
Bestellbeispiel | Order example: **MS.DK1S.030.12.EA P1 U333 oder A6QN P1 U333** (P1 U333 = Schneidstoff | Grade)

# Winkelfräser Form C

Winkelfräser nach DIN 1833, Form C mit 45°.
Aufnahme nach DIN 6535 HB.

# Dovetail Milling Cutter Form C

Dovetail milling cutter according to DIN 1833, Form C with 45°. Shank according to DIN 6535 HB.

Empfehlungen | Recommendations: **ab Seite | as of Page 63**

**H01.2**

Legende | Legend: **ab Seite | as of Page 62**

VHM | FORM C | 45° | HB DIN6535 | DIN 1833 | coated

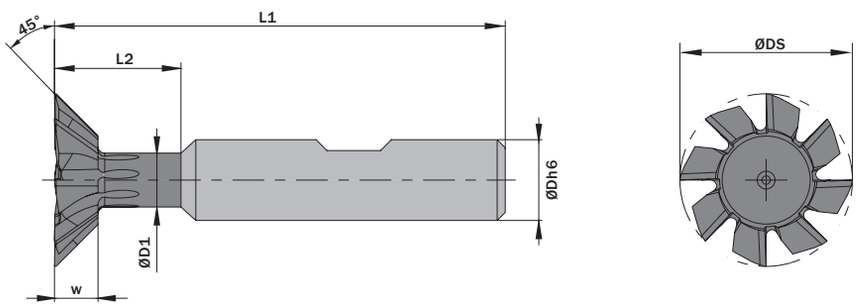



Abbildung ähnlich / Examplary image

| ØDS js16 | w js14 | ØDh6 | Artikelnummer Part number | Webcode | ØD1 | L1 | L2 | Anzahl Schneiden Number of cutting edges | Vorschub fz Feed fz |
|---|---|---|---|---|---|---|---|---|---|
| mm | mm | mm | | | mm | mm | mm | | mm |
| 12,0 | 3,0 | 10,0 | **MS.DK1S.030.12.EB** | A6A7 | 5,0 | 55,0 | 12,0 | 6 | 0,033 – 0,045 |
| 16,0 | 4,0 | 10,0 | **MS.DK1S.040.16.EB** | A6A9 | 6,7 | 60,0 | 11,5 | 6 | 0,033 – 0,045 |
| 20,0 | 5,0 | 12,0 | **MS.DK1S.050.20.EB** | A6BB | 7,0 | 63,0 | 15,0 | 8 | 0,033 – 0,045 |
| 22,0 | 6,0 | 12,0 | **MS.DK1S.060.22.EB** | A6BD | 8,0 | 67,0 | 19,5 | 8 | 0,033 – 0,045 |
| 25,0 | 6,3 | 12,0 | **MS.DK1S.063.25.EB** | A6BF | 8,0 | 67,0 | 18,8 | 8 | 0,033 – 0,045 |
| 28,0 | 7,5 | 16,0 | **MS.DK1S.075.28.EB** | A6BH | 8,5 | 80,0 | 27,0 | 9 | 0,033 – 0,045 |
| 32,0 | 8,0 | 16,0 | **MS.DK1S.080.32.EB** | A6BK | 13,0 | 71,0 | 21,0 | 9 | 0,033 – 0,045 |
| 38,0 | 10,0 | 16,0 | **MS.DK1S.100.38.EB** | A6BN | 15,0 | 80,0 | 30,5 | 9 | 0,033 – 0,045 |

## Unsere Schneidstoff- und Schnittwertempfehlungen (Vc m/min) | Our cutting grade and cutting speed recommendations (Vc m/min)

Erklärung zu den Materialgruppen finden Sie auf Seite 69 | Explanations regarding the material groups can found on page 69

| Materialgruppen Material groups / Schneidstoff Cutting grade | P | | | | | | H | | K | | | M | | | S | | | | N | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | P I | P II | P III | P IV | P V | P VI | H I | H II | K I | K II | K III | M I | M II | M III | S I | S II | S III | S IV | N I | N II | N III | N IV | N V | N VI |
| **P1 U333** | **110** | **90** | **85** | 80 | 60 | - | - | - | **100** | **90** | **85** | - | - | - | - | - | - | - | - | - | - | - | - | - |

Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade
Bestellbeispiel | Order example: **MS.DK1S.030.12.EB P1 U333 oder A6A7 P1 U333** (P1 U333 = Schneidstoff | Grade)

# Winkelfräser Form A

Winkelfräser nach DIN 1833, Form A mit 60°.
Aufnahme nach DIN 6535 HA.

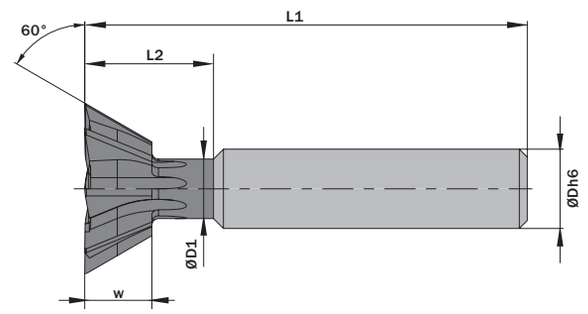
# Dovetail Milling Cutter Form A

Dovetail milling cutter according to DIN 1833, Form A with 60°. Shank according to DIN 6535 HA.

Empfehlungen | Recommendations: **ab Seite | as of Page 63**

**H01.2**

Legende | Legend: **ab Seite | as of Page 62**



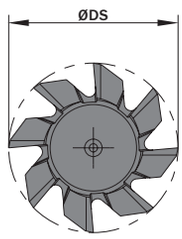




Abbildung ähnlich / Examplary image

| ØDS js16 | w js14 | ØDh6 | Artikelnummer Part number | Webcode | ØD1 | L1 | L2 | Anzahl Schneiden Number of cutting edges | Vorschub fz Feed fz |
|---|---|---|---|---|---|---|---|---|---|
| mm | mm | mm | | | mm | mm | mm | | mm |
| 12,0 | 5,0 | 10,0 | **MS.DN1S.050.12.EA** | A6SN | 5,0 | 55,0 | 12,0 | 6 | 0,033 – 0,045 |
| 16,0 | 6,3 | 10,0 | **MS.DN1S.063.16.EA** | A6SQ | 6,0 | 60,0 | 11,8 | 6 | 0,033 – 0,045 |
| 20,0 | 8,0 | 12,0 | **MS.DN1S.080.20.EA** | A6ST | 7,8 | 63,0 | 15,5 | 8 | 0,033 – 0,045 |
| 22,0 | 9,0 | 12,0 | **MS.DN1S.090.22.EA** | A6SV | 10,0 | 67,0 | 20,0 | 8 | 0,033 – 0,045 |
| 25,0 | 10,0 | 12,0 | **MS.DN1S.100.25.EA** | A6SX | 9,0 | 67,0 | 19,5 | 8 | 0,033 – 0,045 |
| 28,0 | 11,0 | 16,0 | **MS.DN1S.110.28.EA** | A6SZ | 13,0 | 80,0 | 26,5 | 9 | 0,033 – 0,045 |
| 32,0 | 12,5 | 16,0 | **MS.DN1S.125.32.EA** | A6S1 | 15,0 | 71,0 | 21,0 | 9 | 0,033 – 0,045 |
| 38,0 | 16,0 | 16,0 | **MS.DN1S.160.38.EA** | A6S3 | 15,0 | 80,0 | 30,5 | 9 | 0,033 – 0,045 |

## Unsere Schneidstoff- und Schnittwertempfehlungen (Vc m/min) | Our cutting grade and cutting speed recommendations (Vc m/min)

Erklärung zu den Materialgruppen finden Sie auf Seite 69 | Explanations regarding the material groups can found on page 69

| Materialgruppen Material groups / Schneidstoff Cutting grade | P | | | | | | H | | K | | | M | | | S | | | | N | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | P I | P II | P III | P IV | P V | P VI | H I | H II | K I | K II | K III | M I | M II | M III | S I | S II | S III | S IV | N I | N II | N III | N IV | N V | N VI |
| **P1 U333** | **110** | **90** | **85** | 80 | 60 | - | - | - | **100** | **90** | **85** | - | - | - | - | - | - | - | - | - | - | - | - | - |

Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade
Bestellbeispiel | Order example: **MS.DN1S.050.12.EA P1 U333 oder A6SN P1 U333** (P1 U333 = Schneidstoff | Grade)

# Winkelfräser Form C

Winkelfräser nach DIN 1833, Form C mit 60°.
Aufnahme nach DIN 6535 HB.

# Dovetail Milling Cutter Form C

Dovetail milling cutter according to DIN 1833, Form C
with 60°. Shank according to DIN 6535 HB.

Empfehlungen | Recommendations: **ab Seite | as of Page 63**

**H01.2**

Legende | Legend: **ab Seite | as of Page 62**

VHM | FORM C | 60° | HB DIN6535 | DIN 1833 | coated

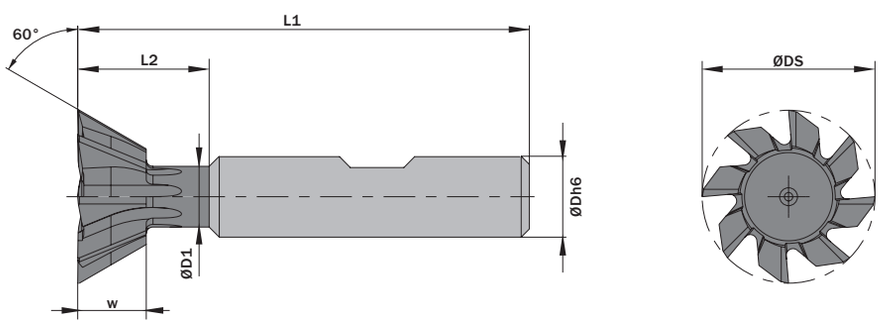



Abbildung ähnlich / Examplary image

| ØDS js16 | w js14 | ØDh6 | Artikelnummer Part number | Webcode | ØD1 | L1 | L2 | Anzahl Schneiden Number of cutting edges | Vorschub fz Feed fz |
|---|---|---|---|---|---|---|---|---|---|
| mm | mm | mm | | | mm | mm | mm | | mm |
| 12,0 | 5,0 | 10,0 | **MS.DN1S.050.12.EB** | A6B7 | 5,0 | 55,0 | 12,0 | 6 | 0,033 – 0,045 |
| 16,0 | 6,3 | 10,0 | **MS.DN1S.063.16.EB** | A6B9 | 6,0 | 60,0 | 11,8 | 6 | 0,033 – 0,045 |
| 20,0 | 8,0 | 12,0 | **MS.DN1S.080.20.EB** | A6CB | 7,8 | 63,0 | 15,5 | 8 | 0,033 – 0,045 |
| 22,0 | 9,0 | 12,0 | **MS.DN1S.090.22.EB** | A6CD | 10,0 | 67,0 | 20,0 | 8 | 0,033 – 0,045 |
| 25,0 | 10,0 | 12,0 | **MS.DN1S.100.25.EB** | A6CF | 9,0 | 67,0 | 19,5 | 8 | 0,033 – 0,045 |
| 28,0 | 11,0 | 16,0 | **MS.DN1S.110.28.EB** | A6CH | 13,0 | 80,0 | 26,5 | 9 | 0,033 – 0,045 |
| 32,0 | 12,5 | 16,0 | **MS.DN1S.125.32.EB** | A6CK | 15,0 | 71,0 | 21,0 | 9 | 0,033 – 0,045 |
| 38,0 | 16,0 | 16,0 | **MS.DN1S.160.38.EB** | A6CN | 15,0 | 80,0 | 30,5 | 9 | 0,033 – 0,045 |

## Unsere Schneidstoff- und Schnittwertempfehlungen (Vc m/min) | Our cutting grade and cutting speed recommendations (Vc m/min)

Erklärung zu den Materialgruppen finden Sie auf Seite 69 | Explanations regarding the material groups can found on page 69

| Materialgruppen Material groups / Schneidstoff Cutting grade | P | | | | | | H | | K | | | M | | | S | | | | N | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PI | PII | PIII | PIV | PV | PVI | HI | HII | KI | KII | KIII | MI | MII | MIII | SI | SII | SIII | SIV | NI | NII | NIII | NIV | NV | NVI |
| **P1 U333** | **110** | **90** | **85** | 80 | 60 | - | - | - | **100** | **90** | **85** | - | - | - | - | - | - | - | - | - | - | - | - | - |

Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade
Bestellbeispiel | Order example: **MS.DN1S.050.12.EB P1 U333 oder A6B7 P1 U333** (P1 U333 = Schneidstoff | Grade)

# Winkelfräser Form B

Winkelfräser nach DIN 1833, Form B mit 45°.
Aufnahme nach DIN 6535 HA.

# Dovetail Milling Cutter Form B

Dovetail milling cutter according to DIN 1833, Form B
with 45°. Shank according to DIN 6535 HA.

Empfehlungen | Recommendations: **ab Seite | as of Page 63**

**H01.2**

Legende | Legend: **ab Seite | as of Page 62**

VHM | FORM B | 45° | HA DIN 6535 | DIN 1833 | coated

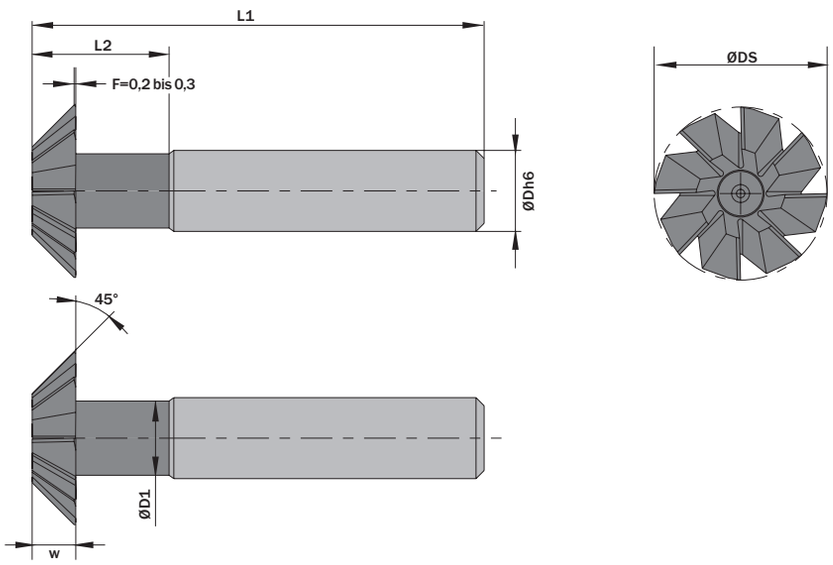



Abbildung ähnlich / Examplary image

| ØDS js16 | w js14 | ØDh6 | Artikelnummer Part number | Webcode | ØD1 | L1 | L2 | Anzahl Schneiden Number of cutting edges | Vorschub fz Feed fz |
|---|---|---|---|---|---|---|---|---|---|
| mm | mm | mm | | | mm | mm | mm | | mm |
| 12,0 | 3,0 | 10,0 | **MS.DL1S.030.12.EA** | A6Q5 | 5,0 | 55,0 | 12,0 | 6 | 0,033 – 0,045 |
| 16,0 | 4,0 | 10,0 | **MS.DL1S.040.16.EA** | A6Q7 | 8,0 | 60,0 | 11,5 | 6 | 0,033 – 0,045 |
| 20,0 | 5,0 | 12,0 | **MS.DL1S.050.20.EA** | A6Q9 | 10,0 | 63,0 | 15,5 | 8 | 0,033 – 0,045 |
| 22,0 | 6,0 | 12,0 | **MS.DL1S.060.22.EA** | A6SB | 10,2 | 67,0 | 19,5 | 8 | 0,033 – 0,045 |
| 25,0 | 6,3 | 12,0 | **MS.DL1S.063.25.EA** | A6SD | 11,0 | 67,0 | 20,3 | 8 | 0,033 – 0,045 |
| 28,0 | 7,5 | 16,0 | **MS.DL1S.075.28.EA** | A6SF | 14,0 | 80,0 | 30,0 | 10 | 0,033 – 0,045 |
| 32,0 | 8,0 | 16,0 | **MS.DL1S.080.32.EA** | A6SH | 15,0 | 71,0 | 21,0 | 10 | 0,033 – 0,045 |
| 38,0 | 10,0 | 16,0 | **MS.DL1S.100.38.EA** | A6SK | 15,0 | 80,0 | 30,5 | 10 | 0,033 – 0,045 |

## Unsere Schneidstoff- und Schnittwertempfehlungen (Vc m/min) | Our cutting grade and cutting speed recommendations (Vc m/min)

Erklärung zu den Materialgruppen finden Sie auf Seite 69 | Explanations regarding the material groups can found on page 69

| Materialgruppen Material groups / Schneidstoff Cutting grade | P | | | | | | H | | K | | | M | | | S | | | | N | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PI | PII | PIII | PIV | PV | PVI | HI | HII | KI | KII | KIII | MI | MII | MIII | SI | SII | SIII | SIV | NI | NII | NIII | NIV | NV | NVI |
| **P1 U333** | **110** | **90** | **85** | 80 | 60 | - | - | - | **100** | **90** | **85** | - | - | - | - | - | - | - | - | - | - | - | - | - |

Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade
Bestellbeispiel | Order example: **MS.DL1S.030.12.EA.P1 U333 oder A6Q5 P1 U333** (P1 U333 = Schneidstoff | Grade)

# Winkelfräser Form D

Winkelfräser nach DIN 1833, Form D mit 45°.
Aufnahme nach DIN 6535 HB.

# Dovetail Milling Cutter Form D

Dovetail milling cutter according to DIN 1833, Form D
with 45°. Shank according to DIN 6535 HB.

Empfehlungen | Recommendations: **ab Seite | as of Page 63**
**H01.2**

Legende | Legend: **ab Seite | as of Page 62**

VHM | FORM D | 45° | HB DIN 6535 | DIN 1833 | coated

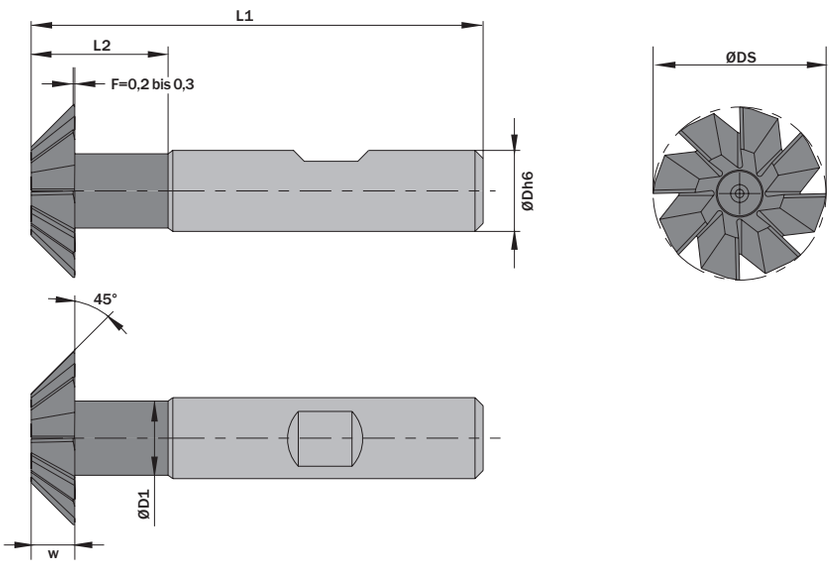



Abbildung ähnlich / Examplary image

| ØDS js16 | w js14 | ØDh6 | Artikelnummer Part number | Webcode | ØD1 | L1 | L2 | Anzahl Schneiden Number of cutting edges | Vorschub fz Feed fz |
|---|---|---|---|---|---|---|---|---|---|
| mm | mm | mm | | | mm | mm | mm | | mm |
| 12,0 | 3,0 | 10,0 | **MS.DL1S.030.12.EB** | A6BQ | 5,0 | 55,0 | 12,0 | 6 | 0,033 – 0,045 |
| 16,0 | 4,0 | 10,0 | **MS.DL1S.040.16.EB** | A6BT | 8,0 | 60,0 | 11,5 | 6 | 0,033 – 0,045 |
| 20,0 | 5,0 | 12,0 | **MS.DL1S.050.20.EB** | A6BV | 10,0 | 63,0 | 15,5 | 8 | 0,033 – 0,045 |
| 22,0 | 6,0 | 12,0 | **MS.DL1S.060.22.EB** | A6BX | 10,2 | 67,0 | 19,5 | 8 | 0,033 – 0,045 |
| 25,0 | 6,3 | 12,0 | **MS.DL1S.063.25.EB** | A6BZ | 11,0 | 67,0 | 20,3 | 8 | 0,033 – 0,045 |
| 28,0 | 7,5 | 16,0 | **MS.DL1S.075.28.EB** | A6B1 | 14,0 | 80,0 | 30,0 | 10 | 0,033 – 0,045 |
| 32,0 | 8,0 | 16,0 | **MS.DL1S.080.32.EB** | A6B3 | 15,0 | 71,0 | 21,0 | 10 | 0,033 – 0,045 |
| 38,0 | 10,0 | 16,0 | **MS.DL1S.100.38.EB** | A6B5 | 15,0 | 80,0 | 30,5 | 10 | 0,033 – 0,045 |

## Unsere Schneidstoff- und Schnittwertempfehlungen (Vc m/min) | Our cutting grade and cutting speed recommendations (Vc m/min)

Erklärung zu den Materialgruppen finden Sie auf Seite 69 | Explanations regarding the material groups can found on page 69

| Materialgruppen Material groups / Schneidstoff Cutting grade | P | | | | | | H | | K | | | M | | | S | | | | N | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | P I | P II | P III | P IV | P V | P VI | H I | H II | K I | K II | K III | M I | M II | M III | S I | S II | S III | S IV | N I | N II | N III | N IV | N V | N VI |
| **P1 U333** | **110** | **90** | **85** | 80 | 60 | - | - | - | **100** | **90** | **85** | - | - | - | - | - | - | - | - | - | - | - | - | - |

Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade
Bestellbeispiel | Order example: **MS.DL1S.030.12.EB P1 U333 oder A6BQ P1 U333** (P1 U333 = Schneidstoff | Grade)

# Winkelfräser Form B

Winkelfräser nach DIN 1833, Form B mit 60°.
Aufnahme nach DIN 6535 HA.

# Dovetail Milling Cutter Form B

Dovetail milling cutter according to DIN 1833, Form B
with 60°. Shank according to DIN 6535 HA.

Empfehlungen | Recommendations: **ab Seite | as of Page 63**
**H01.2**

Legende | Legend: **ab Seite | as of Page 62**

VHM | FORM B | 60° | HA DIN 6535 | DIN 1833 | coated

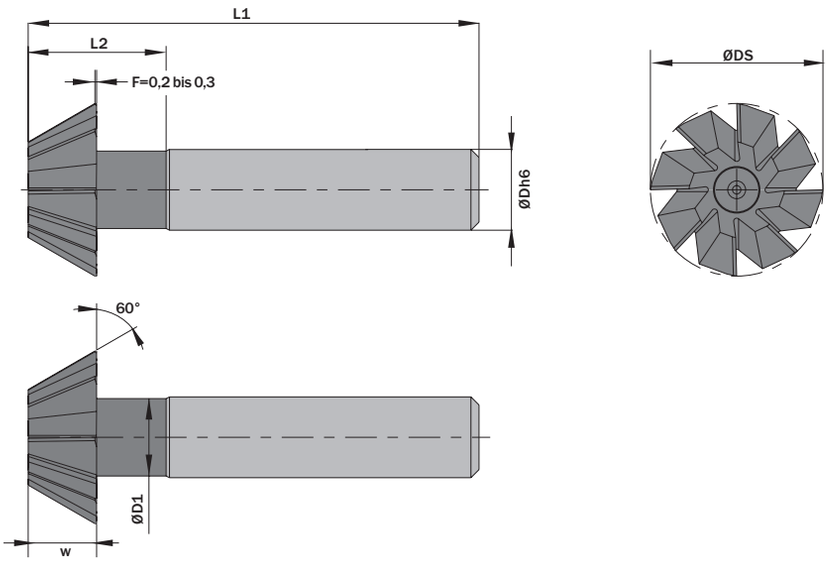



Abbildung ähnlich / Examplary image

| ØDS js16 | w js14 | ØDh6 | Artikelnummer Part number | Webcode | ØD1 | L1 | L2 | Anzahl Schneiden Number of cutting edges | Vorschub fz Feed fz |
|---|---|---|---|---|---|---|---|---|---|
| mm | mm | mm | | | mm | mm | mm | | mm |
| 12,0 | 5,0 | 10,0 | **MS.DP1S.050.12.EA** | A6S5 | 5,0 | 55,0 | 12,0 | 6 | 0,033 – 0,045 |
| 16,0 | 6,3 | 10,0 | **MS.DP1S.063.16.EA** | A6S7 | 8,2 | 60,0 | 13,3 | 6 | 0,033 – 0,045 |
| 20,0 | 8,0 | 12,0 | **MS.DP1S.080.20.EA** | A6S9 | 10,5 | 63,0 | 16,5 | 8 | 0,033 – 0,045 |
| 22,0 | 9,0 | 12,0 | **MS.DP1S.090.22.EA** | A6TB | 10,2 | 67,0 | 20,5 | 8 | 0,033 – 0,045 |
| 25,0 | 10,0 | 12,0 | **MS.DP1S.100.25.EA** | A6TD | 11,5 | 67,0 | 20,5 | 8 | 0,033 – 0,045 |
| 28,0 | 11,0 | 16,0 | **MS.DP1S.110.28.EA** | A6TF | 14,0 | 80,0 | 30,5 | 10 | 0,033 – 0,045 |
| 32,0 | 12,5 | 16,0 | **MS.DP1S.125.32.EA** | A6TH | 15,0 | 71,0 | 21,0 | 10 | 0,033 – 0,045 |
| 38,0 | 16,0 | 16,0 | **MS.DP1S.160.38.EA** | A6TK | 15,0 | 80,0 | 30,0 | 10 | 0,033 – 0,045 |

## Unsere Schneidstoff- und Schnittwertempfehlungen (Vc m/min) | Our cutting grade and cutting speed recommendations (Vc m/min)

Erklärung zu den Materialgruppen finden Sie auf Seite 69 | Explanations regarding the material groups can found on page 69

| Materialgruppen / Material groups | P | | | | | | H | | K | | | M | | | S | | | | N | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Schneidstoff / Cutting grade | PI | PII | PIII | PIV | PV | PVI | HI | HII | KI | KII | KIII | MI | MII | MIII | SI | SII | SIII | SIV | NI | NII | NIII | NIV | NV | NVI |
| **P1 U333** | **110** | **90** | **85** | 80 | 60 | - | - | - | **100** | **90** | **85** | - | - | - | - | - | - | - | - | - | - | - | - | - |

Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade
Bestellbeispiel | Order example: **MS.DP1S.050.12.EA.P1 U333 oder A6S5 P1 U333** (P1 U333 = Schneidstoff | Grade)

# Winkelfräser Form D

Winkelfräser nach DIN 1833, Form D mit 60°.
Aufnahme nach DIN 6535 HB.

# Dovetail Milling Cutter Form D

Dovetail milling cutter according to DIN 1833, Form D
with 60°. Shank according to DIN 6535 HB.

Empfehlungen | Recommendations: **ab Seite | as of Page 63**

**H01.2**

Legende | Legend: **ab Seite | as of Page 62**

VHM | FORM D | 60° | HB DIN 6535 | DIN 1833 | coated

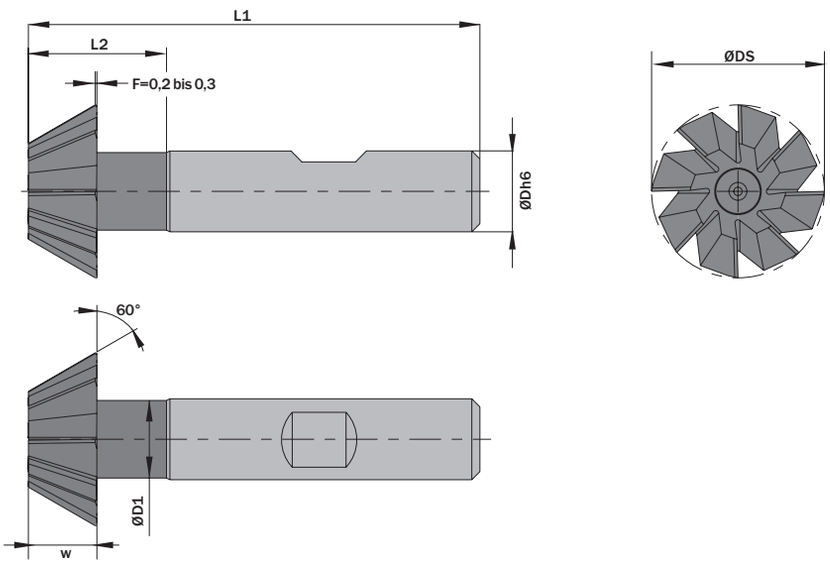



Abbildung ähnlich / Examplary image

| ØDS js16 | w js14 | ØDh6 | Artikelnummer Part number | Webcode | ØD1 | L1 | L2 | Anzahl Schneiden Number of cutting edges | Vorschub fz Feed fz |
|---|---|---|---|---|---|---|---|---|---|
| mm | mm | mm | | | mm | mm | mm | | mm |
| 12,0 | 5,0 | 10,0 | **MS.DP1S.050.12.EB** | A6CQ | 5,0 | 55,0 | 12,0 | 6 | 0,033 – 0,045 |
| 16,0 | 6,3 | 10,0 | **MS.DP1S.063.16.EB** | A6CT | 8,2 | 60,0 | 13,3 | 6 | 0,033 – 0,045 |
| 20,0 | 8,0 | 12,0 | **MS.DP1S.080.20.EB** | A6CV | 10,5 | 63,0 | 16,5 | 8 | 0,033 – 0,045 |
| 22,0 | 9,0 | 12,0 | **MS.DP1S.090.22.EB** | A6CX | 10,2 | 67,0 | 20,5 | 8 | 0,033 – 0,045 |
| 25,0 | 10,0 | 12,0 | **MS.DP1S.100.25.EB** | A6CZ | 11,5 | 67,0 | 20,5 | 8 | 0,033 – 0,045 |
| 28,0 | 11,0 | 16,0 | **MS.DP1S.110.28.EB** | A6C1 | 14,0 | 80,0 | 30,5 | 10 | 0,033 – 0,045 |
| 32,0 | 12,5 | 16,0 | **MS.DP1S.125.32.EB** | A6C3 | 15,0 | 71,0 | 21,0 | 10 | 0,033 – 0,045 |
| 38,0 | 16,0 | 16,0 | **MS.DP1S.160.38.EB** | A6C5 | 15,0 | 80,0 | 30,0 | 10 | 0,033 – 0,045 |

## Unsere Schneidstoff- und Schnittwertempfehlungen (Vc m/min) | Our cutting grade and cutting speed recommendations (Vc m/min)

Erklärung zu den Materialgruppen finden Sie auf Seite 69 | Explanations regarding the material groups can found on page 69

| Materialgruppen Material groups / Schneidstoff Cutting grade | P | | | | | | H | | K | | | M | | | S | | | | N | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PI | PII | PIII | PIV | PV | PVI | HI | HII | KI | KII | KIII | MI | MII | MIII | SI | SII | SIII | SIV | NI | NII | NIII | NIV | NV | NVI |
| **P1 U333** | **110** | **90** | **85** | 80 | 60 | - | - | - | **100** | **90** | **85** | - | - | - | - | - | - | - | - | - | - | - | - | - |

Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade
Bestellbeispiel | Order example: **MS.DP1S.050.12.EB.P1 U333 oder A6CQ P1 U333** (P1 U333 = Schneidstoff | Grade)

# HPC Fräser für Schrupp- und Schlichtbearbeitungen

Universelle Einsatzmöglichkeiten dank Hochleistungsgeometrie sowie vibrationsarme, laufruhige Bearbeitungen dank Ungleichteilung der Schneiden. Werkzeugauslegung nach Werksnorm. Aufnahme nach DIN 6535 HA.

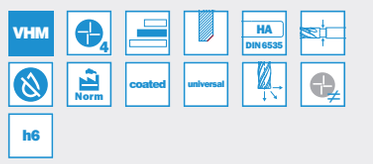
# HPC milling cutter for roughing and finishing operations

Universal application possibilities thanks to high-performance geometry as well as low-vibration, smooth-running machining thanks to unequal division of the cutting edges. Tool design according to company standard. Shank according to DIN 6535 HA.

Empfehlungen | Recommendations: **ab Seite | as of Page 63**

**H01.2**

Legende | Legend: **ab Seite | as of Page 62**



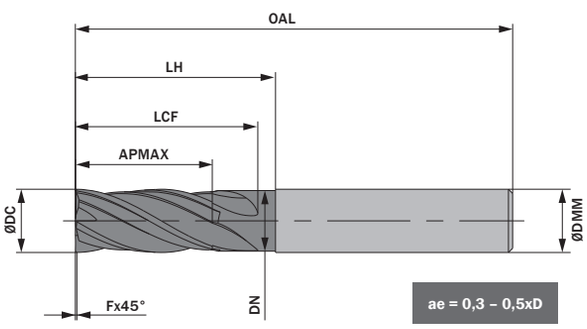




Abbildung ähnlich / Examplary image

**Bitte beachten Sie die unterschiedlichen Schneidstoff- und Schnittwerteempfehlungen je nach ØDC unten. | Please note the different cutting grade and cutting speed recommendations according to ØDC below.**

| ØDC h10 | DN -0,15 | Fx45° | Artikelnummer Part number | Webcode | APMAX | LCF | ØDMM | LH | OAL | Vorschub Feed |
|---|---|---|---|---|---|---|---|---|---|---|
| mm | mm | mm | | | mm | mm | mm | mm | mm | |
| 3,0 | 2,5 | 0,13 | **MS.DD13.0304.EA** | BB0U | 8,0 | 14,0 | 6,0 | 18,0 | 57,0 | 0,007 – 0,030 |
| 4,0 | 3,5 | 0,18 | **MS.DD13.0404.EA** | BB0W | 11,0 | 17,0 | 6,0 | 21,0 | 57,0 | 0,010 – 0,037 |
| 5,0 | 4,5 | 0,2 | **MS.DD13.0504.EA** | BB0Y | 13,0 | 19,0 | 6,0 | 21,0 | 57,0 | 0,014 – 0,037 |
| 6,0 | 5,5 | 0,2 | **MS.DD13.0604.EA** | BB00 | 13,0 | 19,0 | 6,0 | 21,0 | 57,0 | 0,025 – 0,042 |
| 7,0 | 6,5 | 0,2 | **MS.DD13.0704.EA** | BB02 | 19,0 | 25,0 | 8,0 | 27,0 | 63,0 | 0,031 – 0,047 |
| 8,0 | 7,5 | 0,2 | **MS.DD13.0804.EA** | BB04 | 19,0 | 25,0 | 8,0 | 27,0 | 63,0 | 0,031 – 0,052 |
| 9,0 | 8,5 | 0,3 | **MS.DD13.0904.EA** | BB06 | 22,0 | 28,0 | 10,0 | 32,0 | 72,0 | 0,032 – 0,060 |
| 10,0 | 9,5 | 0,3 | **MS.DD13.1004.EA** | BB08 | 22,0 | 28,0 | 10,0 | 32,0 | 72,0 | 0,040 – 0,074 |
| 11,0 | 10,5 | 0,3 | **MS.DD13.1104.EA** | BB1A | 26,0 | 32,0 | 12,0 | 38,0 | 83,0 | 0,048 – 0,082 |
| 12,0 | 11,5 | 0,3 | **MS.DD13.1204.EA** | BB1C | 26,0 | 32,0 | 12,0 | 38,0 | 83,0 | 0,057 – 0,090 |
| 14,0 | 13,5 | 0,3 | **MS.DD13.1404.EA** | BB1E | 26,0 | 32,0 | 14,0 | 39,0 | 83,0 | 0,068 – 0,112 |
| 16,0 | 15,5 | 0,4 | **MS.DD13.1604.EA** | BB1G | 32,0 | 38,0 | 16,0 | 44,0 | 92,0 | 0,088 – 0,134 |
| 18,0 | 17,5 | 0,4 | **MS.DD13.1804.EA** | BB1J | 32,0 | 38,0 | 18,0 | 50,0 | 92,0 | 0,110 – 0,160 |
| 20,0 | 19,5 | 0,5 | **MS.DD13.2004.EA** | BB1M | 38,0 | 44,0 | 20,0 | 54,0 | 104,0 | 0,128 – 0,180 |

| | | | |
|---|---|---|---|
| **SET 1** | 4-teiliges Set \| Set of 4 pieces<br>**Ø DC 6,0 / 8,0 / 10,0 / 12,0 mm** | Bestellnummer / Order number<br>**MS.S1.DD13.EA N1 U333** | Webcode<br>**BC8B** |
| **SET 2** | 5-teiliges Set \| Set of 5 pieces<br>**Ø DC 6,0 / 8,0 / 10,0 / 12,0 / 16,0 mm** | Bestellnummer / Order number<br>**MS.S2.DD13.EA N1 U333** | Webcode<br>**BC8F** |

## Unsere Schneidstoff- und Schnittwertempfehlungen (Vc m/min) | Our cutting grade and cutting speed recommendations (Vc m/min)

Erklärung zu den Materialgruppen finden Sie auf Seite 69 | Explanations regarding the material groups can found on page 69

| Materialgruppen Material groups / Schneidstoff Cutting grade | P | | | | | | H | | K | | | M | | | S | | | | N | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PI | PII | PIII | PIV | PV | PVI | HI | HII | KI | KII | KIII | MI | MII | MIII | SI | SII | SIII | SIV | NI | NII | NIII | NIV | NV | NVI |
| **N1 U343** | **Schnittwertempfehlungen \| Cutting speed recommendations ØDC 3,0 – 5,0 mm** | | | | | | | | | | | | | | | | | | | | | | | |
| | **175** | **165** | **140** | **120** | **80** | **110** | **95** | - | **120** | **105** | **95** | 100 | 70 | 60 | 60 | - | 30 | - | - | - | - | - | - | - |
| **N1 U333** | **Schnittwertempfehlungen \| Cutting speed recommendations ØDC 6,0 – 20,0 mm** | | | | | | | | | | | | | | | | | | | | | | | |
| | **175** | **165** | **140** | **120** | **80** | **110** | **95** | - | **120** | **105** | **95** | 100 | 70 | 60 | 60 | - | 30 | - | - | - | - | - | - | - |

Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade
Bestellbeispiel | Order example: **MS.DD13.0304.EA N1 U343 oder BB0U N1 U343** (N1 U343 = Schneidstoff | Grade)

# HPC Fräser für Schrupp- und Schlichtbearbeitungen

Universelle Einsatzmöglichkeiten dank Hochleistungsgeometrie sowie vibrationsarme, laufruhige Bearbeitungen dank Ungleichteilung der Schneiden. Werkzeugauslegung nach Werksnorm. Aufnahme nach DIN 6535 HB.

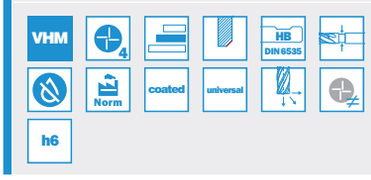
# HPC milling cutter for roughing and finishing operations

Universal application possibilities thanks to high-performance geometry as well as low-vibration, smooth-running machining thanks to unequal division of the cutting edges. Tool design according to company standard. Shank according to DIN 6535 HB.

Empfehlungen | Recommendations: **ab Seite | as of Page 63**

**H01.2**

Legende | Legend: **ab Seite | as of Page 62**



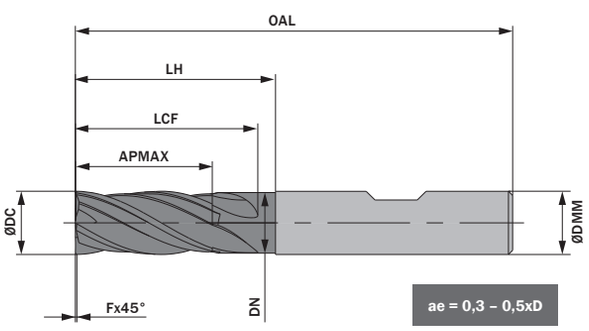




Abbildung ähnlich / Examplary image

**Bitte beachten Sie die unterschiedlichen Schneidstoff- und Schnittwerteempfehlungen je nach ØDC unten. | Please note the different cutting grade and cutting speed recommendations according to ØDC below.**

| ØDC h10 | DN -0,15 | Fx45° | Artikelnummer Part number | Webcode | APMAX | LCF | ØDMM | LH | OAL | Vorschub Feed |
|---|---|---|---|---|---|---|---|---|---|---|
| mm | mm | mm | | | mm | mm | mm | mm | mm | |
| 3,0 | 2,5 | 0,13 | **MS.DD13.0304.EB** | BCA2 | 8,0 | 14,0 | 6,0 | 18,0 | 57,0 | 0,007 – 0,030 |
| 4,0 | 3,5 | 0,18 | **MS.DD13.0404.EB** | BCA4 | 11,0 | 17,0 | 6,0 | 21,0 | 57,0 | 0,010 – 0,037 |
| 5,0 | 4,5 | 0,2 | **MS.DD13.0504.EB** | BCA6 | 13,0 | 19,0 | 6,0 | 21,0 | 57,0 | 0,014 – 0,037 |
| 6,0 | 5,5 | 0,2 | **MS.DD13.0604.EB** | BCA8 | 13,0 | 19,0 | 6,0 | 21,0 | 57,0 | 0,025 – 0,042 |
| 7,0 | 6,5 | 0,2 | **MS.DD13.0704.EB** | BCBA | 19,0 | 25,0 | 8,0 | 27,0 | 63,0 | 0,031 – 0,047 |
| 8,0 | 7,5 | 0,2 | **MS.DD13.0804.EB** | BCBC | 19,0 | 25,0 | 8,0 | 27,0 | 63,0 | 0,031 – 0,052 |
| 9,0 | 8,5 | 0,3 | **MS.DD13.0904.EB** | BCBE | 22,0 | 28,0 | 10,0 | 32,0 | 72,0 | 0,032 – 0,060 |
| 10,0 | 9,5 | 0,3 | **MS.DD13.1004.EB** | BCBG | 22,0 | 28,0 | 10,0 | 32,0 | 72,0 | 0,040 – 0,074 |
| 11,0 | 10,5 | 0,3 | **MS.DD13.1104.EB** | BCBJ | 26,0 | 32,0 | 12,0 | 38,0 | 83,0 | 0,048 – 0,082 |
| 12,0 | 11,5 | 0,3 | **MS.DD13.1204.EB** | BCBM | 26,0 | 32,0 | 12,0 | 38,0 | 83,0 | 0,057 – 0,090 |
| 14,0 | 13,5 | 0,3 | **MS.DD13.1404.EB** | BCBP | 26,0 | 32,0 | 14,0 | 39,0 | 83,0 | 0,068 – 0,112 |
| 16,0 | 15,5 | 0,4 | **MS.DD13.1604.EB** | BCBS | 32,0 | 38,0 | 16,0 | 44,0 | 92,0 | 0,088 – 0,134 |
| 18,0 | 17,5 | 0,4 | **MS.DD13.1804.EB** | BCBU | 32,0 | 38,0 | 18,0 | 50,0 | 92,0 | 0,110 – 0,160 |
| 20,0 | 19,5 | 0,5 | **MS.DD13.2004.EB** | BCBW | 38,0 | 44,0 | 20,0 | 54,0 | 104,0 | 0,128 – 0,180 |

| | | | |
|---|---|---|---|
| **SET 1** | 4-teiliges Set \| Set of 4 pieces<br>**Ø DC 6,0 / 8,0 / 10,0 / 12,0 mm** | Bestellnummer / Order number<br>**MS.S1.DD13.EB N1 U333** | Webcode<br>**BC8D** |
| **SET 2** | 5-teiliges Set \| Set of 5 pieces<br>**Ø DC 6,0 / 8,0 / 10,0 / 12,0 / 16,0 mm** | Bestellnummer / Order number<br>**MS.S2.DD13.EB N1 U333** | Webcode<br>**BC8H** |

## Unsere Schneidstoff- und Schnittwertempfehlungen (Vc m/min) | Our cutting grade and cutting speed recommendations (Vc m/min)

Erklärung zu den Materialgruppen finden Sie auf Seite 69 | Explanations regarding the material groups can found on page 69

| Materialgruppen / Material groups | P | | | | | | H | | K | | | M | | | S | | | | N | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Schneidstoff / Cutting grade | PI | PII | PIII | PIV | PV | PVI | HI | HII | KI | KII | KIII | MI | MII | MIII | SI | SII | SIII | SIV | NI | NII | NIII | NIV | NV | NVI |
| **N1 U343** | **Schnittwertempfehlungen \| Cutting speed recommendations ØDC 3,0 – 5,0 mm** | | | | | | | | | | | | | | | | | | | | | | | |
| | 175 | 165 | 140 | 120 | 80 | 110 | 95 | - | 120 | 105 | 95 | 100 | 70 | 60 | 60 | - | 30 | - | - | - | - | - | - | - |
| **N1 U333** | **Schnittwertempfehlungen \| Cutting speed recommendations ØDC 6,0 – 20,0 mm** | | | | | | | | | | | | | | | | | | | | | | | |
| | 175 | 165 | 140 | 120 | 80 | 110 | 95 | - | 120 | 105 | 95 | 100 | 70 | 60 | 60 | - | 30 | - | - | - | - | - | - | - |

Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade
Bestellbeispiel | Order example: **MS.DD13.0304.EB N1 U343 oder BCA2 N1 U343** (N1 U343 = Schneidstoff | Grade)

# Scheibenfräser, VHM

Hochleistungs-Scheibenfräser aus VHM (vgl. DIN 885-A) für das Nutfräsen.
Auch als Satzfräser einsetzbar.

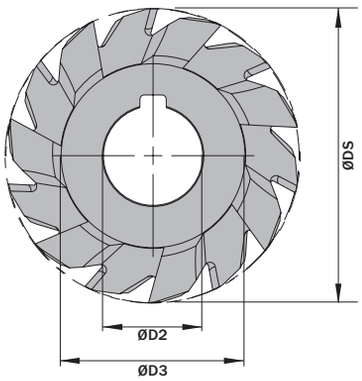
# Disc Milling Cutter, Solid Carbide

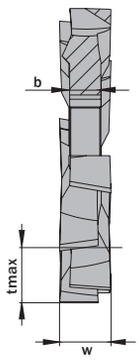
High performance solid carbide disc milling cutters (cf. DIN 885-A) for groove milling.
Can also be used as set milling cutters.

Empfehlungen | Recommendations: **ab Seite | as of Page 63**
**H01.2 · H02**

Legende | Legend: **ab Seite | as of Page 62**

VHM | DIN 885-A | un-coated



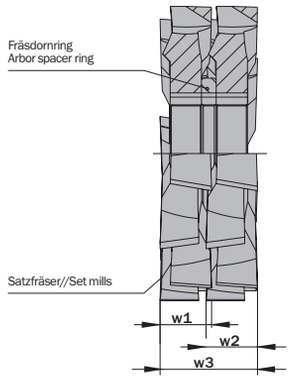




Abbildung ähnlich / Examplary image

Erläuterungen zu Kupplungsmöglichkeiten: siehe Seite 66
Explanations on coupling options: s. page 66

| ØDS ±0,1 | w k11 | ØD2 | Artikelnummer Part number | Webcode | Anzahl Schneiden Number of cutting edges | ØD3 | b ±0,1 | tmax | Vorschub fz Feed fz |
|---|---|---|---|---|---|---|---|---|---|
| mm | mm | mm | | | | mm | mm | mm | mm |
| **▼ ØDS = 40,0 mm** | | | | | | | | | |
| 40,0 | 3,0 | 13,0 | **MS.SC11.0300.RK** | A577 | 12 | 28,0 | 1,9 | 6,0 | 0,03 – 0,05 |
| 40,0 | 4,0 | 13,0 | **MS.SC11.0400.RK** | A579 | 12 | 28,0 | 2,8 | 6,0 | 0,03 – 0,05 |
| 40,0 | 5,0 | 13,0 | **MS.SC11.0500.RK** | A58B | 12 | 28,0 | 3,2 | 6,0 | 0,03 – 0,05 |
| 40,0 | 6,0 | 13,0 | **MS.SC11.0600.RK** | A58D | 12 | 28,0 | 4,2 | 6,0 | 0,03 – 0,05 |
| 40,0 | 8,0 | 13,0 | **MS.SC11.0800.RK** | A58F | 12 | 28,0 | 5,2 | 6,0 | 0,03 – 0,05 |
| 40,0 | 10,0 | 13,0 | **MS.SC11.1000.RK** | A58H | 12 | 28,0 | 7,2 | 6,0 | 0,03 – 0,05 |
| **▼ ØDS = 50,0 mm** | | | | | | | | | |
| 50,0 | 3,0 | 16,0 | **MS.SC12.0300.RK** | A58K | 14 | 34,0 | 1,9 | 8,0 | 0,03 – 0,05 |
| 50,0 | 4,0 | 16,0 | **MS.SC12.0400.RK** | A58N | 14 | 34,0 | 2,8 | 8,0 | 0,03 – 0,05 |
| 50,0 | 5,0 | 16,0 | **MS.SC12.0500.RK** | A58Q | 14 | 34,0 | 3,2 | 8,0 | 0,03 – 0,05 |
| 50,0 | 6,0 | 16,0 | **MS.SC12.0600.RK** | A58T | 14 | 34,0 | 4,2 | 8,0 | 0,03 – 0,05 |
| 50,0 | 8,0 | 16,0 | **MS.SC12.0800.RK** | A58V | 14 | 34,0 | 5,2 | 8,0 | 0,03 – 0,05 |
| 50,0 | 10,0 | 16,0 | **MS.SC12.1000.RK** | A58X | 14 | 34,0 | 7,2 | 8,0 | 0,03 – 0,05 |
| **▼ ØDS = 63,0 mm** | | | | | | | | | |
| 63,0 | 3,0 | 22,0 | **MS.SC13.0300.RK** | A58Z | 18 | 40,0 | 1,9 | 11,5 | 0,03 – 0,05 |
| 63,0 | 4,0 | 22,0 | **MS.SC13.0400.RK** | A581 | 18 | 40,0 | 2,8 | 11,5 | 0,03 – 0,05 |
| 63,0 | 5,0 | 22,0 | **MS.SC13.0500.RK** | A583 | 14 | 40,0 | 3,2 | 11,5 | 0,03 – 0,05 |
| 63,0 | 6,0 | 22,0 | **MS.SC13.0600.RK** | A585 | 14 | 40,0 | 4,2 | 11,5 | 0,03 – 0,05 |
| 63,0 | 8,0 | 22,0 | **MS.SC13.0800.RK** | A587 | 14 | 40,0 | 5,2 | 11,5 | 0,03 – 0,05 |
| 63,0 | 10,0 | 22,0 | **MS.SC13.1000.RK** | A589 | 14 | 40,0 | 7,2 | 11,5 | 0,03 – 0,05 |

## Unsere Schneidstoff- und Schnittwertempfehlungen (Vc m/min) | Our cutting grade and cutting speed recommendations (Vc m/min)

Erklärung zu den Materialgruppen finden Sie auf Seite 69 | Explanations regarding the material groups can found on page 69

| Materialgruppen Material groups | P | | | | | | H | | K | | | M | | | S | | | | N | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Schneidstoff Cutting grade | PI | PII | PIII | PIV | PV | PVI | HI | HII | KI | KII | KIII | MI | MII | MIII | SI | SII | SIII | SIV | NI | NII | NIII | NIV | NV | NVI |
| **P1 U333** | **120** | **110** | **100** | **75** | **70** | **75** | - | - | **90** | **80** | **78** | **50** | **45** | - | - | - | - | - | **300** | **300** | **280** | **280** | **200** | **200** |

Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade
Bestellbeispiel | Order example: **MS.SC11.0300.RK P1 U333 oder A577 P1 U333** (P1 U333 = Schneidstoff | Grade)

# Scheibenfräser, VHM

Hochleistungs-Scheibenfräser aus VHM (vgl. DIN 885-A) für das Nutfräsen.
Auch als Satzfräser einsetzbar.

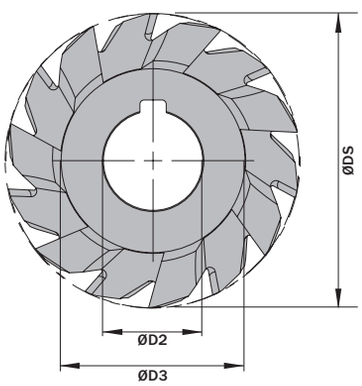
# Disc Milling Cutter, Solid Carbide

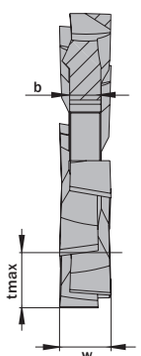
High performance solid carbide disc milling cutters (cf. DIN 885-A) for groove milling.
Can also be used as set milling cutters.

Empfehlungen | Recommendations: **ab Seite | as of Page 63**
**H01.2 · H02**

Legende | Legend: **ab Seite | as of Page 62**

VHM | DIN 885-A | un-coated



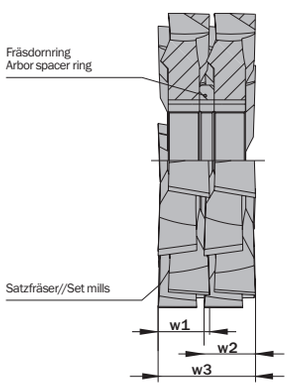




Abbildung ähnlich / Examplary image

Erläuterungen zu Kupplungsmöglichkeiten: siehe Seite 66
Explanations on coupling options: s. page 66

| ØDS ±0,1 mm | w k11 mm | ØD2 mm | Artikelnummer Part number | Webcode | Anzahl Schneiden Number of cutting edges | ØD3 mm | b ±0,1 mm | tmax mm | Vorschub fz Feed fz mm |
|---|---|---|---|---|---|---|---|---|---|
| **▼ ØDS = 80,0 mm** | | | | | | | | | |
| 80,0 | 3,0 | 27,0 | **MS.SC14.0300.RK** | A59B | 22 | 50,0 | 1,9 | 15,0 | 0,03 – 0,05 |
| 80,0 | 4,0 | 27,0 | **MS.SC14.0400.RK** | A59D | 22 | 50,0 | 2,3 | 15,0 | 0,03 – 0,05 |
| 80,0 | 5,0 | 27,0 | **MS.SC14.0500.RK** | A59F | 22 | 50,0 | 3,1 | 15,0 | 0,03 – 0,05 |
| 80,0 | 6,0 | 27,0 | **MS.SC14.0600.RK** | A59H | 18 | 50,0 | 3,5 | 15,0 | 0,03 – 0,05 |
| 80,0 | 8,0 | 27,0 | **MS.SC14.0800.RK** | A59K | 18 | 50,0 | 5,0 | 15,0 | 0,03 – 0,05 |
| 80,0 | 10,0 | 27,0 | **MS.SC14.1000.RK** | A59N | 18 | 50,0 | 7,0 | 15,0 | 0,03 – 0,05 |
| 80,0 | 12,0 | 27,0 | **MS.SC14.1200.RK** | A59Q | 14 | 50,0 | 8,0 | 15,0 | 0,03 – 0,05 |
| 80,0 | 14,0 | 27,0 | **MS.SC14.1400.RK** | A59T | 14 | 50,0 | 8,5 | 15,0 | 0,03 – 0,05 |
| **▼ ØDS = 100,0 mm** | | | | | | | | | |
| 100,0 | 4,0 | 27,0 | **MS.SC15.0400.RK** | A59V | 22 | 60,0 | 2,3 | 20,0 | 0,03 – 0,05 |
| 100,0 | 5,0 | 27,0 | **MS.SC15.0500.RK** | A59X | 22 | 60,0 | 3,1 | 20,0 | 0,03 – 0,05 |
| 100,0 | 6,0 | 27,0 | **MS.SC15.0600.RK** | A59Z | 22 | 60,0 | 3,5 | 20,0 | 0,03 – 0,05 |
| 100,0 | 8,0 | 27,0 | **MS.SC15.0800.RK** | A591 | 18 | 60,0 | 5,0 | 20,0 | 0,03 – 0,05 |
| 100,0 | 10,0 | 27,0 | **MS.SC15.1000.RK** | A593 | 18 | 60,0 | 7,0 | 20,0 | 0,03 – 0,05 |
| 100,0 | 12,0 | 27,0 | **MS.SC15.1200.RK** | A595 | 18 | 60,0 | 8,0 | 20,0 | 0,03 – 0,05 |
| 100,0 | 14,0 | 27,0 | **MS.SC15.1400.RK** | A597 | 18 | 60,0 | 9,0 | 20,0 | 0,03 – 0,05 |

## Unsere Schneidstoff- und Schnittwertempfehlungen (Vc m/min) | Our cutting grade and cutting speed recommendations (Vc m/min)

Erklärung zu den Materialgruppen finden Sie auf Seite 69 | Explanations regarding the material groups can found on page 69

| Materialgruppen / Material groups / Schneidstoff / Cutting grade | P | | | | | | H | | K | | | M | | | S | | | | N | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PI | PII | PIII | PIV | PV | PVI | HI | HII | KI | KII | KIII | MI | MII | MIII | SI | SII | SIII | SIV | NI | NII | NIII | NIV | NV | NVI |
| **P1 U333** | **120** | **110** | **100** | **75** | **70** | **75** | - | - | **90** | **80** | **78** | **50** | **45** | - | - | - | - | - | **300** | **300** | **280** | **280** | **200** | **200** |

Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade
Bestellbeispiel | Order example: **MS.SC14.0300.RK P1 U333 oder A59B P1 U333** (P1 U333 = Schneidstoff | Grade)

# Scheibenfräser, HSS

Hochleistungs-Scheibenfräser aus VHM (vgl. DIN 885-A) für das Nutfräsen.
Auch als Satzfräser einsetzbar.

# Disc Milling Cutter, HSS

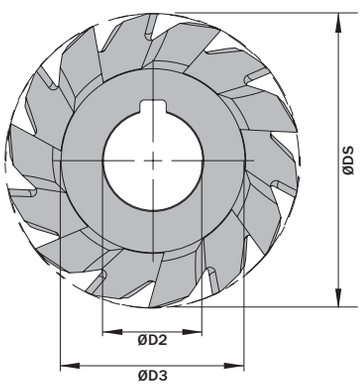
High performance solid carbide disc milling cutters (cf. DIN 885-A) for groove milling.
Can also be used as set milling cutters.

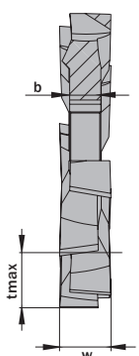
Empfehlungen | Recommendations: **ab Seite | as of Page 63**

**H01.2 · H02**

Legende | Legend: **ab Seite | as of Page 62**



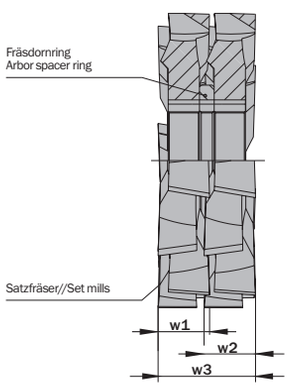




Abbildung ähnlich / Examplary image

Erläuterungen zu Kupplungsmöglichkeiten: siehe Seite 66
Explanations on coupling options: s. page 66

| ØDS ±0,1 mm | w k11 mm | ØD2 mm | Artikelnummer Part number | Webcode | Anzahl Schneiden Number of cutting edges | ØD3 mm | b ±0,1 mm | tmax mm | Vorschub fz Feed fz mm |
|---|---|---|---|---|---|---|---|---|---|
| **▼ ØDS = 63,0 mm** | | | | | | | | | |
| 63,0 | 3,0 | 22,0 | **MS.TC13.0300.RK** | A56K | 18 | 40,0 | 2,5 | 11,5 | 0,045–0,065 |
| 63,0 | 4,0 | 22,0 | **MS.TC13.0400.RK** | A56T | 18 | 40,0 | 2,8 | 11,5 | 0,045–0,065 |
| 63,0 | 5,0 | 22,0 | **MS.TC13.0500.RK** | A56V | 14 | 40,0 | 3,5 | 11,5 | 0,045–0,065 |
| 63,0 | 6,0 | 22,0 | **MS.TC13.0600.RK** | A56X | 14 | 40,0 | 4,2 | 11,5 | 0,045–0,065 |
| 63,0 | 8,0 | 22,0 | **MS.TC13.0800.RK** | A56Z | 14 | 40,0 | 5,2 | 11,5 | 0,045–0,065 |
| 63,0 | 10,0 | 22,0 | **MS.TC13.1000.RK** | A6MF | 14 | 40,0 | 7,2 | 11,5 | 0,045–0,065 |
| **▼ ØDS = 80,0 mm** | | | | | | | | | |
| 80,0 | 2,5 | 27,0 | **MS.TC14.0250.RK** | A563 | 22 | 50,0 | 1,8 | 15,0 | 0,045–0,065 |
| 80,0 | 3,0 | 27,0 | **MS.TC14.0300.RK** | A565 | 22 | 50,0 | 1,9 | 15,0 | 0,045–0,065 |
| 80,0 | 4,0 | 27,0 | **MS.TC14.0400.RK** | A567 | 22 | 50,0 | 2,3 | 15,0 | 0,045–0,065 |
| 80,0 | 5,0 | 27,0 | **MS.TC14.0500.RK** | A569 | 22 | 50,0 | 3,1 | 15,0 | 0,045–0,065 |
| 80,0 | 6,0 | 27,0 | **MS.TC14.0600.RK** | A57B | 18 | 50,0 | 3,5 | 15,0 | 0,045–0,065 |
| 80,0 | 8,0 | 27,0 | **MS.TC14.0800.RK** | A57D | 18 | 50,0 | 5,0 | 15,0 | 0,045–0,065 |
| 80,0 | 10,0 | 27,0 | **MS.TC14.1000.RK** | A57F | 18 | 50,0 | 7,0 | 15,0 | 0,045–0,065 |
| 80,0 | 12,0 | 27,0 | **MS.TC14.1200.RK** | A57H | 14 | 50,0 | 8,0 | 15,0 | 0,045–0,065 |
| 80,0 | 14,0 | 27,0 | **MS.TC14.1400.RK** | A57K | 14 | 50,0 | 8,5 | 15,0 | 0,045–0,065 |

## Unsere Schneidstoff- und Schnittwertempfehlungen (Vc m/min) | Our cutting grade and cutting speed recommendations (Vc m/min)

Erklärung zu den Materialgruppen finden Sie auf Seite 69 | Explanations regarding the material groups can found on page 69

| Materialgruppen Material groups / Schneidstoff Cutting grade | P | | | | | | H | | K | | | M | | | S | | | | N | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PI | PII | PIII | PIV | PV | PVI | HI | HII | KI | KII | KIII | MI | MII | MIII | SI | SII | SIII | SIV | NI | NII | NIII | NIV | NV | NVI |
| **00 UE00** | **120** | **110** | **100** | **75** | **70** | **75** | - | - | **90** | **80** | **78** | **50** | **45** | - | - | - | - | - | **300** | **300** | **280** | **280** | **200** | **200** |

Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade
Bestellbeispiel | Order example: **MS.TC13.0300.RK 00 UE00 oder A56K 00 UE00** (00 UE00 = Schneidstoff | Grade)

# Scheibenfräser, HSS

Hochleistungs-Scheibenfräser aus VHM (vgl. DIN 885-A) für das Nutfräsen.
Auch als Satzfräser einsetzbar.

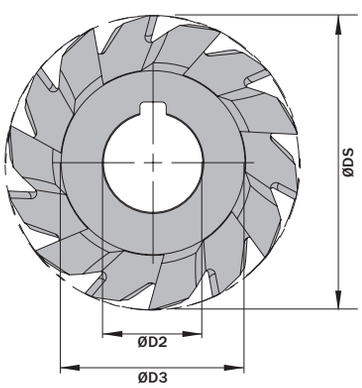
# Disc Milling Cutter, HSS

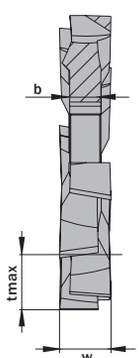
High performance solid carbide disc milling cutters (cf. DIN 885-A) for groove milling.
Can also be used as set milling cutters.

Empfehlungen | Recommendations: **ab Seite | as of Page 63**

**H01.2 · H02**

Legende | Legend: **ab Seite | as of Page 62**



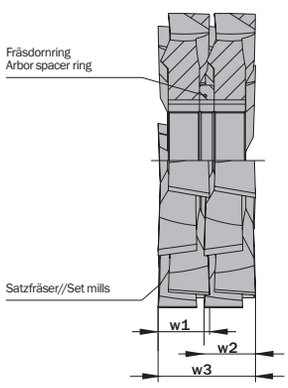




Abbildung ähnlich / Examplary image

Erläuterungen zu Kupplungsmöglichkeiten: siehe Seite 66
Explanations on coupling options: s. page 66

| ØDS ±0,1 mm | w k11 mm | ØD2 mm | Artikelnummer Part number | Webcode | Anzahl Schneiden Number of cutting edges | ØD3 mm | b ±0,1 mm | tmax mm | Vorschub fz Feed fz mm |
|---|---|---|---|---|---|---|---|---|---|
| ▼ **ØDS = 100,0 mm** | | | | | | | | | |
| 100,0 | 3,0 | 27,0 | **MS.TC15.0300.RK** | A57N | 22 | 60,0 | 1,9 | 20,0 | 0,045–0,065 |
| 100,0 | 4,0 | 27,0 | **MS.TC15.0400.RK** | A57Q | 22 | 60,0 | 2,3 | 20,0 | 0,045–0,065 |
| 100,0 | 5,0 | 27,0 | **MS.TC15.0500.RK** | A57T | 22 | 60,0 | 3,1 | 20,0 | 0,045–0,065 |
| 100,0 | 6,0 | 27,0 | **MS.TC15.0600.RK** | A57V | 22 | 60,0 | 3,5 | 20,0 | 0,045–0,065 |
| 100,0 | 8,0 | 27,0 | **MS.TC15.0800.RK** | A57X | 18 | 60,0 | 5,0 | 20,0 | 0,045–0,065 |
| 100,0 | 10,0 | 27,0 | **MS.TC15.1000.RK** | A57Z | 18 | 60,0 | 7,0 | 20,0 | 0,045–0,065 |
| 100,0 | 12,0 | 27,0 | **MS.TC15.1200.RK** | A571 | 18 | 60,0 | 8,0 | 20,0 | 0,045–0,065 |
| 100,0 | 14,0 | 27,0 | **MS.TC15.1400.RK** | A573 | 14 | 60,0 | 8,5 | 20,0 | 0,045–0,065 |
| 100,0 | 16,0 | 27,0 | **MS.TC15.1600.RK** | A575 | 14 | 60,0 | 11,0 | 20,0 | 0,045–0,065 |

## Unsere Schneidstoff- und Schnittwertempfehlungen (Vc m/min) | Our cutting grade and cutting speed recommendations (Vc m/min)

Erklärung zu den Materialgruppen finden Sie auf Seite 69 | Explanations regarding the material groups can found on page 69

| Materialgruppen Material groups / Schneidstoff Cutting grade | P | | | | | | H | | K | | | M | | | S | | | | N | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PI | PII | PIII | PIV | PV | PVI | HI | HII | KI | KII | KIII | MI | MII | MIII | SI | SII | SIII | SIV | NI | NII | NIII | NIV | NV | NVI |
| **00 UE00** | **120** | **110** | **100** | **75** | **70** | **75** | - | - | **90** | **80** | **78** | **50** | **45** | - | - | - | - | - | **300** | **300** | **280** | **280** | **200** | **200** |

Bestellnummer: Artikelnummer + Schneidstoff oder Webcode + Schneidstoff | Order number: part number + cutting grade or Webcode + cutting grade
Bestellbeispiel | Order example: **MS.TC15.0300.RK 00 UE00 oder A57N 00 UE00** (00 UE00 = Schneidstoff | Grade)

# **Legende**
# Legend

## **Werkzeugmaterialien** | Tool materials

VHM — Vollhartmetall
Solid carbide

HSS — Hochleistungsschnellarbeiterstahl
High-speed steel

## **Werkzeugkühlung** | Tool cooling


Innenkühlung
Internal cooling


Schaftkühlung
Shank cooling


Ohne Kühlung
No cooling

## **Verwendungshinweise** | Hints for usage


Pilotbohrung nicht erforderlich
Pilot bore not necessary



Pilotbohrung empfohlen
Pilot bore recommended



Als Satzfräser verwendbar
Usable as set milling cutters

universal — Universelle Einsatzmöglichkeit
Universal application possibility


Zentrumsschnitt
Center cutting

## **Werkzeugtypen** | Tool types

TYP N — Werkzeugtyp N
Tool type N

TYP NF — Typ NF mit Spanteiler
Type NF with chip breaker

FORM A — Winkelfräser Form A
Dovetail milling tool Form A

FORM B — Winkelfräser Form B
Dovetail milling tool Form B

FORM C — Winkelfräser Form C
Dovetail milling tool Form C

FORM D — Winkelfräser Form D
Dovetail milling tool Form D

## **Werkzeugeigenschaften und -maße** | Tool characterstics and dimensions



Spitzenwinkel 140°
Point angle 140°


Kreuzverzahnt
Staggered teeth

coated — Beschichte Werkzeuge
Coated tools



Werkzeugwinkel 45°
Tool angle 45°



Werkzeugwinkel 60°
Tool angle 60°

un-coated — Unbeschichte Werkzeuge
Uncoated tools


Ungleichteilung der Schneiden nequal division of cutting egdes


Freischliff am Schaft
Clearance grinding on shank


Mittellange Ausführung
Medium-length version


Gefaste Schneidenform
Chamfered cutting edge shape

## **Normen** | Standards

Norm — Werksnorm
Company standard

DIN 6888 — Scheibenfedernuten nach DIN 6888
Keyways acc. to DIN 6888

DIN 1833 — Winkelfräser nach DIN 1833
Dovetail milling tools acc. to DIN 1833

DIN 650 — T-Nuten nach DIN 650
T-slots acc. to DIN 650

DIN 850D|F — Schaftfräser nach DIN 850 D/F
End mills acc. to DIN 850 D/F

DIN 885-A — Scheibenfräser nach DIN 885-A
Disc milling cutters acc. to DIN 885-A

## **Schaftausführungen** | Tool dimensions

HA DIN 6535 — DIN 6535 HA

HB DIN 6535 — DIN 6535 HB

DIN 1835A — Aufnahme nach DIN 1835A
Shank acc. to DIN 1835A

**Schneidenanzahl/ Anzahl Führungsfasen** | Number of cutting edges / Number of guide chamfers

2 Führungsfasen
2 guide chamfers

4 Führungsfasen
4 guide chamfers

2 Schneiden
2 Cutting edges

4 Schneiden
4 Cutting edges

**Bearbeitungstiefen / nutzbare Längen** | Machining depth / usable lengths

3 x D

5 x D

8 x D

12 x D

**Toleranzen** | Tolerances

**h5** Schafttoleranz h5
Tolerance of shank h5

**h6** Schafttoleranz h6
Tolerance of shank h6

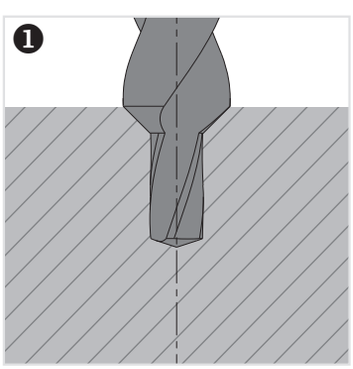
**m7** Bohrertoleranz m7
Tolerance of drill m7

## Empfehlungen
Recommendations

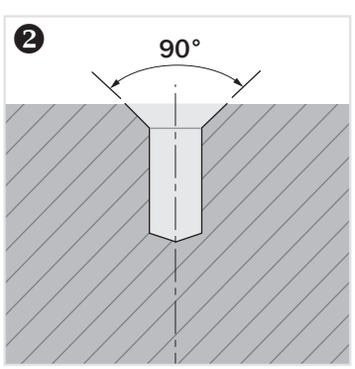
### E01
Spannung in Hydrodehn- oder Schrumpffutter empfohlen
Recommended to use with hydraulic expansion toolholder or shrink fit chuck

### E02
Gefiltertes Kühlmedium empfohlen | Use of filtered coolant medium recommended

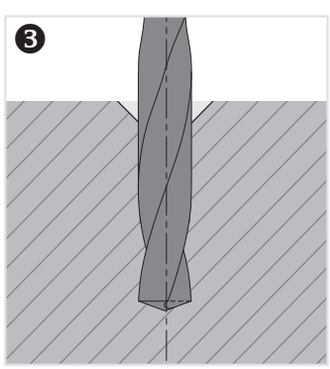
### E03
Pilotieren und Ansenken (empfohlen ab 8xD) | Pilot drilling and chamfering (recommended as of 8xD)




**Pilotieren und Ansenken mit nur einem Werkzeug.** | Pilot drilling and chamfering with just one tool.




**Entstandene Pilotbohrung zur optimalen Positionierung und Führung des nachfolgenden Bohrers.** | Resulting pilot bore for an ideal positioning and guidance of the subsequent drill.




**Tiefes Bohren ohne messbaren Übergang zur Pilotbohrung.** | Deep hole drilling without measurable transition to the pilot bore.

# Hinweisliste
Additional information

## H01: Technische Fachberatung & Lösungsmatrizen
H01: Technical support & Solution matrices

**Der erfolgreiche und prozesssichere Werkzeugeinsatz wird durch eine Vielzahl unterschiedlicher Faktoren bedingt. Um Ihnen den größtmöglichen Nutzen durch den Einsatz unserer Werkzeuge zu ermöglichen, steht Ihnen unsere technische Fachberatung gerne für alle Fragen rund um einen reibungslosen und effizienten Einsatz der Kaestner-Tools Werkzeuge zur Verfügung.** | The successful and process-reliable use of tools is determined by a variety of different aspects. In order to enable you to achieve the greatest possible benefit from the use of our tools, our technical support is available to assist with all questions regarding the successful and efficient use of our tools.

Mail: **support@kaestner.com** Tel.: **+49 7473 9517 150**

**Darüber hinaus zeigen folgende Tabellen mögliche Problemfälle während der Bearbeitung und durch welche Maßnahmen diese behoben werden können.** | In addition, the following tables show possible problems during the machining process and by which measures these can be solved.

### H01-1: Lösungsmatrix beim Bohren | Solution matrix for drilling

| **Fall** \| Case | **Lösungsmöglichkeit (siehe unten)** Solution (see below) | | | | | | |
|---|---|---|---|---|---|---|---|
| Übermäßiger Verschleiß der Querschneiden \| Excessive wear of chisel edge | 1 | 2 | 14 | | | | |
| Übermäßiger Verschleiß der Hauptschneiden \| Excessive wear of main cutting edge | 3 | 4 | 14 | 15 | | | |
| Übermäßiger Verschleiß der Spannfasen \| Excessive wear of clamping bevel | 4 | 14 | | | | | |
| Übermäßiger Verschleiß der Führungsfasen \| Excessive wear of guide chamfers | 2 | 4 | 6 | 12 | | | |
| Schneidenausbruch \| Outbreaks on cutting edge | 2 | 6 | 7 | 8 | 12 | 14 | |
| Spitzenausbruch \| Outbreak on tip | 4 | 12 | 14 | 15 | | | |
| Spänestau am Bohrerrücken \| Chip jamming on the back of the drill | 5 | 6 | 9 | 10 | 11 | 14 | 15 |
| Bruch des Werkzeugs \| Tool breakage | 2 | 6 | 9 | 12 | 14 | | |
| Ungewöhnliche Geräusche (z.B. Rattern) \| Unusual sounds (e.g. chattering) | 2 | 12 | 14 | 15 | | | |
| Spänestau \| Chip jam | 10 | 12 | 15 | 16 | | | |
| Werkstückverhärtung \| Hardening of workpiece | 12 | | | | | | |
| Unregelmäßige Genauigkeiten \| Irregular accuracies | 2 | 7 | 14 | 15 | | | |
| Gratbildung am Bohrungsausgang \| Burr formation at the bore´s exit | 6 | 13 | 14 | | | | |

### Lösungsmöglichkeit | Solution

| | | | |
|---|---|---|---|
| 1 | Freiwinkel am Bohrerzentrum > Hinterschliff \| Clearance angle at the drill´s center > back taper | 9 | Nutenbreite erweitern \| Increase groove width |
| 2 | Möglichst kurze Auskraglänge wählen \| Choose projection length as short as possible | 10 | Rückendurchmesser verringern \| Decrease diameter of drill´s back |
| 3 | Freiwinkel der äußeren Schneidkanten erhöhen \| Increase clearance angle of the outer cutting edge | 11 | Spiralwinkel verringern \| Decrease helix angle |
| 4 | Nachschliffintervall verkürzen \| Shorten reconditioning interval | 12 | Verjüngung erhöhen, Führungsfasenbreite verringern \| Increase tapering, reduce width of guide chamfer |
| 5 | Größeren Spitzenwinkel wählen \| Choose larger lead angle | 13 | Geringere Kantenverrundung wählen \| Choose smaller edge rounding |
| 6 | Max. Schneidkantenunterschied von 0,02 mm \| Max. difference of cutting edges of 0,02 mm | 14 | Vorschub verringern \| Decrease feed |
| 7 | Größere Kantenverrundung wählen \| Choose larger edge rounding | 15 | Schnittgeschwindigkeit verringern \| Decrease cutting speed |
| 8 | Kleineren Freiwinkel wählen \| Choose smaller clearance angle | 16 | Vorschub erhöhen \| Increase feed |

## **H01-2: Lösungsmatrix beim Fräsen** | Solution matrix for milling

| **Fall** \| Case | **Mögl. Ursache** Possible source | **Lösungsmöglichkeit (siehe unten)** Solution (see below) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Unzureichende Oberfläche \| Inadequate surface | ① | **1** | **4** | **6** | **8** | **9** | **11** | **17** | | | |
| Werkstückkante bröckelt aus \| Chipping of workpiece | ② | **8** | **9** | **12** | **13** | **14** | **17** | **18** | **19** | **20** | |
| Nicht parallele oder ungleichmäßige Oberfläche \| Non-parallel or uneven surface | ③ | **8** | **9** | **12** | **17** | | | | | | |
| Starker Verschleiß der Freifläche \| Strong wear of flank | ② | **1** | **7** | **11** | **12** | **17** | | | | | |
| Kolkverschleiß \| Crater wear | ② | **1** | **7** | **8** | **9** | **11** | **12** | **13** | | | |
| Thermischer Schock führt zu Bruch und Ausbrechen \| Breakage and outbreak due to thermal shock | ② | **2** | **3** | **8** | **9** | **12** | **13** | **17** | **18** | **19** | **20** |
| Aufbauschneidenbildung \| Built-up edge | ② | **4** | **5** | **7** | **11** | **12** | | | | | |
| Probleme bei der Spanabfuhr oder durch Spänestau Problems caused by chip evacuation or chip jam | ② | **5** | **7** | **8** | **10** | **11** | **12** | **15** | **16** | | |
| Vibration, Rattern \| Vibrations, chattering | ④ | **6** | **8** | **9** | **10** | **12** | **15** | **19** | **20** | | |
| Bruch des Schaftfräsers \| Breakage of end mill | ⑤ | **8** | **9** | **10** | **15** | **19** | | | | | |

### **Lösungsmöglichkeit** | Solution

| | | | |
|---|---|---|---|
| **1** | Härteren Schneidstoff verwenden \| Use harder cutting grade | **11** | Kühlschmierstoffverwendung prüfen \| Check use of coolant |
| **2** | Zäheren Schneidstoff verwenden \| Use tougher cutting grade | **12** | Größeren Freiwinkel wählen \| Larger clearance angle |
| **3** | Hitzebeständigeren Schneidstoff verwenden \| Use more heat resistant cutting grade | **13** | Größeren Keilwinkel wählen \| Larger wedge angle |
| **4** | Adhäsionsbeständigeren Schneidstoff verwenden \| Use more adhesive resistant cutting grade | **14** | Zähnezahl erhöhen \| Increase number of teeth |
| **5** | Schnittgeschwindigkeit erhöhen \| Increase cutting speed | **15** | Zähnezahl verringern \| Reduce number of teeth |
| **6** | Schnittgeschwindigkeit verringern \| Reduce cutting speed | **16** | Größere Spankammern \| Larger chip flutes |
| **7** | Vorschub erhöhen \| Increase feed | **17** | Nebenschneidenform ändern\| Change form of secondary cutting edges |
| **8** | Vorschub verringern \| Reduce feed | **18** | Rundlauf des Fräsers ändern \| Change run-out of milling tool |
| **9** | Verringerung der Schnitttiefe \| Reduce cutting depth | **19** | Steifigkeit u./o. Auskraglänge (L\|D-Verhältnis) des Fräsers ändern Change rigidity and/or projection length of milling tool |
| **10** | Ø Fräser und Schnittbreite verändern \| Change diameter of milling tool and width of cut | **20** | Leistungsfähigere Maschine mit mehr Steifigkeit verwenden Use more powerful machine with more rigidity |

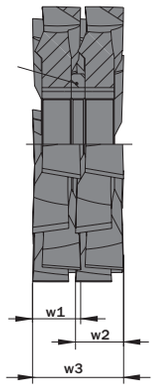
### **Mögliche Ursache** | Possible source

| | |
|---|---|
| ① | Verschleiß der Schneidkanten, unpräziser Rundlauf \| Wear of cutting edge, unprecise run-out |
| ② | Schnittbedingungen oder Form der Schneidkante ungeeignet \| Cutting conditions or contour of cutting edge inappropriate |
| ③ | Steifigkeit Fräser oder Werkstück zu gering \| Rigidity of milling tool or workpiece too low |
| ④ | Komplizierte Schnittbedingungen, Werkstückaufspannung unzureichend \| Complicated cutting conditions, clamping of workpiece |
| ⑤ | Ungeeignete Schnittbedingungen, Auskraglänge des Fräsers \| Inappropriate cutting conditions, projection length of milling tool |

## H02: Kupplungsmöglichkeiten mit Scheibenfräsern
H02: Coupling of disc milling cutters

**Zur wirtschaftlichen Herstellung von Zwischenbreiten können diese Scheibenfräser bei gleichem Durchmesser und gleicher Zähnezahl auch gekuppelt eingesetzt werden. Den folgenden Tabellen können Sie die Kupplungsmöglichkeit des jeweiligen Scheibenfräsers entnehmen, sowie welche Gesamtbreite durch entsprechendes Einstellen hergestellt werden kann.**
**Bitte beachten Sie: Für einen prozesssicheren Einsatz sollte zur Kupplung zweier Scheibenfräser stets ein geeigneter Fräsdornring verwendet werden.**

For the cost-efficient manufacturing of intermediate widths, these disc milling cutters can, when tool diameter and number of teeth are equal, also be used in a coupled way. The following tables show the coupling possibilities of the corresponding disc milling cutters as well as the total width that can be machined through according adjustment.
Please note: For a process-reliable use, a suitable milling arbor ring should always be used for coupling two disc milling cutters.




| **Scheibenfräser, VHM**<br>Disc Milling Cutter, Solid Carbide | | | **Kupplung mit 2 Fräser gleicher Breite**<br>Coupling of disc milling cutters with the same width | | | **Kupplung mit 2 Fräser unterschiedlicher Breite** \| Coupling of disc milling cutters with with different width | | |
|---|---|---|---|---|---|---|---|---|
| Artikelnummer<br>Part number | **Webcode** | Katalogseite<br>Catalog page | **w1**<br>mm | **w2**<br>mm | **w3**<br>mm | **w1**<br>mm | **w2**<br>mm | **w3**<br>mm |
| **MS.SC11.0300.RK** | A577 | **58** | 3,0 | 3,0 | 5,7 – 5,8 | 3,0 | 4,0 | 6,6 – 6,8 |
| **MS.SC11.0400.RK** | A579 | **58** | 4,0 | 4,0 | 7,7 – 7,8 | - | - | - |
| **MS.SC11.0500.RK** | A58B | **58** | 5,0 | 5,0 | 9,1 – 9,8 | 5,0 | 6,0 | 10,1 – 10,8 |
| **MS.SC11.0600.RK** | A58D | **58** | 6,0 | 6,0 | 11,1 – 11,8 | 6,0 | 8,0 | 12,6 – 13,8 |
| **MS.SC11.0800.RK** | A58F | **58** | 8,0 | 8,0 | 14,5 – 15,8 | 8,0 | 10,0 | 16,5 – 17,8 |
| **MS.SC11.1000.RK** | A58H | **58** | 10,0 | 10,0 | 18,5 – 19,8 | - | - | - |
| **MS.SC12.0300.RK** | A58K | **58** | 3,0 | 3,0 | 5,7 – 5,8 | 3,0 | 4,0 | 6,6 – 6,8 |
| **MS.SC12.0400.RK** | A58N | **58** | 4,0 | 4,0 | 7,7 – 7,8 | 4,0 | 5,0 | 8,1 – 8,8 |
| **MS.SC12.0500.RK** | A58Q | **58** | 5,0 | 5,0 | 9,1 – 9,8 | 5,0 | 6,0 | 10,1 – 10,8 |
| **MS.SC12.0600.RK** | A58T | **58** | 6,0 | 6,0 | 11,1 – 11,8 | 6,0 | 8,0 | 12,6 – 13,8 |
| **MS.SC12.0800.RK** | A58V | **58** | 8,0 | 8,0 | 14,5 – 15,8 | 8,0 | 10,0 | 16,5 – 17,8 |
| **MS.SC12.1000.RK** | A58X | **58** | 10,0 | 10,0 | 18,5 – 19,8 | - | - | - |
| **MS.SC13.0300.RK** | A58Z | **58** | 3,0 | 3,0 | 5,7 – 5,8 | 3,0 | 4,0 | 6,6 – 6,8 |
| **MS.SC13.0400.RK** | A581 | **58** | 4,0 | 4,0 | 7,7 – 7,8 | - | - | - |
| **MS.SC13.0500.RK** | A583 | **58** | 5,0 | 5,0 | 9,1 – 9,8 | 5,0 | 6,0 | 10,1 – 10,8 |
| **MS.SC13.0600.RK** | A585 | **58** | 6,0 | 6,0 | 11,1 – 11,8 | 6,0 | 8,0 | 12,6 – 13,8 |
| **MS.SC13.0800.RK** | A587 | **58** | 8,0 | 8,0 | 14,5 – 15,8 | 8,0 | 10,0 | 16,5 – 17,8 |
| **MS.SC13.1000.RK** | A589 | **58** | 10,0 | 10,0 | 18,5 – 19,8 | - | - | - |
| **MS.SC14.0300.RK** | A59B | **59** | 3,0 | 3,0 | 5,5 – 5,8 | - | - | - |
| **MS.SC14.0400.RK** | A59D | **59** | 4,0 | 4,0 | 7,3 – 7,8 | 4,0 | 5,0 | 8,1 – 8,8 |
| **MS.SC14.0500.RK** | A59F | **59** | 5,0 | 5,0 | 9,2 – 9,8 | - | - | - |
| **MS.SC14.0600.RK** | A59H | **59** | 6,0 | 6,0 | 10,7 – 11,8 | 6,0 | 8,0 | 13,0 – 13,8 |
| **MS.SC14.0800.RK** | A59K | **59** | 8,0 | 8,0 | 14,5 – 15,8 | 8,0 | 10,0 | 14,7 – 15,8 |
| **MS.SC14.1000.RK** | A59N | **59** | 10,0 | 10,0 | 18,5 – 19,8 | 10,0 | 10,0 | 16,6 – 17,8 |
| **MS.SC14.1200.RK** | A59Q | **59** | 12,0 | 12,0 | 21,6 – 23,8 | 12,0 | 14,0 | 23,5 – 25,8 |
| **MS.SC14.1400.RK** | A59T | **59** | 14,0 | 14,0 | 25,0 – 27,8 | - | - | - |
| **MS.SC15.0400.RK** | A59V | **59** | 4,0 | 4,0 | 7,3 – 7,8 | 4,0 | 5,0 | 8,1 – 8,8 |
| **MS.SC15.0500.RK** | A59X | **59** | 5,0 | 5,0 | 9,2 – 9,8 | 5,0 | 6,0 | 9,8 – 10,8 |
| **MS.SC15.0600.RK** | A59Z | **59** | 6,0 | 6,0 | 10,6 – 11,8 | - | - | - |
| **MS.SC15.0800.RK** | A591 | **59** | 8,0 | 8,0 | 14,5 – 15,8 | 8,0 | 10,0 | 16,6 – 17,8 |
| **MS.SC15.1000.RK** | A593 | **59** | 10,0 | 10,0 | 18,8 – 19,8 | 10,0 | 12,0 | 18,3 – 19,8 |
| **MS.SC15.1200.RK** | A595 | **59** | 12,0 | 12,0 | 21,8 – 23,8 | 12,0 | 14,0 | 22,0 – 23,8 |
| **MS.SC15.1400.RK** | A597 | **59** | 14,0 | 14,0 | 25,5 – 27,8 | 14,0 | 14,0 | 23,7 – 25,8 |

**Scheibenfräser, HSS**
Disc Milling Cutter, HSS

| Artikelnummer<br>Part number | Webcode | Katalogseite<br>Catalog page | **Kupplung mit 2 Fräser gleicher Breite**<br>Coupling of disc milling cutters with the same width | | | **Kupplung mit 2 Fräser unterschiedlicher Breite** \| Coupling of disc milling cutters with with different width | | |
|---|---|---|---|---|---|---|---|---|
| | | | **w1** | **w2** | **w3** | **w1** | **w2** | **w3** |
| | | | mm | mm | mm | mm | mm | mm |
| **MS.TC13.0300.RK** | A56K | 60 | 3,0 | 3 | 5,7 – 5,8 | 3,0 | 4,0 | 6,6 – 6,8 |
| **MS.TC13.0400.RK** | A56T | 60 | 4,0 | 4 | 7,7 – 7,8 | - | - | - |
| **MS.TC13.0500.RK** | A56V | 60 | 5,0 | 5 | 9,1 – 9,8 | 5,0 | 6,0 | 9,6 – 10,8 |
| **MS.TC13.0600.RK** | A56X | 60 | 6,0 | 6 | 11,1 – 11,8 | 6,0 | 8,0 | 12,6 – 13,8 |
| **MS.TC13.0800.RK** | A56Z | 60 | 8,0 | 8 | 14,5 – 15,8 | 8,0 | 10,0 | 16,5 – 17,8 |
| **MS.TC13.1000.RK** | A6MF | 60 | 10,0 | 10 | 18,5 – 19,8 | - | - | - |
| **MS.TC14.0250.RK** | A563 | 60 | 2,5 | 2,5 | 4,5 – 4,8 | - | - | - |
| **MS.TC14.0300.RK** | A565 | 60 | 3,0 | 3 | 5,5 – 5,8 | 3,0 | 4,0 | 6,6 – 6,8 |
| **MS.TC14.0400.RK** | A567 | 60 | 4,0 | 4 | 7,3 – 7,8 | 4,0 | 5,0 | 8,1 – 8,8 |
| **MS.TC14.0500.RK** | A569 | 60 | 5,0 | 5 | 9,2 – 9,8 | - | - | - |
| **MS.TC14.0600.RK** | A57B | 60 | 6,0 | 6,0 | 10,7 – 11,8 | 6,0 | 8,0 | 13,0 – 13,8 |
| **MS.TC14.0800.RK** | A57D | 60 | 8,0 | 8,0 | 14,5 – 15,8 | 6,0 | 10,0 | 14,7 – 15,8 |
| **MS.TC14.1000.RK** | A57F | 60 | 10,0 | 10,0 | 18,5 – 19,8 | 8,0 | 10,0 | 16,6 – 17,8 |
| **MS.TC14.1200.RK** | A57H | 60 | 12,0 | 12,0 | 22,6 – 23,8 | 12,0 | 14,0 | 23,5 – 25,8 |
| **MS.TC14.1400.RK** | A57K | 60 | 14,0 | 14,0 | 25,0 – 27,8 | 14,0 | 16,0 | 27,5 – 29,8 |
| **MS.TC15.0300.RK** | A57N | 61 | 3,0 | 3,0 | 5,7 – 7,8 | - | - | - |
| **MS.TC15.0400.RK** | A57Q | 61 | 4,0 | 4,0 | 7,3 – 7,8 | 4,0 | 5,0 | 8,1 – 8,8 |
| **MS.TC15.0500.RK** | A57T | 61 | 5,0 | 5,0 | 9,2 – 9,8 | 5,0 | 6,0 | 9,8 – 10,8 |
| **MS.TC15.0600.RK** | A57V | 61 | 6,0 | 6,0 | 10,6 – 11,8 | - | - | - |
| **MS.TC15.0800.RK** | A57X | 61 | 8,0 | 8,0 | 14,5 – 15,8 | 8,0 | 10,0 | 16,6 – 17,8 |
| **MS.TC15.1000.RK** | A57Z | 61 | 10,0 | 10,0 | 18,8 – 19,8 | 8,0 | 12,0 | 18,3 – 19,8 |
| **MS.TC15.1200.RK** | A571 | 61 | 12,0 | 12,0 | 21,8 – 23,8 | - | - | - |
| **MS.TC15.1400.RK** | A573 | 61 | 14,0 | 14,0 | 25,5 – 27,8 | - | - | - |
| **MS.TC15.1600.RK** | A575 | 61 | 16,0 | 16,0 | 29,5 – 31,8 | - | - | - |

# Formelverzeichnis
Formula index

| Geschwindigkeit, Vorschub \| Speed, Feed | | |
|---|---|---|
| Drehzahl \| Spindle speed | $n = \frac{V_c \cdot 1000}{D \cdot \pi}$ | **D** Durchmesser \| Diameter [mm]<br>**f** Vorschub \| Feed [mm\|U]<br>**$f_z$** Zahnvorschub \| Feed per tooth [mm\|Z]<br>**n** Drehzahl \| Spindle speed [U\|min]<br>**$v_c$** Schnittgeschwindigkeit \| Cutting speed [m\|min]<br>**$v_f$** Vorschubgeschwindigkeit \| Feed rate [mm\|min]<br>**z** Anzahl der Schneiden \| Number of cutting teeth<br>$\pi$ 3,14159... |
| Schnittgeschwindigkeit \| Cutting speed | $V_c = \frac{D \cdot \pi \cdot n}{1000}$ | |
| Vorschub pro Zahn \| Feed per tooth | $f_z = \frac{f}{z} = \frac{V_f}{z \cdot n}$ | |
| Vorschub pro Umdrehung \| Feed per revolution | $f = f_z \cdot z$ | |
| Vorschubgeschwindigkeit \| Feed rate | $v_f = f_z \cdot z \cdot n$ | |

# **Materialgruppen**
Material groups

| **ISO-Gruppe** ISO-Group | **Untergruppe** Sub group | **Beschreibung** Description | **Inhalt** Content | **Zugfestigkeit RM (MPa)*** Tensile strength RM (MPa)* | **Härte (HB)** Hardness (HB) | **Härte (HRC)** Hardness(HRC) | **Gängige Werkstoffe** Common materials |
|---|---|---|---|---|---|---|---|
| P | PI | Kohlenstoffarme Stähle, kurzspanend, leicht zerspanbar<br>*Low-Carbon Steels, Short Chipping, Free Machining* | C <0,25% | <600 | <125 | - | C15, Ck22, ST37-2, S235JR, 9SMnPb28, GS38 |
| | PII | Stähle mit mittlerem und hohem Kohlenstoffgehalt<br>*Medium-and High-Carbon Steels* | C >0,25% | >600 | <220 | <25 | ST52, S355JR, C35, GS60, Cf53 |
| | PIII | Legierte Stähle und Werkzeugstähle<br>*Alloy Steels and Tool Steels* | C >0,25% | 600-1000 | <330 | <35 | 16MnCr5, CK45, 21CrMoV5-7, 38SMn28 |
| | PIV | Legierte Stähle und Werkzeugstähle<br>*Alloy Steels and Tool Steels* | C >0,25% | 1000-1400 | 340-450 | 35-48 | 100Cr6, 30CrNiMo8, 42CrMo4QT, C702, S6525, X120Mn12 |
| | PV | Ferritische, martensitische und nicht rostende PH-Stähle<br>*Ferritic, Martensitic, and PH Stainless Steels* | - | 600-900 | <330 | <35 | 100Cr6, 30CrNiMo8, S6525, X120Mn12 |
| | PVI | Hochfeste ferritische, martensitische und PH-Edelstähle<br>*High-Strength Ferritic, Martensitic, and PH Stainless Steels* | - | 900-1350 | 350-450 | 35-48 | X102CrMo17, G-X120Cr29 |
| H | HI | Gehärtete Werkstoffe<br>*Hardened Materials* | - | 1250<br>(45HRC) | - | 45-55 | GX260NiCr42, GX330NiCr42, GX300CrNiSi952, GX300CrMo153, Toolox[1], Hartguss \| Hard cast iron |
| | HII | Gehärtete Werkstoffe<br>*Hardened Materials* | - | - | - | 55-67 | Gehärtetes Gusseisen \| Hardened Ductile Iron<br>Gehärteter Stahl \| Hardened Steel<br>HSS, Hardox[2] |
| K | KI | Grauguss<br>*Grey Cast Iron* | - | 125-500 | 120-290 | <32 | GG15, GG25, GG30, GG40 |
| | KII | Duktiles Gusseisen (Sphäroguss) mit niedriger bis mittlerer Festigkeit und Vermikularguss<br>*Low-and Medium-Strength Ductile Irons (Nodular Irons) and Compacted Graphite Irons (CGI)* | - | <600 | 130-260 | <28 | GGG40, GTS35,<br>GJV-450, GJV-300 |
| | KIII | Hochfeste Gusseisen und bainitisches Gusseisen mit Kugelgraphit (ADI)<br>*High-Strength Ductile Irons and Austempered Ductile Iron (ADI)* | - | >600 | 180-350 | <43 | GGG60, GTW55, GTS65 |
| M | MI | Austenitischer nicht rostender Stahl<br>*Austenitic Stainless Steel* | - | <600 | 130-200 | - | X5CrNi 18 10, X2CrNiMo 17 13 2, G-X25CrNiSi18 9, X15CrNiSi 20 12 |
| | MII | Hochfeste austenitische, nicht rostende Stähle und Edelstahlguss<br>*High-Strength Austenitic Stainless and Cast Stainless Steels* | - | 600-800 | 150-230 | <25 | X2CrNiMo 13 4, X5NiCr 32 21, X5CrNiNb 18 10, G-X15CrNi 25-20 |
| | MIII | Duplex-Edelstahl, austenitischer, ferritischer nicht rostender Stahl<br>*Duplex Stainless Steel, Austenitic Stainless and Cast Stainless Steels* | - | <800 | 135-275 | <30 | X8CrNiMo27 5, X2CrNiMoN22 5 3, X20CrNiSi25 4, G-X40CrNiSi27 4 |

# Materialgruppen
Material groups

| **ISO-Gruppe** ISO-Group | **Untergruppe** Sub group | **Beschreibung** Description | **Inhalt** Content | **Zugfestigkeit RM (MPa)*** Tensile strength RM (MPa)* | **Härte (HB)** Hardness (HB) | **Härte (HRC)** Hardness(HRC) | **Gängige Werkstoffe** Common materials |
|---|---|---|---|---|---|---|---|
| S | SI | Warmfeste Legierungen auf Eisenbasis<br>Iron-Based, Heat-Resistant Alloys | - | 500-1200 | 160-260 | 25-48 | X1NiCrMoCu32 28 7, X12NiCrSi36 16, X5NiCrAlTi31 20, X40CoCrNi20 20 |
| | SII | Warmfeste Legierungen auf Kobaltbasis<br>Cobalt-Based, Heat-Resistant Alloys | - | 1000-1450 | 250-450 | 25-48 | Stellite[3], Haynes[4] |
| | SIII | Warmfeste Legierungen auf Nickelbasis<br>Nickel-Based, Heat-Resistant Alloys | - | 600-1700 | 160-450 | <48 | Hastelloy[5], NIMONIC[6], INCONEL[7], Monel[8]400 |
| | SIV | Titan und Titanlegierungen<br>Titanium and Titanium Alloys | - | 900-1600 | 300-400 | 33-48 | Ti1, TiAl5Sn2, TiAl6V4, TiAl4Mo4Sn2 |
| N | NI | Aluminium-Knetlegierungen<br>Wrought Aluminium | - | - | - | - | AlMg1, Al99.5, AlCuMg1, AlCuBiPb, AlMgSi1, ALMgSiPb |
| | NII | Aluminiumlegierungen mit geringem Siliziumgehalt und Magnesiumlegierungen<br>Low-Silicon Aluminium Alloys and Magnesium Alloys | Si <12,2% | - | - | - | GAlSiCu4, GDAlSi10Mg, G-AlSi10Mg, G-ALCu5Ni1,5 |
| | NIII | Aluminiumlegierungen mit hohem Siliziumgehalt<br>High-Silicon Aluminium Alloys and Magnesium Alloys | Si >12,2% | - | - | - | G-AlSi12, G-AlSi17Cu4, G-AlSi21CuNiMg |
| | NIV | Kupfer, Messing, Zink-Basislegierungen, Bronze<br>Copper, Brass, Zinc-Based alloys, Bronze | - | - | - | - | CuZn40, Ms60, G-CuSn5ZnPb, CuZn37, CuSi3Mn |
| | NV | Nylon, Kunststoffe, Gummi, Phenole<br>Nylon, Plastics, Rubbers, Phenolics, Resins | - | - | - | - | PMMA, PEEK, AFK, POM, PC, PP, PS, PVC |
| | NVI | Kohlefaser-und Graphit-Verbundwerkstoffe, Glasfaser<br>Carbon, Graphite Composites, Fibreglass | < 80%<br>Glas-/Kohlefaser<br>Glass/Carbon fibre | - | - | - | PAC6, PVDF, PTFE, PEEKGF30, CFK,GFK |

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[3] Stellite ist ein eingetragenes Warenzeichen von Kennametal, Inc. | Stellite is a trademark of Kennametal, Inc.

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