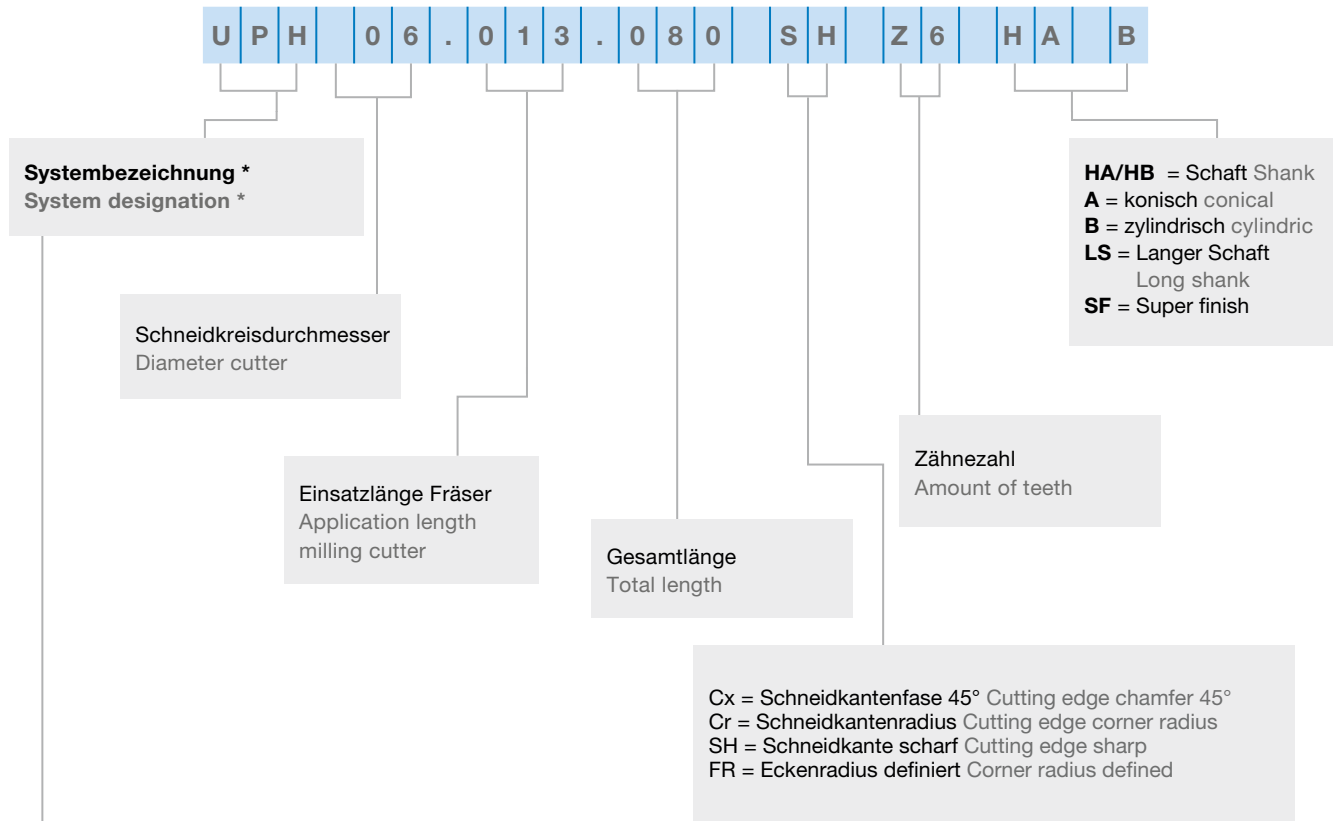


Fräserbezeichnung für Vollhartmetallfräser
Cutter designation system for solid carbide milling tools



*** Systembezeichnung**
*** System designation**

| | |
|--------------------------|----------------------------------|
| U.. Unitec | BCU Balltec SC Universal |
| UN Unitec N | BCH Balltec SC Hardened |
| UC Unitec Chamfer | BCN Balltec SC N |
| UP. Unitec Pro | BCG Balltec SC Graphite |
| UPN Unitec Pro N | |
| UPH Unitec Pro H | TCU Torrotec SC Universal |
| | TCH Torrotec SC Hardened |
| MU Multitec | |
| MUN Multitec N | FCU Feedtec SC Universal |
| | FCH Feedtec SC Hardened |
| T Trochotec | |
| TP Trochotec PM | |
| TS Trochotec S | |
| TT Trochotec T | |
| TH Trochotec TH | |

Symbolerklärung für Fräsoperationen
Symbols for milling operations

| | | | |
|---|--|------------------------------------|--|
| Planfräsen Face milling | | Tauchfräsen Plunge milling | |
| Gassenfräsen Pocket milling | | Zirkularfräsen Helical ramping | |
| Eckfräsen Edge milling | | Taschenfräsen Pocketing | |
| Nutfräsen Slot milling | | Rampe eintauchen Linear ramping | |
| Besäumen Trimming | | Kopierfräsen Copy milling | |
| Trochodiales Fräsen Trochoidal milling | | Fasen Chamfering | |

Symbolerklärung für Fräsoperationen Vollhartmetallfräser
Symbols for milling operations solid carbide milling tools

| | | | |
|---|------------|---|--|
| Schutzfase 45° Chamfer 45° | Cx | Standard Linie Standard line | |
| Schutzradius nicht genormt Radius not standardized | Cr | Professional Linie Professional line | |
| Scharfe Schneide Sharp edge | SH | Schaftausführung Shank type | |
| Radius definiert Radius standardized | FR | Ungleichteilung Unequal division | |
| Ausführung 2xD Execution 2xD | 2xD | Ungleiche Drillwinkel Unequal helix angle | |
| Ausführung 3xD Execution 3xD | 3xD | Eintauchwinkel Ramping angle | |
| Ausführung 5xD Execution 5xD | 5xD | Toleranzklassifizierung Tolerance classification | |

boehlerit

Vollhartmetall
Fräswerkzeuge
Solid carbide milling tools



Allgemeine Anwendungen General machining



Fräswerkzeuge für Vollnuten und den allgemeinen Anwendungsfall
End milling cutters for full slots and general machining application

Ø 1 - 25 mm Ø 1 - 25 mm

Standard und Professional Linie Standard and Professional line

Verschiedene Ausführungen erhältlich Many executions available

Hohe Standzeiten High tool life

Optimaler Späneabtransport Optimized chip transportation

Seite 208 Page 208

Eckfräsen Schruppen Edge milling roughing



Fräswerkzeuge für hohe Zerspanungsvolumina beim Schruppen
End milling cutters for high removal rates on roughing

Ø 4 - 25 mm Ø 4 - 25 mm

Professional Linie Professional line

Kurze und lange Ausführungen erhältlich

Short and long executions available

Spezielle HPC- Schruppverzahnung Special HPC- geometry

Ungleichteilung gegen Vibrationen

Unequal division against vibrations

Seite 240 Page 240

Eckfräsen Schlichten Edge milling finishing



Fräswerkzeuge für höchste Oberflächengüten
End milling cutters for excellent surface qualities

Ø 4 - 25 mm Ø 4 - 25 mm

Standard und Professional Linie Standard and professional line

Auch für harte Werkstoffe erhältlich Also for hardened materials

Optimierte Zahnanzahl Optimized teeth amount

Verschiedene Schneidkantenausführungen erhältlich

Different edge executions available

Seite 248 Page 248

Trochoidal Fräsen Trochoidal milling



Fräswerkzeuge für höchste Zerspanungsraten bei hohen Oberflächengüten
End milling cutters for highest removal rates paired with high surface qualities

Ø 4 - 25 mm Ø 4 - 25 mm
Professional Linie Professional line
Ungleichteilung Unequal division
Gewuchtet nach DIN ISO 1940-G2.5 Heaved acc. DIN ISO 1940-G2.5
Hohe Schnitttiefen möglich High depth of cuts possible

Seite 258 Page 258

3D Fräsen 3D Milling



Fräswerkzeuge für den Gesenk- und Formenbau
End milling cutters for mould and die

Ø 0,4 - 20 mm Ø 0,4 - 20 mm
Für weiche und harte Werkstoffe For soft and hardened materials
Professional Linie Professional line
Hohe Rundlaufgenauigkeiten High concentricity
Sehr hohe Laufruhe Excellent running behaviour
Hochvorschubfräser High feed cutters

Seite 268 Page 268

Fasbearbeitung, Entgraten Chamfering, deburring



Fräswerkzeuge für Fasbearbeitung
End milling cutters for chamfering




Ø 4 - 20 mm Ø 4 - 20 mm
Standard Linie Standard line
Entgraten und Senken 90° Chamfering and spotting 90°

Seite 310 Page 310

boehlerit

Allgemeine Anwendungen
und Nutfräsen
General machining
and slot milling

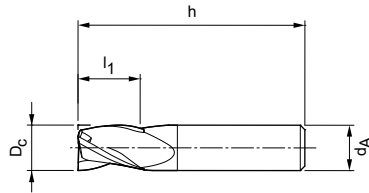


| Allgemeine Anwendungen General machining | | | |
|---|---|--|---|
| | UNIttec | UNIttec Pro | MULTIttec |
| |  |  |  |
| Zähnezahl Amount teeth | Z2, Z3, Z4 | Z3, Z4, Z5 | Z3 |
| P.1 | ■ | ■ | ■ |
| P.2 | ■ | ■ | ■ |
| P.3 | ■ | ■ | ■ |
| P.4 | ■ | ■ | ■ |
| P.5 | ■ | ■ | ■ |
| P.6 | ■ | ■ | ■ |
| M.1 | ■ | ■ | ■ |
| M.2 | ■ | ■ | ■ |
| K.1 | ■ | ■ | ■ |
| K.2 | ■ | ■ | ■ |
| K.3 | □ | ■ | ■ |
| N.1 | ■ | ■ | ■ |
| N.2 | ■ | ■ | ■ |
| N.3 | ■ | ■ | ■ |
| N.4 | □ | □ | □ |

UNIttec short

Kurze Ausführung Z3

Execution short Z3



| Hard Facts | |
|--------------------|-----------------|
| Fräserdurchmesser: | 2,50 - 16,00 mm |
| Beschichtung: | TiAlN PVD |
| Schneidenzahl: | Z = 3 |
| Drallwinkel: | 30° |
| Diameter: | 2.50 - 16.00 mm |
| Coating: | TiAlN PVD |
| Amount/Teeth: | Z = 3 |
| Helix angle: | 30° |

| UNIttec short | | |
|---------------|-----|---|
| ISO | | |
| P | P.1 | ■ |
| | P.2 | ■ |
| | P.3 | ■ |
| | P.4 | ■ |
| | P.5 | ■ |
| M | M.1 | □ |
| | M.2 | □ |
| K | K.1 | ■ |
| | K.2 | ■ |
| | K.3 | □ |
| N | N.1 | ■ |
| | N.2 | ■ |
| | N.3 | □ |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|-------|----------------|---|-----------------|
| | | | D _C | d _A | h | l ₁ | | |
| U02.5.004.040 SH Z3 HA | 5162703 | ● | 2,50 | 6,00 | 40,00 | 4,00 | 3 | HA |
| U03.005.040 SH Z3 HA | 5162728 | ● | 3,00 | 6,00 | 40,00 | 5,00 | 3 | HA |
| U03.5.005.040 SH Z3 HA | 5162730 | ● | 3,50 | 6,00 | 40,00 | 5,00 | 3 | HA |
| U04.007.040 SH Z3 HA | 5162731 | ● | 4,00 | 6,00 | 40,00 | 7,00 | 3 | HA |
| U04.5.007.040 SH Z3 HA | 5162733 | ● | 4,50 | 6,00 | 40,00 | 7,00 | 3 | HA |
| U05.008.040 SH Z3 HA | 5162736 | ● | 5,00 | 6,00 | 40,00 | 8,00 | 3 | HA |
| U05.5.008.040 SH Z3 HA | 5162738 | ● | 5,50 | 6,00 | 40,00 | 8,00 | 3 | HA |
| U05.75.008.040 SH Z3 HA | 5162740 | ○ | *5,75 | 6,00 | 40,00 | 8,00 | 3 | HA |
| U06.008.040 SH Z3 HA | 5162742 | ● | 6,00 | 6,00 | 40,00 | 8,00 | 3 | HA |
| U06.75.011.043 SH Z3 HA | 5162744 | ○ | *6,75 | 8,00 | 43,00 | 11,00 | 3 | HA |
| U07.011.043 SH Z3 HA | 5162746 | ● | 7,00 | 8,00 | 43,00 | 11,00 | 3 | HA |
| U07.75.011.043 SH Z3 HA | 5162747 | ● | *7,75 | 8,00 | 43,00 | 11,00 | 3 | HA |
| U08.011.043 SH Z3 HA | 5162748 | ● | 8,00 | 8,00 | 43,00 | 11,00 | 3 | HA |
| U08.7.013.050 SH Z3 HA | 5162749 | ○ | 8,70 | 10,00 | 50,00 | 13,00 | 3 | HA |
| U09.013.050 SH Z3 HA | 5162750 | ○ | 9,00 | 10,00 | 50,00 | 13,00 | 3 | HA |
| U09.7.013.050 SH Z3 HA | 5162752 | ○ | *9,70 | 10,00 | 50,00 | 13,00 | 3 | HA |
| U10.013.050 SH Z3 HA | 5162754 | ● | 10,00 | 10,00 | 50,00 | 13,00 | 3 | HA |
| U12.015.055 SH Z3 HA | 5162755 | ● | 12,00 | 12,00 | 55,00 | 15,00 | 3 | HA |
| U14.015.058 SH Z3 HA | 5162756 | ○ | 14,00 | 14,00 | 58,00 | 15,00 | 3 | HA |
| U16.018.062 SH Z3 HA | 5162758 | ● | 16,00 | 16,00 | 62,00 | 18,00 | 3 | HA |

Bestellbeispiel Order example: 1 Stück piece 5162703 oder or U02.5.004.040 SH Z3 HA

Genaue Schnittwertempfehlung siehe Seite 230

Detailed cutting recommendations, see page 230

* Untermaßgrößen speziell zum Passnutfräsen

* Untermaßgrößen speziell zum Passnutfräsen

● Verfügbar ab Lager Available from stock

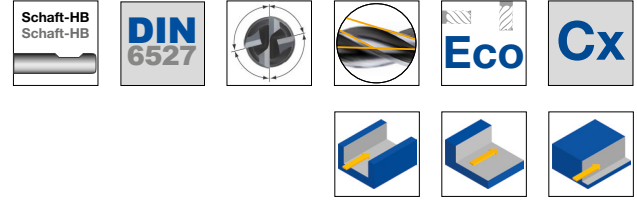
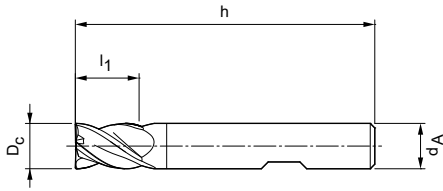
● Kurzfristig lieferbar Shortly available

○ Lieferzeit auf Anfrage Delivery time on request

UNitec short

Kurze Ausführung Z4

Execution short Z4



| Hard Facts | |
|--------------------|------------------|
| Fräserdurchmesser: | 3,00 - 20,00 mm |
| Beschichtung: | AlTiN PVD |
| Schneidenzahl: | Z = 4 |
| Drallwinkel: | 36° / 38,5° |
| Besonderheiten: | Ungleichteilung |
| | |
| Diameter: | 3.00 - 20.00 mm |
| Coating: | AlTiN PVD |
| Amount/Teeth: | Z = 4 |
| Helix angle: | 36° / 38,5° |
| Special feature: | Unequal division |

| UNitec short | | |
|--------------|-----|---|
| ISO | | |
| P | P.1 | ■ |
| | P.2 | ■ |
| | P.3 | ■ |
| | P.4 | ■ |
| | P.5 | ■ |
| M | M.1 | ■ |
| | M.2 | ■ |
| K | K.1 | ■ |
| | K.2 | ■ |
| | K.3 | □ |

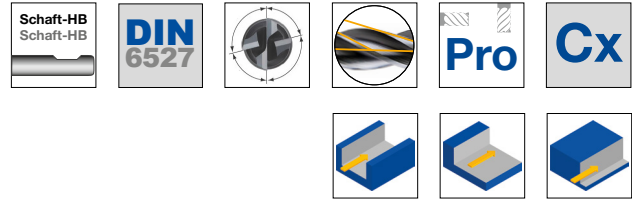
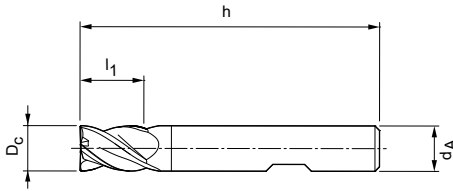
| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|-------|----------------|--------|---|-----------------|
| | | | D _c | d _A | h | l ₁ | Cx 45° | | |
| U03.006.050 Cx Z4 HB | 5162762 | ● | 3,00 | 6,00 | 50,00 | 6,00 | 0,06 | 4 | HB |
| U04.008.054 Cx Z4 HB | 5162763 | ● | 4,00 | 6,00 | 54,00 | 8,00 | 0,08 | 4 | HB |
| U05.009.054 Cx Z4 HB | 5162765 | ● | 5,00 | 6,00 | 54,00 | 9,00 | 0,10 | 4 | HB |
| U06.010.054 Cx Z4 HB | 5162766 | ● | 6,00 | 6,00 | 54,00 | 10,00 | 0,12 | 4 | HB |
| U08.012.058 Cx Z4 HB | 5162769 | ● | 8,00 | 8,00 | 58,00 | 12,00 | 0,16 | 4 | HB |
| U10.014.066 Cx Z4 HB | 5162770 | ● | 10,00 | 10,00 | 66,00 | 14,00 | 0,20 | 4 | HB |
| U12.016.073 Cx Z4 HB | 5162771 | ● | 12,00 | 12,00 | 73,00 | 16,00 | 0,24 | 4 | HB |
| U14.016.073 Cx Z4 HB | 5162772 | ○ | 14,00 | 14,00 | 73,00 | 16,00 | 0,28 | 4 | HB |
| U16.022.082 Cx Z4 HB | 5162777 | ● | 16,00 | 16,00 | 82,00 | 22,00 | 0,32 | 4 | HB |
| U18.022.082 Cx Z4 HB | 5162780 | ○ | 18,00 | 18,00 | 82,00 | 22,00 | 0,36 | 4 | HB |
| U20.026.092 Cx Z4 HB | 5162784 | ○ | 20,00 | 20,00 | 92,00 | 26,00 | 0,40 | 4 | HB |

Bestellbeispiel Order example: 1 Stück piece 5162762 oder or U03.006.050 Cx Z4 HB
 Genaue Schnittwertempfehlung siehe Seite 230
 Detailed cutting recommendations, see page 230

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

UNItec Pro short

Kurze Ausführung Z4
Execution short Z4



| Hard Facts | |
|--------------------|------------------|
| Fräserdurchmesser: | 3,00 - 20,00 mm |
| Beschichtung: | AlCrN PVD |
| Schneidenzahl: | Z = 4 |
| Drallwinkel: | 36° / 38° |
| Besonderheiten: | Ungleichteilung |
| | |
| Diameter: | 3.00 - 20.00 mm |
| Coating: | AlCrN PVD |
| Amount/Teeth: | Z = 4 |
| Helix angle: | 36° / 38° |
| Special feature: | Unequal division |

| UNItec Pro short | | |
|------------------|-----|---|
| ISO | | |
| P | P.1 | ■ |
| | P.2 | ■ |
| | P.3 | ■ |
| | P.4 | ■ |
| | P.5 | ■ |
| M | M.1 | ■ |
| | M.2 | ■ |
| K | K.1 | ■ |
| | K.2 | ■ |
| | K.3 | ■ |

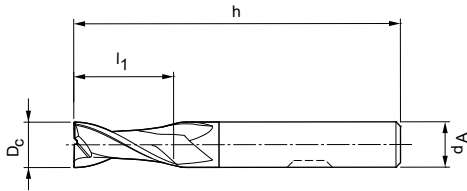
| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|-------|----------------|--------|---|-----------------|
| | | | D _C | d _A | h | l ₁ | Cx 45° | | |
| UP03.006.050 Cx Z4 HB | ● | 5162941 | 3,00 | 6,00 | 50,00 | 6,00 | 0,06 | 4 | HB |
| UP04.008.054 Cx Z4 HB | ● | 5162944 | 4,00 | 6,00 | 54,00 | 8,00 | 0,08 | 4 | HB |
| UP05.009.054 Cx Z4 HB | ● | 5162945 | 5,00 | 6,00 | 54,00 | 9,00 | 0,10 | 4 | HB |
| UP06.010.054 Cx Z4 HB | ● | 5162947 | 6,00 | 6,00 | 54,00 | 10,00 | 0,12 | 4 | HB |
| UP08.012.058 Cx Z4 HB | ● | 5162948 | 8,00 | 8,00 | 58,00 | 12,00 | 0,16 | 4 | HB |
| UP10.014.066 Cx Z4 HB | ● | 5162949 | 10,00 | 10,00 | 66,00 | 14,00 | 0,20 | 4 | HB |
| UP12.016.073 Cx Z4 HB | ● | 5162954 | 12,00 | 12,00 | 73,00 | 16,00 | 0,24 | 4 | HB |
| UP14.016.073 Cx Z4 HB | ⦿ | 5163145 | 14,00 | 14,00 | 73,00 | 16,00 | 0,28 | 4 | HB |
| UP16.022.082 Cx Z4 HB | ● | 5162958 | 16,00 | 16,00 | 82,00 | 22,00 | 0,32 | 4 | HB |
| UP18.022.082 Cx Z4 HB | ⦿ | 5163146 | 18,00 | 18,00 | 82,00 | 22,00 | 0,36 | 4 | HB |
| UP20.026.092 Cx Z4 HB | ⦿ | 5163147 | 20,00 | 20,00 | 92,00 | 26,00 | 0,40 | 4 | HB |

Bestellbeispiel Order example: 1 Stück piece 5162941 oder or UP03.006.050 Cx Z4 HB
 Genaue Schnittwertempfehlung siehe Seite 232
 Detailed cutting recommendations, see page 232

- Verfügbar ab Lager Available from stock
- ⦿ Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

UNItec long

Lange Ausführung Z2
Execution long Z2



| Hard Facts | |
|--------------------|-----------------|
| Fräserdurchmesser: | 1,00 - 20,00 mm |
| Beschichtung: | TiAlN PVD |
| Schneidenzahl: | Z = 2 |
| Drallwinkel: | 30° |
| Diameter: | 1.00 - 20.00 mm |
| Coating: | TiAlN PVD |
| Amount/Teeth: | Z = 2 |
| Helix angle: | 30° |

| UNItec long | | |
|-------------|-----|---|
| ISO | | |
| P | P.1 | ■ |
| | P.2 | ■ |
| | P.3 | ■ |
| | P.4 | ■ |
| | P.5 | ■ |
| M | M.1 | □ |
| | M.2 | □ |
| K | K.1 | ■ |
| | K.2 | ■ |
| | K.3 | □ |
| N | N.1 | □ |
| | N.2 | □ |
| | N.3 | □ |

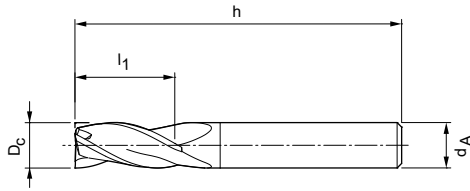
| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|--------|----------------|--------|---|-----------------|
| | | | D _c | d _A | h | l ₁ | Cx 45° | | |
| U01.003.050 SH Z2 HA | 5162785 | ● | 1,00 | 3,00 | 50,00 | 3,00 | - | 2 | HA |
| U01.5.004.050 SH Z2 HA | 5162787 | ● | 1,50 | 3,00 | 50,00 | 4,00 | - | 2 | HA |
| U02.005.050 SH Z2 HA | 5162788 | ● | 2,00 | 3,00 | 50,00 | 5,00 | - | 2 | HA |
| U02.5.006.050 SH Z2 HA | 5162789 | ● | 2,50 | 3,00 | 50,00 | 6,00 | - | 2 | HA |
| U03.008.057 Cx Z2 HB | 5162790 | ● | 3,00 | 6,00 | 57,00 | 8,00 | 0,03 | 2 | HB |
| U04.011.057 Cx Z2 HB | 5162792 | ● | 4,00 | 6,00 | 57,00 | 11,00 | 0,04 | 2 | HB |
| U05.013.057 Cx Z2 HB | 5162793 | ● | 5,00 | 6,00 | 57,00 | 13,00 | 0,05 | 2 | HB |
| U06.013.057 Cx Z2 HB | 5162794 | ● | 6,00 | 6,00 | 57,00 | 13,00 | 0,06 | 2 | HB |
| U07.019.063 Cx Z2 HB | 5162795 | ○ | 7,00 | 8,00 | 63,00 | 19,00 | 0,07 | 2 | HB |
| U08.019.063 Cx Z2 HB | 5162796 | ● | 8,00 | 8,00 | 63,00 | 19,00 | 0,08 | 2 | HB |
| U09.022.072 Cx Z2 HB | 5162797 | ○ | 9,00 | 10,00 | 72,00 | 22,00 | 0,09 | 2 | HB |
| U10.022.072 Cx Z2 HB | 5162799 | ● | 10,00 | 10,00 | 72,00 | 22,00 | 0,10 | 2 | HB |
| U12.026.083 Cx Z2 HB | 5162801 | ● | 12,00 | 12,00 | 83,00 | 26,00 | 0,12 | 2 | HB |
| U14.026.083 Cx Z2 HB | 5162813 | ○ | 14,00 | 14,00 | 83,00 | 26,00 | 0,14 | 2 | HB |
| U16.032.092 Cx Z2 HB | 5162814 | ○ | 16,00 | 16,00 | 92,00 | 32,00 | 0,16 | 2 | HB |
| U20.038.104 Cx Z2 HB | 5162815 | ● | 20,00 | 20,00 | 104,00 | 38,00 | 0,20 | 2 | HB |

Bestellbeispiel Order example: 1 Stück piece 5162785 oder or U01.003.050 SH Z2 HA
Genauere Schnittwertempfehlung siehe Seite 230
Detailed cutting recommendations, see page 230

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

UNItec long

Lange Ausführung Z3
Execution long Z3



| Hard Facts | |
|--------------------|-----------------|
| Fräserdurchmesser: | 3,00 - 16,00 mm |
| Beschichtung: | TiAlN PVD |
| Schneidenzahl: | Z = 3 |
| Drallwinkel: | 30° |
| | |
| Diameter: | 3.00 - 16.00 mm |
| Coating: | TiAlN PVD |
| Amount/Teeth: | Z = 3 |
| Helix angle: | 30° |

| UNItec long | | |
|-------------|-----|---|
| ISO | | |
| P | P.1 | ■ |
| | P.2 | ■ |
| | P.3 | ■ |
| | P.4 | ■ |
| | P.5 | ■ |
| M | M.1 | □ |
| | M.2 | □ |
| K | K.1 | ■ |
| | K.2 | ■ |
| | K.3 | □ |
| N | N.1 | □ |
| | N.2 | □ |
| | N.3 | □ |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|-------|----------------|---|-----------------|
| | | | D _c | d _A | h | l ₁ | | |
| U03.008.057 SH Z3 HA | 5162816 | ● | 3,00 | 6,00 | 57,00 | 8,00 | 3 | HA |
| U03.8.011.057 SH Z3 HA | 5162817 | ● | *3,80 | 6,00 | 57,00 | 11,00 | 3 | HA |
| U04.011.057 SH Z3 HA | 5162818 | ● | 4,00 | 6,00 | 57,00 | 11,00 | 3 | HA |
| U04.8.013.057 SH Z3 HA | 5162819 | ● | *4,80 | 6,00 | 57,00 | 13,00 | 3 | HA |
| U05.013.057 SH Z3 HA | 5162820 | ● | 5,00 | 6,00 | 57,00 | 13,00 | 3 | HA |
| U05.8.013.057 SH Z3 HA | 5162821 | ● | *5,80 | 6,00 | 57,00 | 13,00 | 3 | HA |
| U06.013.057 SH Z3 HA | 5162822 | ● | 6,00 | 6,00 | 57,00 | 13,00 | 3 | HA |
| U06.8.016.063 SH Z3 HA | 5162823 | ● | *6,80 | 8,00 | 63,00 | 16,00 | 3 | HA |
| U07.016.063 SH Z3 HA | 5162824 | ● | 7,00 | 8,00 | 63,00 | 16,00 | 3 | HA |
| U07.8.019.063 SH Z3 HA | 5162825 | ● | *7,80 | 8,00 | 63,00 | 19,00 | 3 | HA |
| U08.019.063 SH Z3 HA | 5162828 | ● | 8,00 | 8,00 | 63,00 | 19,00 | 3 | HA |
| U08.7.019.072 SH Z3 HA | 5162830 | ○ | *8,70 | 10,00 | 72,00 | 19,00 | 3 | HA |
| U09.019.072 SH Z3 HA | 5162831 | ○ | 9,00 | 10,00 | 72,00 | 19,00 | 3 | HA |
| U09.7.022.072 SH Z3 HA | 5162832 | ● | *9,70 | 10,00 | 72,00 | 22,00 | 3 | HA |
| U10.022.072 SH Z3 HA | 5162833 | ● | 10,00 | 10,00 | 72,00 | 22,00 | 3 | HA |
| U10.7.026.083 SH Z3 HA | 5162834 | ○ | *10,70 | 12,00 | 83,00 | 26,00 | 3 | HA |
| U11.026.083 SH Z3 HA | 5162835 | ● | 11,00 | 12,00 | 83,00 | 26,00 | 3 | HA |
| U11.7.026.083 SH Z3 HA | 5162836 | ○ | *11,70 | 12,00 | 83,00 | 26,00 | 3 | HA |
| U12.026.083 SH Z3 HA | 5162837 | ● | 12,00 | 12,00 | 83,00 | 26,00 | 3 | HA |
| U13.7.026.083 SH Z3 HA | 5162838 | ○ | *13,70 | 14,00 | 83,00 | 26,00 | 3 | HA |
| U14.026.083 SH Z3 HA | 5162839 | ● | 14,00 | 14,00 | 83,00 | 26,00 | 3 | HA |
| U15.7.032.092 SH Z3 HA | 5162840 | ○ | *15,70 | 16,00 | 92,00 | 32,00 | 3 | HA |
| U16.032.092 SH Z3 HA | 5162841 | ● | 16,00 | 16,00 | 92,00 | 32,00 | 3 | HA |

Bestellbeispiel Order example: 1 Stück piece 5162816 oder or U03.008.057 SH Z3 HA

Genauere Schnittwertempfehlung siehe Seite 230
Detailed cutting recommendations, see page 230

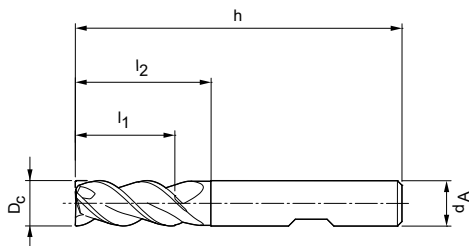
* Untermaßgrößen speziell zum Passnutfräsen
* Undersize sizes especially for keyway milling

● Verfügbar ab Lager Available from stock
● Kurzfristig lieferbar Shortly available
○ Lieferzeit auf Anfrage Delivery time on request

UNItec long neck

Lange Ausführung mit Hals Z3

Execution long neck Z3



| Hard Facts | |
|--------------------|-----------------|
| Fräserdurchmesser: | 1,00 - 16,00 mm |
| Beschichtung: | TiAlN PVD |
| Schneidenzahl: | Z = 3 |
| Drallwinkel: | 45° |
| Diameter: | 1.00 - 16.00 mm |
| Coating: | TiAlN PVD |
| Amount/Teeth: | Z = 3 |
| Helix angle: | 45° |

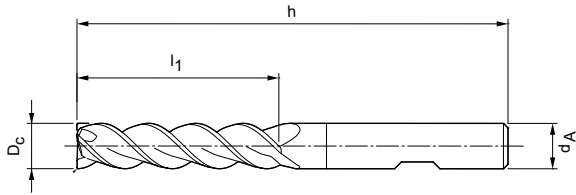
| UNItec long neck | | |
|------------------|-----|---|
| ISO | | |
| P | P.1 | ■ |
| | P.2 | ■ |
| | P.3 | ■ |
| | P.4 | ■ |
| | P.5 | ■ |
| M | M.1 | □ |
| | M.2 | □ |
| K | K.1 | ■ |
| | K.2 | ■ |
| | K.3 | □ |
| N | N.1 | □ |
| | N.2 | □ |
| | N.3 | □ |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|-------|----------------|----------------|--------|---|----|-----------------|
| | | | D _c | d _A | h | l ₁ | l ₂ | Cx 45° | | | |
| U01.002.038 SH Z3 HA | 5162842 | ● | *1,00 | 3,00 | 38,00 | 2,00 | – | – | 3 | HA | |
| U01.5.003.038 SH Z3 HA | 5162844 | ● | *1,50 | 3,00 | 38,00 | 3,00 | – | – | 3 | HA | |
| U02.004.054 SH Z3 HA | 5162846 | ● | *2,00 | 3,00 | 54,00 | 4,00 | – | – | 3 | HA | |
| U02.5.006.054 SH Z3 HB | 5162847 | ● | *2,50 | 6,00 | 54,00 | 6,00 | – | – | 3 | HB | |
| U03.008.057 Cx Z3 HB | 5162849 | ● | *3,00 | 6,00 | 57,00 | 8,00 | – | 0,05 | 3 | HB | |
| U04.011.057 Cx Z3 HB | 5162850 | ● | *4,00 | 6,00 | 57,00 | 11,00 | – | 0,06 | 3 | HB | |
| U05.013.057 Cx Z3 HB | 5162851 | ● | *5,00 | 6,00 | 57,00 | 13,00 | – | 0,08 | 3 | HB | |
| U06.013.057 Cx Z3 HB | 5162854 | ● | 6,00 | 6,00 | 57,00 | 13,00 | 20,00 | 0,09 | 3 | HB | |
| U08.019.063 Cx Z3 HB | 5162855 | ● | 8,00 | 8,00 | 63,00 | 19,00 | 25,00 | 0,12 | 3 | HB | |
| U10.022.072 Cx Z3 HB | 5162856 | ● | 10,00 | 10,00 | 72,00 | 22,00 | 30,00 | 0,15 | 3 | HB | |
| U12.026.083 Cx Z3 HB | 5162857 | ● | 12,00 | 12,00 | 83,00 | 26,00 | 36,00 | 0,18 | 3 | HB | |
| U14.026.083 Cx Z3 HB | 5162860 | ● | 14,00 | 14,00 | 83,00 | 26,00 | 36,00 | 0,21 | 3 | HB | |
| U16.032.092 Cx Z3 HB | 5162861 | ● | 16,00 | 16,00 | 92,00 | 32,00 | 42,00 | 0,24 | 3 | HB | |

Bestellbeispiel Order example: 1 Stück piece 5162842 oder or U01.002.038 SH Z3 HA
 Genaue Schnittwertempfehlung siehe Seite 230 * Ausführung ohne Hals
 Detailed cutting recommendations, see page 230 * Version without neck

● Verfügbar ab Lager Available from stock
 ● Kurzfristig lieferbar Shortly available
 ○ Lieferzeit auf Anfrage Delivery time on request

UNIttec extra long
 Extra Lange Ausführung Z3
 Execution extra long Z3



| Hard Facts | |
|--------------------|-----------------|
| Fräserdurchmesser: | 4,00 - 20,00 mm |
| Beschichtung: | TiAlN PVD |
| Schneidenzahl: | Z = 3 |
| Drallwinkel: | 45° |
| | |
| Diameter: | 4.00 - 20.00 mm |
| Coating: | TiAlN PVD |
| Amount/Teeth: | Z = 3 |
| Helix angle: | 45° |

| UNIttec extra long | | |
|--------------------|-----|---|
| ISO | | |
| P | P.1 | ■ |
| | P.2 | ■ |
| | P.3 | ■ |
| | P.4 | ■ |
| | P.5 | ■ |
| M | M.1 | □ |
| | M.2 | □ |
| K | K.1 | ■ |
| | K.2 | ■ |
| | K.3 | □ |
| N | N.1 | □ |
| | N.2 | □ |
| | N.3 | □ |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|--------|----------------|--------|---|-----------------|
| | | | D _C | d _A | h | l ₁ | Cx 45° | | |
| UP04.019.063 Cx Z3 HB | 5162864 | ● | 4,00 | 6,00 | 63,00 | 19,00 | 0,06 | 3 | HB |
| UP05.024.068 Cx Z3 HB | 5162865 | ● | 5,00 | 6,00 | 68,00 | 24,00 | 0,08 | 3 | HB |
| UP06.024.068 Cx Z3 HB | 5162866 | ● | 6,00 | 6,00 | 68,00 | 24,00 | 0,09 | 3 | HB |
| UP08.038.088 Cx Z3 HB | 5162868 | ● | 8,00 | 8,00 | 88,00 | 38,00 | 0,12 | 3 | HB |
| UP10.045.095 Cx Z3 HB | 5162869 | ● | 10,00 | 10,00 | 95,00 | 45,00 | 0,15 | 3 | HB |
| UP12.053.110 Cx Z3 HB | 5162871 | ● | 12,00 | 12,00 | 110,00 | 53,00 | 0,18 | 3 | HB |
| UP16.063.123 Cx Z3 HB | 5162872 | ● | 16,00 | 16,00 | 123,00 | 63,00 | 0,24 | 3 | HB |
| UP20.075.141 Cx Z3 HB | 5162873 | ● | 20,00 | 20,00 | 141,00 | 75,00 | 0,30 | 3 | HB |

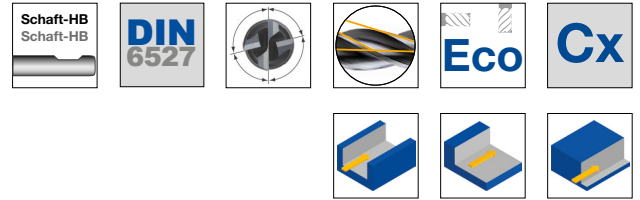
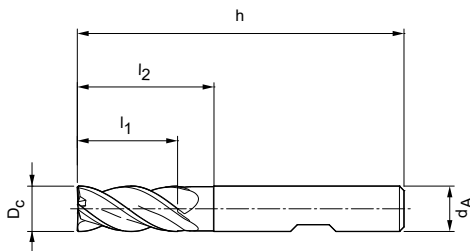
Bestellbeispiel Order example: 1 Stück piece 5162864 oder or UP04.019.063 Cx Z3 HB
 Genaue Schnittwertempfehlung siehe Seite 230
 Detailed cutting recommendations, see page 230

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

UNitec long

Lange Ausführung mit Hals Z4

Execution long neck Z4



| Hard Facts | |
|--------------------|------------------|
| Fräserdurchmesser: | 3,00 - 20,00 mm |
| Beschichtung: | AlCrN PVD |
| Schneidenzahl: | Z = 4 |
| Drallwinkel: | 36° - 38,5° |
| Besonderheiten: | Ungleichteilung |
| Diameter: | 3.00 - 20.00 mm |
| Coating: | AlCrN PVD |
| Amount/Teeth: | Z = 4 |
| Helix angle: | 36° - 38,5° |
| Special feature: | Unequal division |

| UNitec long | | |
|-------------|-----|---|
| ISO | | |
| P | P.1 | ■ |
| | P.2 | ■ |
| | P.3 | ■ |
| | P.4 | ■ |
| | P.5 | ■ |
| M | M.1 | ■ |
| | M.2 | ■ |
| K | K.1 | ■ |
| | K.2 | ■ |
| | K.3 | □ |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|--------|----------------|----------------|--------|---|----|-----------------|
| | | | D _C | d _A | h | l ₁ | l ₂ | Cx 45° | | | |
| U03.008.057 Cx Z4 HB | 5162874 | ● | *3,00 | 6,00 | 57,00 | 8,00 | - | 0,06 | 4 | HB | |
| U04.011.057 Cx Z4 HB | 5162878 | ● | *4,00 | 6,00 | 57,00 | 11,00 | - | 0,08 | 4 | HB | |
| U05.013.057 Cx Z4 HB | 5162879 | ● | *5,00 | 6,00 | 57,00 | 13,00 | - | 0,10 | 4 | HB | |
| U06.013.057 Cx Z4 HB | 5162880 | ● | 6,00 | 6,00 | 57,00 | 13,00 | 20,00 | 0,12 | 4 | HB | |
| U08.021.063 Cx Z4 HB | 5162881 | ● | 8,00 | 8,00 | 63,00 | 21,00 | 25,00 | 0,16 | 4 | HB | |
| U10.022.072 Cx Z4 HB | 5162882 | ● | 10,00 | 10,00 | 72,00 | 22,00 | 30,00 | 0,20 | 4 | HB | |
| U12.026.083 Cx Z4 HB | 5162883 | ● | 12,00 | 12,00 | 83,00 | 26,00 | 36,00 | 0,24 | 4 | HB | |
| U14.026.083 Cx Z4 HB | 5162884 | ○ | 14,00 | 14,00 | 83,00 | 26,00 | 36,00 | 0,28 | 4 | HB | |
| U16.036.092 Cx Z4 HB | 5162886 | ● | 16,00 | 16,00 | 92,00 | 36,00 | 42,00 | 0,32 | 4 | HB | |
| U18.036.092 Cx Z4 HB | 5162890 | ○ | 18,00 | 18,00 | 92,00 | 36,00 | 42,00 | 0,36 | 4 | HB | |
| U20.041.104 Cx Z4 HB | 5162893 | ○ | 20,00 | 20,00 | 104,00 | 41,00 | 53,00 | 0,40 | 4 | HB | |

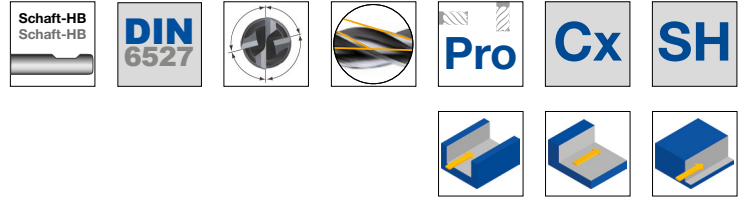
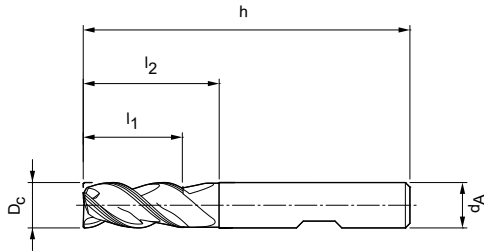
Bestellbeispiel Order example: 1 Stück piece 5162874 oder or U03.008.057 Cx Z4 HB
 Genaue Schnittwertempfehlung siehe Seite 230 * Ausführung ohne Hals
 Detailed cutting recommendations, see page 230 * Version without neck

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

UNItec Pro slot long neck

Lange Ausführung mit Hals Z3

Execution long neck Z3



| Hard Facts | |
|--------------------|------------------|
| Fräserdurchmesser: | 1,00 - 20,00 mm |
| Beschichtung: | AlCrN PVD |
| Schneidenzahl: | Z = 3 |
| Drallwinkel: | 42° - 43° |
| Besonderheiten: | Ungleichteilung |
| | |
| Diameter: | 1.00 - 20.00 mm |
| Coating: | AlCrN PVD |
| Amount/Teeth: | Z = 3 |
| Helix angle: | 42° - 43° |
| Special feature: | Unequal division |

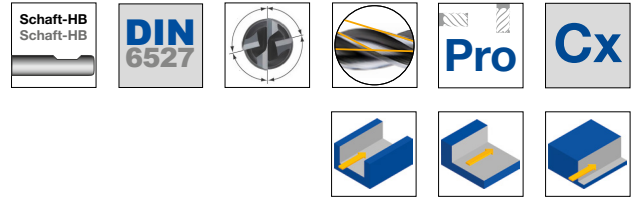
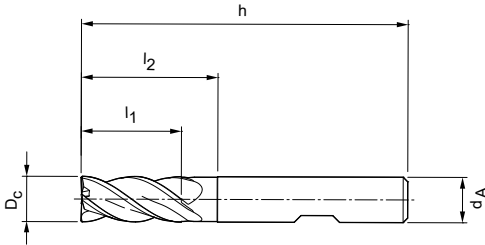
| UNItec Pro slot long neck | | |
|---------------------------|-----|---|
| ISO | | |
| P | P.1 | ■ |
| | P.2 | ■ |
| | P.3 | ■ |
| | P.4 | ■ |
| | P.5 | ■ |
| M | M.1 | □ |
| | M.2 | □ |
| K | K.1 | ■ |
| | K.2 | ■ |
| | K.3 | ■ |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|--------|----------------|----------------|--------|---|----|-----------------|
| | | | D _c | d _A | h | l ₁ | l ₂ | Cx 45° | | | |
| UP01.003.054 SH Z3 HB | 5163291 | ● | 1,00 | 6,00 | 54,00 | 3,00 | 4,00 | – | 3 | HB | |
| UP01.5.004.054 SH Z3 HB | 5163292 | ● | 1,50 | 6,00 | 54,00 | 4,00 | 6,00 | – | 3 | HB | |
| UP02.005.054 SH Z3 HB | 5163293 | ● | 2,00 | 6,00 | 54,00 | 5,00 | 8,00 | – | 3 | HB | |
| UP02.5.007.054 SH Z3 HB | 5163296 | ● | 2,50 | 6,00 | 54,00 | 7,00 | 10,00 | – | 3 | HB | |
| UP03.008.057 Cx Z3 HB | 5163299 | ● | 3,00 | 6,00 | 57,00 | 8,00 | 12,50 | 0,06 | 3 | HB | |
| UP04.011.057 Cx Z3 HB | 5163300 | ● | 4,00 | 6,00 | 57,00 | 11,00 | 15,00 | 0,08 | 3 | HB | |
| UP05.013.057 Cx Z3 HB | 5163301 | ● | 5,00 | 6,00 | 57,00 | 13,00 | 16,00 | 0,10 | 3 | HB | |
| UP06.013.057 Cx Z3 HB | 5163303 | ● | 6,00 | 6,00 | 57,00 | 13,00 | 20,00 | 0,12 | 3 | HB | |
| UP08.021.063 Cx Z3 HB | 5163304 | ● | 8,00 | 8,00 | 63,00 | 21,00 | 27,00 | 0,16 | 3 | HB | |
| UP10.022.072 Cx Z3 HB | 5163305 | ● | 10,00 | 10,00 | 72,00 | 22,00 | 30,00 | 0,20 | 3 | HB | |
| UP12.026.083 Cx Z3 HB | 5163306 | ● | 12,00 | 12,00 | 83,00 | 26,00 | 36,00 | 0,24 | 3 | HB | |
| UP14.026.083 Cx Z3 HB | 5163307 | ○ | 14,00 | 14,00 | 83,00 | 26,00 | 36,00 | 0,28 | 3 | HB | |
| UP16.036.092 Cx Z3 HB | 5163308 | ● | 16,00 | 16,00 | 92,00 | 36,00 | 44,00 | 0,32 | 3 | HB | |
| UP18.036.092 Cx Z3 HB | 5163310 | ● | 18,00 | 18,00 | 92,00 | 36,00 | 44,00 | 0,36 | 3 | HB | |
| UP20.041.104 Cx Z3 HB | 5163311 | ● | 20,00 | 20,00 | 104,00 | 41,00 | 55,00 | 0,40 | 3 | HB | |

Bestellbeispiel Order example: 1 Stück piece 5163291 oder or UP01.003.054 SH Z3 HB
 Genaue Schnittwertempfehlung siehe Seite 232
 Detailed cutting recommendations, see page 232

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

UNIttec Pro long neck
 Lange Ausführung mit Hals Z4
 Execution long neck Z4



| Hard Facts | |
|--------------------|------------------|
| Fräserdurchmesser: | 3,00 - 25,00 mm |
| Beschichtung: | AlCrN PVD |
| Schneidenzahl: | Z = 4 |
| Drallwinkel: | 36°/38° |
| Besonderheiten: | Ungleichteilung |
| Diameter: | 3.00 - 25.00 mm |
| Coating: | AlCrN PVD |
| Amount/Teeth: | Z = 4 |
| Helix angle: | 36°/38° |
| Special feature: | Unequal division |

| UNIttec Pro long neck | | |
|-----------------------|-----|---|
| ISO | | |
| P | P.1 | ■ |
| | P.2 | ■ |
| | P.3 | ■ |
| | P.4 | ■ |
| | P.5 | ■ |
| M | M.1 | ■ |
| | M.2 | ■ |
| K | K.1 | ■ |
| | K.2 | ■ |
| | K.3 | ■ |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|--------|----------------|----------------|--------|---|-----------------|
| | | | D _c | d _A | h | l ₁ | l ₂ | Cx 45° | | |
| UP03.008.057 Cx Z4 HB | 5162959 | ● | 3,00 | 6,00 | 57,00 | 8,00 | 9,50 | 0,06 | 4 | HB |
| UP04.011.057 Cx Z4 HB | 5162962 | ● | 4,00 | 6,00 | 57,00 | 11,00 | 13,00 | 0,08 | 4 | HB |
| UP05.013.057 Cx Z4 HB | 5162964 | ● | 5,00 | 6,00 | 57,00 | 13,00 | 15,50 | 0,10 | 4 | HB |
| UP06.013.057 Cx Z4 HB | 5162965 | ● | 6,00 | 6,00 | 57,00 | 13,00 | 20,00 | 0,12 | 4 | HB |
| UP07.016.063 Cx Z4 HB | 5163148 | ○ | 7,00 | 8,00 | 63,00 | 16,00 | 25,00 | 0,14 | 4 | HB |
| UP08.021.063 Cx Z4 HB | 5162967 | ● | 8,00 | 8,00 | 63,00 | 21,00 | 25,00 | 0,16 | 4 | HB |
| UP09.022.072 Cx Z4 HB | 5163150 | ○ | 9,00 | 10,00 | 72,00 | 22,00 | 30,00 | 0,18 | 4 | HB |
| UP10.022.072 Cx Z4 HB | 5162969 | ● | 10,00 | 10,00 | 72,00 | 22,00 | 30,00 | 0,20 | 4 | HB |
| UP12.026.083 Cx Z4 HB | 5162971 | ● | 12,00 | 12,00 | 83,00 | 26,00 | 36,00 | 0,24 | 4 | HB |
| UP14.026.083 Cx Z4 HB | 5163152 | ○ | 14,00 | 14,00 | 83,00 | 26,00 | 36,00 | 0,28 | 4 | HB |
| UP16.036.092 Cx Z4 HB | 5162972 | ● | 16,00 | 16,00 | 92,00 | 36,00 | 42,00 | 0,32 | 4 | HB |
| UP18.036.092 Cx Z4 HB | 5163153 | ○ | 18,00 | 18,00 | 92,00 | 36,00 | 47,00 | 0,36 | 4 | HB |
| UP20.041.104 Cx Z4 HB | 5163154 | ○ | 20,00 | 20,00 | 104,00 | 41,00 | 55,00 | 0,40 | 4 | HB |
| UP25.068.136 Cx Z4 HB | 5163155 | ○ | 25,00 | 25,00 | 136,00 | 68,00 | 80,00 | 0,50 | 4 | HB |

Bestellbeispiel Order example: 1 Stück piece 5162959 oder or UP03.008.057 Cx Z4 HB

Genauere Schnittwertempfehlung siehe Seite 232
 Detailed cutting recommendations, see page 232

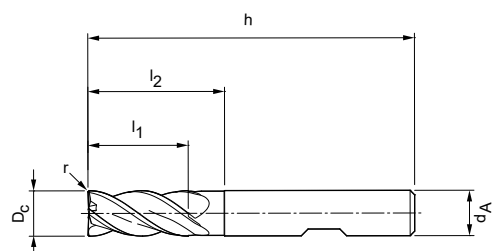
* Unterraßgrößen speziell zum Passnutfräsen
 * Undersize sizes especially for keyway milling

● Verfügbar ab Lager Available from stock
 ○ Kurzfristig lieferbar Shortly available
 ○ Lieferzeit auf Anfrage Delivery time on request

UNItec Pro long neck FR

Lange Ausführung mit Hals und Eckenradius Z4

Execution long neck and full radius Z4



Hard Facts

Fräserdurchmesser: 4,00 - 20,00 mm
 Beschichtung: AlCrN PVD
 Schneidenzahl: Z = 4
 Drallwinkel: 36°/38°
 Besonderheiten: Ungleichteilung

Diameter: 4.00 - 20.00 mm
 Coating: AlCrN PVD
 Amount/Teeth: Z = 4
 Helix angle: 36°/38°
 Special feature: Unequal division

UNItec Pro long neck FR

| ISO | | |
|-----|-----|---|
| P | P.1 | ■ |
| | P.2 | ■ |
| | P.3 | ■ |
| | P.4 | ■ |
| | P.5 | ■ |
| M | M.1 | ■ |
| | M.2 | ■ |
| K | K.1 | ■ |
| | K.2 | ■ |
| | K.3 | ■ |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|-------|----------------|----------------|------|---|-----------------|
| | | | D _C | d _A | h | l ₁ | l ₂ | r | | |
| UP04.011.057 FR0.4 Z4 HB | 5163157 | ● | 4,00 | 6,00 | 57,00 | 11,00 | 13,00 | 0,40 | 4 | HB |
| UP04.011.057 FR0.5 Z4 HB | 5163159 | ● | 4,00 | 6,00 | 57,00 | 11,00 | 13,00 | 0,50 | 4 | HB |
| UP04.011.057 FR1.0 Z4 HB | 5163161 | ● | 4,00 | 6,00 | 57,00 | 11,00 | 13,00 | 1,00 | 4 | HB |
| UP05.013.057 FR0.5 Z4 HB | 5163162 | ● | 5,00 | 6,00 | 57,00 | 13,00 | 15,50 | 0,50 | 4 | HB |
| UP05.013.057 FR1.0 Z4 HB | 5163167 | ● | 5,00 | 6,00 | 57,00 | 13,00 | 15,50 | 1,00 | 4 | HB |
| UP06.013.057 FR0.5 Z4 HB | 5163170 | ● | 6,00 | 6,00 | 57,00 | 13,00 | 20,00 | 0,50 | 4 | HB |
| UP06.013.057 FR1.0 Z4 HB | 5163172 | ● | 6,00 | 6,00 | 57,00 | 13,00 | 20,00 | 1,00 | 4 | HB |
| UP06.013.057 FR1.5 Z4 HB | 5163174 | ● | 6,00 | 6,00 | 57,00 | 13,00 | 20,00 | 1,50 | 4 | HB |
| UP06.013.057 FR2.0 Z4 HB | 5163175 | ● | 6,00 | 6,00 | 57,00 | 13,00 | 20,00 | 2,00 | 4 | HB |
| UP08.021.063 FR0.5 Z4 HB | 5163176 | ● | 8,00 | 8,00 | 63,00 | 21,00 | 25,00 | 0,50 | 4 | HB |
| UP08.021.063 FR1.0 Z4 HB | 5163179 | ● | 8,00 | 8,00 | 63,00 | 21,00 | 25,00 | 1,00 | 4 | HB |
| UP08.021.063 FR1.5 Z4 HB | 5163185 | ● | 8,00 | 8,00 | 63,00 | 21,00 | 25,00 | 1,50 | 4 | HB |
| UP08.021.063 FR2.0 Z4 HB | 5163196 | ● | 8,00 | 8,00 | 63,00 | 21,00 | 25,00 | 2,00 | 4 | HB |
| UP08.021.063 FR2.5 Z4 HB | 5163198 | ● | 8,00 | 8,00 | 63,00 | 21,00 | 25,00 | 2,50 | 4 | HB |
| UP08.021.063 FR3.0 Z4 HB | 5163199 | ● | 8,00 | 8,00 | 63,00 | 21,00 | 25,00 | 3,00 | 4 | HB |

Bestellbeispiel Order example: 1 Stück piece 5163157 oder or UP04.011.057 FR0.4 Z4 HB

Genauere Schnittwertempfehlung siehe Seite 232

Detailed cutting recommendations, see page 232

● Verfügbar ab Lager Available from stock

● Kurzfristig lieferbar Shortly available

○ Lieferzeit auf Anfrage Delivery time on request

UNIttec Pro long neck FR

Lange Ausführung mit Hals und Eckenradius Z4

Execution long neck and full radius Z4

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|--------|----------------|----------------|------|---|-----------------|
| | | | D _C | d _A | h | l ₁ | l ₂ | r | | |
| UP10.022.072 FR0.5 Z4 HB | 5163201 | ● | 10,00 | 10,00 | 72,00 | 22,00 | 30,00 | 0,50 | 4 | HB |
| UP10.022.072 FR1.0 Z4 HB | 5162767 | ● | 10,00 | 10,00 | 72,00 | 22,00 | 30,00 | 1,00 | 4 | HB |
| UP10.022.072 FR1.5 Z4 HB | 5163204 | ● | 10,00 | 10,00 | 72,00 | 22,00 | 30,00 | 1,50 | 4 | HB |
| UP10.022.072 FR2.0 Z4 HB | 5163207 | ● | 10,00 | 10,00 | 72,00 | 22,00 | 30,00 | 2,00 | 4 | HB |
| UP10.022.072 FR2.5 Z4 HB | 5163208 | ● | 10,00 | 10,00 | 72,00 | 22,00 | 30,00 | 2,50 | 4 | HB |
| UP10.022.072 FR3.0 Z4 HB | 5163211 | ● | 10,00 | 10,00 | 72,00 | 22,00 | 30,00 | 3,00 | 4 | HB |
| UP12.026.083 FR0.5 Z4 HB | 5163212 | ● | 12,00 | 12,00 | 83,00 | 26,00 | 36,00 | 0,50 | 4 | HB |
| UP12.026.083 FR1.0 Z4 HB | 5162768 | ● | 12,00 | 12,00 | 83,00 | 26,00 | 36,00 | 1,00 | 4 | HB |
| UP12.026.083 FR1.5 Z4 HB | 5163214 | ● | 12,00 | 12,00 | 83,00 | 26,00 | 36,00 | 1,50 | 4 | HB |
| UP12.026.083 FR2.0 Z4 HB | 5163227 | ● | 12,00 | 12,00 | 83,00 | 26,00 | 36,00 | 2,00 | 4 | HB |
| UP12.026.083 FR2.5 Z4 HB | 5163228 | ● | 12,00 | 12,00 | 83,00 | 26,00 | 36,00 | 2,50 | 4 | HB |
| UP12.026.083 FR3.0 Z4 HB | 5163229 | ● | 12,00 | 12,00 | 83,00 | 26,00 | 36,00 | 3,00 | 4 | HB |
| UP12.026.083 FR4.0 Z4 HB | 5163230 | ● | 12,00 | 12,00 | 83,00 | 26,00 | 36,00 | 4,00 | 4 | HB |
| UP16.036.092 FR0.5 Z4 HB | 5163231 | ● | 16,00 | 16,00 | 92,00 | 36,00 | 42,00 | 0,50 | 4 | HB |
| UP16.036.092 FR1.0 Z4 HB | 5163232 | ● | 16,00 | 16,00 | 92,00 | 36,00 | 42,00 | 1,00 | 4 | HB |
| UP16.036.092 FR2.0 Z4 HB | 5163233 | ● | 16,00 | 16,00 | 92,00 | 36,00 | 42,00 | 2,00 | 4 | HB |
| UP16.036.092 FR2.5 Z4 HB | 5163234 | ● | 16,00 | 16,00 | 92,00 | 36,00 | 42,00 | 2,50 | 4 | HB |
| UP16.036.092 FR3.0 Z4 HB | 5163236 | ● | 16,00 | 16,00 | 92,00 | 36,00 | 42,00 | 3,00 | 4 | HB |
| UP16.036.092 FR4.0 Z4 HB | 5163237 | ● | 16,00 | 16,00 | 92,00 | 36,00 | 42,00 | 4,00 | 4 | HB |
| UP20.041.104 FR1.0 Z4 HB | 5163240 | ● | 20,00 | 20,00 | 104,00 | 41,00 | 52,00 | 1,00 | 4 | HB |
| UP20.041.104 FR2.0 Z4 HB | 5163243 | ● | 20,00 | 20,00 | 104,00 | 41,00 | 52,00 | 2,00 | 4 | HB |
| UP20.041.104 FR3.0 Z4 HB | 5163245 | ● | 20,00 | 20,00 | 104,00 | 41,00 | 52,00 | 3,00 | 4 | HB |
| UP20.041.104 FR4.0 Z4 HB | 5163247 | ● | 20,00 | 20,00 | 104,00 | 41,00 | 52,00 | 4,00 | 4 | HB |

Bestellbeispiel Order example: 1 Stück piece 5163201 oder or UP10.022.072 FR0.5 Z4 HB

Genauere Schnittwertempfehlung siehe Seite 232

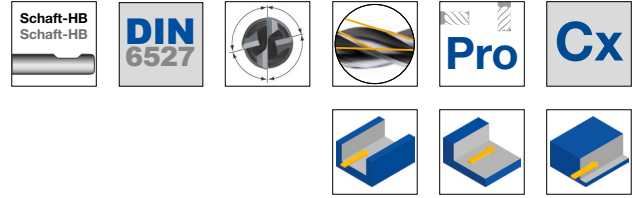
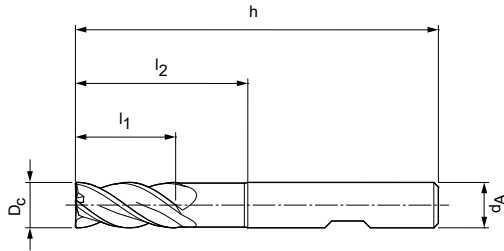
Detailed cutting recommendations, see page 232

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

UNItec Pro overlength neck

Überlange Ausführung mit Hals Z4

Execution overlength neck Z4



| Hard Facts | |
|--------------------|------------------|
| Fräserdurchmesser: | 5,00 - 25,00 mm |
| Beschichtung: | AlCrN PVD |
| Schneidenzahl: | Z = 4 |
| Achswinkel: | 36°/38° |
| Besonderheiten: | Ungleichteilung |
| Diameter: | 5.00 - 25.00 mm |
| Coating: | AlCrN PVD |
| Amount/Teeth: | Z = 4 |
| Axis angle: | 36°/38° |
| Special feature: | Unequal division |

| UNItec Pro overlength neck | | |
|----------------------------|-----|---|
| ISO | | |
| P | P.1 | ■ |
| | P.2 | ■ |
| | P.3 | ■ |
| | P.4 | ■ |
| | P.5 | ■ |
| M | M.1 | ■ |
| | M.2 | ■ |
| K | K.1 | ■ |
| | K.2 | ■ |
| | K.3 | ■ |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|--------|----------------|----------------|---------|---|-----------------|
| | | | D _c | d _A | h | l ₁ | l ₂ | C x 45° | | |
| UP05.013.062 Cx Z4 HB | 5163248 | ● | 5,00 | 6,00 | 62,00 | 13,00 | 24,00 | 0,10 | 4 | HB |
| UP06.013.062 Cx Z4 HB | 5163252 | ● | 6,00 | 6,00 | 62,00 | 13,00 | 25,00 | 0,12 | 4 | HB |
| UP08.021.068 Cx Z4 HB | 5163256 | ● | 8,00 | 8,00 | 68,00 | 21,00 | 30,00 | 0,16 | 4 | HB |
| UP10.022.080 Cx Z4 HB | 5163258 | ● | 10,00 | 10,00 | 80,00 | 22,00 | 38,00 | 0,20 | 4 | HB |
| UP12.026.093 Cx Z4 HB | 5163259 | ● | 12,00 | 12,00 | 93,00 | 26,00 | 46,00 | 0,24 | 4 | HB |
| UP14.026.099 Cx Z4 HB | 5163261 | ● | 14,00 | 14,00 | 99,00 | 26,00 | 52,00 | 0,28 | 4 | HB |
| UP16.036.108 Cx Z4 HB | 5163263 | ● | 16,00 | 16,00 | 108,00 | 36,00 | 58,00 | 0,32 | 4 | HB |
| UP18.036.117 Cx Z4 HB | 5163266 | ● | 18,00 | 18,00 | 117,00 | 36,00 | 67,00 | 0,36 | 4 | HB |
| UP20.041.126 Cx Z4 HB | 5163268 | ● | 20,00 | 20,00 | 126,00 | 41,00 | 74,00 | 0,40 | 4 | HB |
| UP25.050.150 Cx Z4 HB | 5163269 | ○ | 25,00 | 25,00 | 150,00 | 50,00 | 92,00 | 0,50 | 4 | HB |

Bestellbeispiel Order example: 1 Stück piece 5163248 oder or UP05.013.062 Cx Z4 HB

Genauere Schnittwertempfehlung siehe Seite 232

Detailed cutting recommendations, see page 232

● Verfügbar ab Lager Available from stock

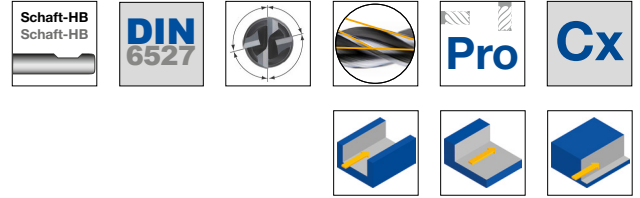
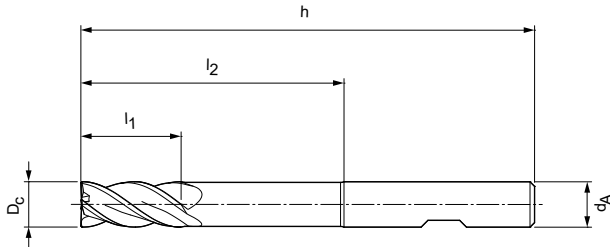
● Kurzfristig lieferbar Shortly available

○ Lieferzeit auf Anfrage Delivery time on request

UNitec Pro extra long neck

Extra lange Ausführung mit Hals Z4

Execution extra long neck Z4



| Hard Facts | |
|--------------------|------------------|
| Fräserdurchmesser: | 5,00 - 25,00 mm |
| Beschichtung: | AlCrN PVD |
| Schneidezah: | Z = 4 |
| Drallwinkel: | 36°/38° |
| Besonderheiten: | Ungleichteilung |
| | |
| Diameter: | 5.00 - 25.00 mm |
| Coating: | AlCrN PVD |
| Amount/Teeth: | Z = 4 |
| Helix angle: | 36°/38° |
| Special feature: | Unequal division |

| UNitec Pro extra long neck | | |
|----------------------------|-----|---|
| ISO | | |
| P | P.1 | ■ |
| | P.2 | ■ |
| | P.3 | ■ |
| | P.4 | ■ |
| | P.5 | ■ |
| M | M.1 | ■ |
| | M.2 | ■ |
| K | K.1 | ■ |
| | K.2 | ■ |
| | K.3 | ■ |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|--------|----------------|----------------|--------|---|-----------------|
| | | | D _C | d _A | h | l ₁ | l ₂ | Cx 45° | | |
| UP05.013.080 Cx Z4 HB | 5163270 | ● | 5,00 | 6,00 | 80,00 | 13,00 | 42,00 | 0,10 | 4 | HB |
| UP06.013.080 Cx Z4 HB | 5163272 | ● | 6,00 | 6,00 | 80,00 | 13,00 | 42,00 | 0,12 | 4 | HB |
| UP08.021.100 Cx Z4 HB | 5163274 | ● | 8,00 | 8,00 | 100,00 | 21,00 | 62,00 | 0,16 | 4 | HB |
| UP10.022.100 Cx Z4 HB | 5163276 | ● | 10,00 | 10,00 | 100,00 | 22,00 | 58,00 | 0,20 | 4 | HB |
| UP12.026.120 Cx Z4 HB | 5163279 | ● | 12,00 | 12,00 | 120,00 | 26,00 | 73,00 | 0,24 | 4 | HB |
| UP14.026.120 Cx Z4 HB | 5163280 | ● | 14,00 | 14,00 | 120,00 | 26,00 | 73,00 | 0,28 | 4 | HB |
| UP16.036.150 Cx Z4 HB | 5163281 | ● | 16,00 | 16,00 | 150,00 | 36,00 | 100,00 | 0,32 | 4 | HB |
| UP18.036.150 Cx Z4 HB | 5163282 | ○ | 18,00 | 18,00 | 150,00 | 36,00 | 100,00 | 0,36 | 4 | HB |
| UP20.041.150 Cx Z4 HB | 5163283 | ● | 20,00 | 20,00 | 150,00 | 41,00 | 98,00 | 0,40 | 4 | HB |
| UP25.050.175 Cx Z4 HB | 5163286 | ○ | 25,00 | 25,00 | 175,00 | 50,00 | 117,00 | 0,50 | 4 | HB |

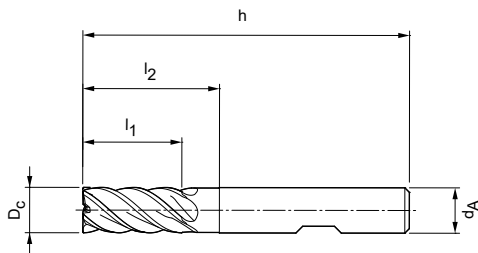
Bestellbeispiel Order example: 1 Stück piece 5163270 oder or UP05.013.080 Cx Z4 HB
 Genaue Schnittwertempfehlung siehe Seite 232
 Detailed cutting recommendations, see page 232

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

UNItec Pro Silence long neck

Lange Ausführung mit Hals Z5

Execution long neck Z5



| Hard Facts | |
|--------------------|------------------|
| Fräserdurchmesser: | 4,00 - 25,00 mm |
| Beschichtung: | AlCrN PVD |
| Schneidenzahl: | Z = 5 |
| Drallwinkel: | 41° - 42° |
| Besonderheiten: | Ungleichteilung |
| | |
| Diameter: | 4.00 - 25.00 mm |
| Coating: | AlCrN PVD |
| Amount/Teeth: | Z = 5 |
| Helix angle: | 41° - 42° |
| Special feature: | Unequal division |

| UNItec Pro Silence long neck | | |
|------------------------------|-----|---|
| ISO | | |
| P | P.1 | ■ |
| | P.2 | ■ |
| | P.3 | ■ |
| | P.4 | ■ |
| | P.5 | ■ |
| M | M.1 | ■ |
| | M.2 | ■ |
| K | K.1 | ■ |
| | K.2 | ■ |
| | K.3 | ■ |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|--------|----------------|----------------|--------|---|-----------------|
| | | | D _C | d _A | h | l ₁ | l ₂ | Cx 45° | | |
| UP04.011.057 Cx Z5 HB | 5163312 | ● | 4,00 | 6,00 | 57,00 | 11,00 | 13,00 | 0,08 | 5 | HB |
| UP05.013.057 Cx Z5 HB | 5163314 | ● | 5,00 | 6,00 | 57,00 | 13,00 | 15,50 | 0,10 | 5 | HB |
| UP06.013.057 Cx Z5 HB | 5163317 | ● | 6,00 | 6,00 | 57,00 | 13,00 | 19,00 | 0,12 | 5 | HB |
| UP08.019.063 Cx Z5 HB | 5163318 | ● | 8,00 | 8,00 | 63,00 | 19,00 | 25,00 | 0,16 | 5 | HB |
| UP10.022.072 Cx Z5 HB | 5163320 | ● | 10,00 | 10,00 | 72,00 | 22,00 | 30,00 | 0,20 | 5 | HB |
| UP12.026.083 Cx Z5 HB | 5163323 | ● | 12,00 | 12,00 | 83,00 | 26,00 | 36,00 | 0,24 | 5 | HB |
| UP14.026.083 Cx Z5 HB | 5163325 | ○ | 14,00 | 14,00 | 83,00 | 26,00 | 36,00 | 0,28 | 5 | HB |
| UP16.032.092 Cx Z5 HB | 5163327 | ● | 16,00 | 16,00 | 92,00 | 32,00 | 42,00 | 0,32 | 5 | HB |
| UP18.032.092 Cx Z5 HB | 5163329 | ● | 18,00 | 18,00 | 92,00 | 32,00 | 42,00 | 0,36 | 5 | HB |
| UP20.041.104 Cx Z5 HB | 5163331 | ● | 20,00 | 20,00 | 104,00 | 41,00 | 52,00 | 0,40 | 5 | HB |
| UP25.050.125 Cx Z5 HB | 5163332 | ● | 25,00 | 25,00 | 125,00 | 50,00 | 65,00 | 0,50 | 5 | HB |

Bestellbeispiel Order example: 1 Stück piece 5163312 oder or UP04.011.057 Cx Z5 HB

Genaue Schnitwertempfehlung siehe Seite 234

Detailed cutting recommendations, see page 234

● Verfügbar ab Lager Available from stock

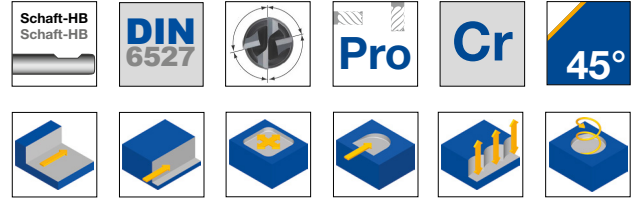
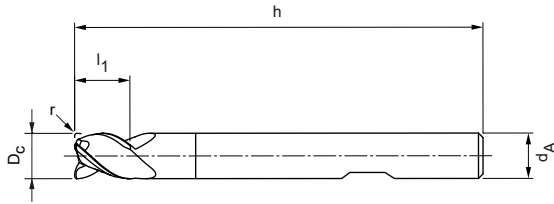
○ Kurzfristig lieferbar Shortly available

○ Lieferzeit auf Anfrage Delivery time on request

MULTitec Universal short

Kurze Ausführung Z3

Execution short Z3



| Hard Facts | |
|--------------------|--|
| Fräserdurchmesser: | 3,80 - 20,00 mm |
| Beschichtung: | AlCrN PVD |
| Schneidenzahl: | Z = 3 |
| Drallwinkel: | 42° |
| Besonderheiten: | Ungleichteilung, spezielle Stirngeometrie zum Schrägen eintauchen bis max 45°, Ideal für helikales Eintauchen und Tauchfräsen |
| Diameter: | 3.80 - 20.00 mm |
| Coating: | AlCrN PVD |
| Amount/Teeth: | Z = 3 |
| Helix angle: | 42° |
| Special feature: | Unequal division, special geometrical design for ramping in up to max. ramping angled 45°, excellent for helical ramping in and ramp milling |

| MULTitec Universal short | | |
|--------------------------|-----|---|
| ISO | | |
| P | P.1 | ■ |
| | P.2 | ■ |
| | P.3 | ■ |
| | P.4 | ■ |
| | P.5 | ■ |
| M | M.1 | ■ |
| | M.2 | ■ |
| K | K.1 | ■ |
| | K.2 | ■ |
| | K.3 | ■ |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|-------|----------------|------|---|-----------------|
| | | | D _c | d _A | h | l ₁ | r | | |
| MU03.8.005.054 Cr Z3 HB | 5163555 | ● | 3,80 | 6,00 | 54,00 | 5,00 | 0,12 | 3 | HB |
| MU04.005.054 Cr Z3 HB | 5163556 | ● | 4,00 | 6,00 | 54,00 | 5,00 | 0,12 | 3 | HB |
| MU04.8.006.054 Cr Z3 HB | 5163557 | ● | 4,80 | 6,00 | 54,00 | 6,00 | 0,20 | 3 | HB |
| MU05.006.054 Cr Z3 HB | 5163558 | ● | 5,00 | 6,00 | 54,00 | 6,00 | 0,20 | 3 | HB |
| MU05.7.007.054 Cr Z3 HB | 5163559 | ● | 5,70 | 6,00 | 54,00 | 7,00 | 0,20 | 3 | HB |
| MU06.007.054 Cr Z3 HB | 5163560 | ● | 6,00 | 6,00 | 54,00 | 7,00 | 0,20 | 3 | HB |
| MU06.7.008.058 Cr Z3 HB | 5163562 | ○ | 6,70 | 8,00 | 58,00 | 8,00 | 0,20 | 3 | HB |
| MU07.008.058 Cr Z3 HB | 5163563 | ● | 7,00 | 8,00 | 58,00 | 8,00 | 0,20 | 3 | HB |
| MU07.7.009.058 Cr Z3 HB | 5163564 | ● | 7,70 | 8,00 | 58,00 | 9,00 | 0,20 | 3 | HB |
| MU08.009.058 Cr Z3 HB | 5163566 | ● | 8,00 | 8,00 | 58,00 | 9,00 | 0,20 | 3 | HB |
| MU08.7.010.066 Cr Z3 HB | 5163567 | ● | 8,70 | 10,00 | 66,00 | 10,00 | 0,32 | 3 | HB |
| MU09.010.066 Cr Z3 HB | 5163571 | ● | 9,00 | 10,00 | 66,00 | 10,00 | 0,32 | 3 | HB |
| MU09.7.011.066 Cr Z3 HB | 5163575 | ● | 9,70 | 10,00 | 66,00 | 11,00 | 0,32 | 3 | HB |
| MU10.011.066 Cr Z3 HB | 5163576 | ● | 10,00 | 10,00 | 66,00 | 11,00 | 0,32 | 3 | HB |
| MU11.7.012.073 Cr Z3 HB | 5163577 | ● | 11,70 | 12,00 | 73,00 | 12,00 | 0,32 | 3 | HB |
| MU12.012.073 Cr Z3 HB | 5163578 | ● | 12,00 | 12,00 | 73,00 | 12,00 | 0,32 | 3 | HB |
| MU13.7.014.075 Cr Z3 HB | 5163579 | ○ | 13,70 | 14,00 | 75,00 | 14,00 | 0,32 | 3 | HB |
| MU14.014.075 Cr Z3 HB | 5163580 | ● | 14,00 | 14,00 | 75,00 | 14,00 | 0,32 | 3 | HB |
| MU15.5.016.082 Cr Z3 HB | 5163582 | ● | 15,50 | 16,00 | 82,00 | 16,00 | 0,32 | 3 | HB |
| MU16.016.082 Cr Z3 HB | 5163583 | ● | 16,00 | 16,00 | 82,00 | 16,00 | 0,32 | 3 | HB |
| MU17.5.018.084 Cr Z3 HB | 5163585 | ○ | 17,50 | 18,00 | 84,00 | 18,00 | 0,32 | 3 | HB |
| MU18.018.084 Cr Z3 HB | 5163586 | ○ | 18,00 | 18,00 | 84,00 | 18,00 | 0,32 | 3 | HB |
| MU19.5.020.092 Cr Z3 HB | 5163588 | ○ | 19,50 | 20,00 | 92,00 | 20,00 | 0,50 | 3 | HB |
| MU20.020.092 Cr Z3 HB | 5163589 | ● | 20,00 | 20,00 | 92,00 | 20,00 | 0,50 | 3 | HB |

Bestellbeispiel Order example: 1 Stück piece 5163555 oder or MU03.8.005.054 Cr Z3 HB

Genauere Schnittwertempfehlung siehe Seite 234

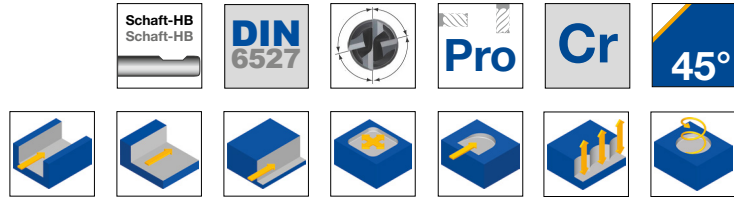
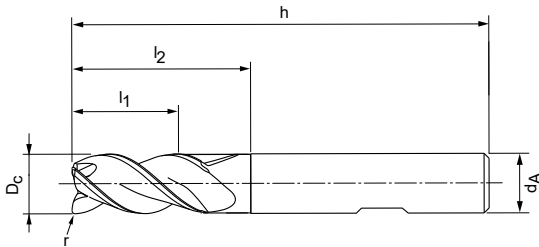
Detailed cutting recommendations, see page 234

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

MULTitec Universal long neck

Lange Ausführung mit Hals Z3

Execution long neck Z3



| Hard Facts | |
|--------------------|--|
| Fräserdurchmesser: | 4,00 - 20,00 mm |
| Beschichtung: | AlCrN PVD |
| Schneidenzahl: | Z = 3 |
| Drallwinkel: | 42° |
| Besonderheiten: | Ungleichteilung, spezielle Stirngeometrie zum Schrägen eintauchen bis max 45°, Ideal für helikales Eintauchen und Tauchfräsen |
| Diameter: | 3.80 - 20.00 mm |
| Coating: | AlCrN PVD |
| Amount/Teeth: | Z = 3 |
| Helix angle: | 42° |
| Special feature: | Unequal division, special geometrical design for ramping in up to max. ramping angled 45°, excellent for helical ramping in and ramp milling |

| MULTitec Universal long neck | | |
|------------------------------|-----|---|
| ISO | | |
| P | P.1 | ■ |
| | P.2 | ■ |
| | P.3 | ■ |
| | P.4 | ■ |
| | P.5 | ■ |
| M | M.1 | ■ |
| | M.2 | ■ |
| K | K.1 | ■ |
| | K.2 | ■ |
| | K.3 | ■ |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|--------|----------------|----------------|------|---|-----------------|
| | | | D _c | d _A | h | l ₁ | l ₂ | r | | |
| MU04.011.057 Cr Z3 HB | 5163032 | ● | 4,00 | 6,00 | 57,00 | 11,00 | 13,00 | 0,20 | 3 | HB |
| MU04.8.011.057 Cr Z3 HB | 5163592 | ○ | 4,80 | 6,00 | 57,00 | 11,00 | 15,50 | 0,24 | 3 | HB |
| MU05.013.057 Cr Z3 HB | 5163033 | ● | 5,00 | 6,00 | 57,00 | 13,00 | 15,50 | 0,25 | 3 | HB |
| MU05.7.013.057 Cr Z3 HB | 5163595 | ○ | 5,70 | 6,00 | 57,00 | 13,00 | 19,00 | 0,29 | 3 | HB |
| MU06.013.057 Cr Z3 HB | 5163034 | ● | 6,00 | 6,00 | 57,00 | 13,00 | 19,00 | 0,30 | 3 | HB |
| MU06.7.016.063 Cr Z3 HB | 5163596 | ○ | 6,70 | 8,00 | 63,00 | 16,00 | 25,00 | 0,34 | 3 | HB |
| MU07.016.063 Cr Z3 HB | 5163597 | ○ | 7,00 | 8,00 | 63,00 | 16,00 | 25,00 | 0,35 | 3 | HB |
| MU07.7.019.063 Cr Z3 HB | 5163599 | ○ | 7,70 | 8,00 | 63,00 | 19,00 | 25,00 | 0,39 | 3 | HB |
| MU08.019.063 Cr Z3 HB | 5163035 | ● | 8,00 | 8,00 | 63,00 | 19,00 | 25,00 | 0,40 | 3 | HB |
| MU08.7.022.072 Cr Z3 HB | 5163603 | ○ | 8,70 | 10,00 | 72,00 | 22,00 | 30,00 | 0,44 | 3 | HB |
| MU09.022.072 Cr Z3 HB | 5163604 | ○ | 9,00 | 10,00 | 72,00 | 22,00 | 30,00 | 0,45 | 3 | HB |
| MU09.7.022.072 Cr Z3 HB | 5163605 | ○ | 9,70 | 10,00 | 72,00 | 22,00 | 30,00 | 0,49 | 3 | HB |
| MU10.022.072 Cr Z3 HB | 5163036 | ● | 10,00 | 10,00 | 72,00 | 22,00 | 30,00 | 0,50 | 3 | HB |
| MU11.7.026.083 Cr Z3 HB | 5163609 | ○ | 11,70 | 12,00 | 83,00 | 26,00 | 36,00 | 0,59 | 3 | HB |
| MU12.026.083 Cr Z3 HB | 5163037 | ● | 12,00 | 12,00 | 83,00 | 26,00 | 36,00 | 0,60 | 3 | HB |
| MU13.7.026.083 Cr Z3 HB | 5163610 | ○ | 13,70 | 14,00 | 83,00 | 26,00 | 36,00 | 0,69 | 3 | HB |
| MU14.026.083 Cr Z3 HB | 5163611 | ○ | 14,00 | 14,00 | 83,00 | 26,00 | 36,00 | 0,70 | 3 | HB |
| MU15.5.031.092 Cr Z3 HB | 5163612 | ○ | 15,50 | 16,00 | 92,00 | 31,00 | 42,00 | 0,78 | 3 | HB |
| MU16.031.092 Cr Z3 HB | 5163039 | ● | 16,00 | 16,00 | 92,00 | 31,00 | 42,00 | 0,80 | 3 | HB |
| MU17.5.031.092 Cr Z3 HB | 5163613 | ○ | 17,50 | 18,00 | 92,00 | 31,00 | 42,00 | 0,88 | 3 | HB |
| MU18.031.092 Cr Z3 HB | 5163614 | ○ | 18,00 | 18,00 | 92,00 | 31,00 | 42,00 | 0,90 | 3 | HB |
| MU19.5.041.104 Cr Z3 HB | 5163615 | ○ | 19,50 | 20,00 | 104,00 | 41,00 | 52,00 | 0,98 | 3 | HB |
| MU20.041.104 Cr Z3 HB | 5163618 | ○ | 20,00 | 20,00 | 104,00 | 41,00 | 52,00 | 1,00 | 3 | HB |

Bestellbeispiel Order example: 1 Stück piece 5163032 oder or MU04.011.057 Cr Z3 HB

Genauere Schnittwertempfehlung siehe Seite 234

Detailed cutting recommendations, see page 234

● Verfügbar ab Lager Available from stock

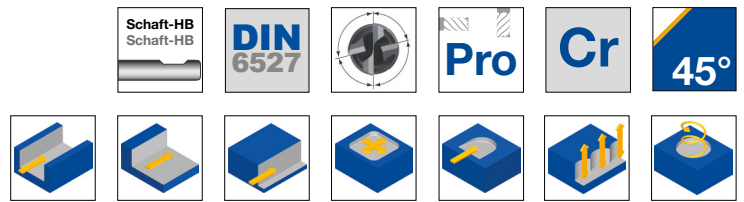
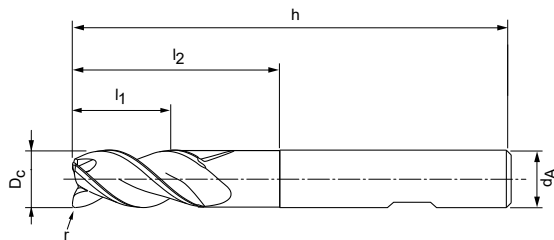
○ Kurzfristig lieferbar Shortly available

○ Lieferzeit auf Anfrage Delivery time on request

MULTItec Universal overlength neck

Überlange Ausführung mit Hals Z3

Execution overlength neck Z3



| Hard Facts | |
|--------------------|--|
| Fräserdurchmesser: | 5,00 - 20,00 mm |
| Beschichtung: | AlCrN PVD |
| Schneidenzahl: | Z = 3 |
| Drallwinkel: | 42° |
| Besonderheiten: | Ungleichteilung, spezielle Stirngeometrie zum Schrägen eintauchen bis max 45°, Ideal für helikales Eintauchen und Tauchfräsen |
| Diameter: | 5.00 - 20.00 mm |
| Coating: | AlCrN PVD |
| Amount/Teeth: | Z = 3 |
| Helix angle: | 42° |
| Special feature: | Unequal division, special geometrical design for ramping in up to max. ramping angled 45°, excellent for helical ramping in and ramp milling |

| MULTItec Universal overlength neck | | |
|------------------------------------|-----|---|
| ISO | | |
| P | P.1 | ■ |
| | P.2 | ■ |
| | P.3 | ■ |
| | P.4 | ■ |
| | P.5 | ■ |
| M | M.1 | ■ |
| | M.2 | ■ |
| K | K.1 | ■ |
| | K.2 | ■ |
| | K.3 | ■ |

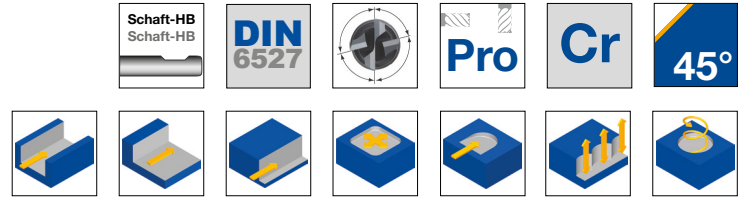
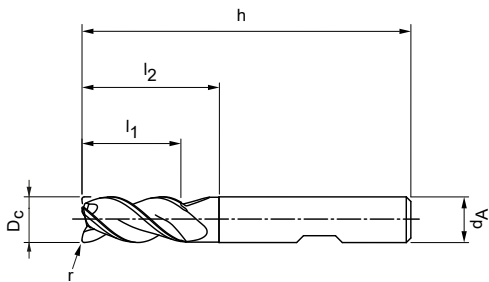
| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|--------|----------------|----------------|------|---|-----------------|
| | | | D _C | d _A | h | l ₁ | l ₂ | r | | |
| MU05.013.062 Cr Z3 HB | 5163621 | ○ | 5,00 | 6,00 | 62,00 | 13,00 | 24,00 | 0,25 | 3 | HB |
| MU05.7.013.062 Cr Z3 HB | 5163634 | ● | 5,70 | 6,00 | 62,00 | 13,00 | 24,00 | 0,29 | 3 | HB |
| MU06.013.062 Cr Z3 HB | 5163636 | ● | 6,00 | 6,00 | 62,00 | 13,00 | 24,00 | 0,30 | 3 | HB |
| MU06.7.016.068 Cr Z3 HB | 5163637 | ● | 6,70 | 8,00 | 68,00 | 16,00 | 30,00 | 0,34 | 3 | HB |
| MU07.016.068 Cr Z3 HB | 5163638 | ● | 7,00 | 8,00 | 68,00 | 16,00 | 30,00 | 0,35 | 3 | HB |
| MU07.7.021.068 Cr Z3 HB | 5163639 | ● | 7,70 | 8,00 | 68,00 | 21,00 | 30,00 | 0,39 | 3 | HB |
| MU08.021.068 Cr Z3 HB | 5163641 | ● | 8,00 | 8,00 | 68,00 | 21,00 | 30,00 | 0,40 | 3 | HB |
| MU08.7.022.080 Cr Z3 HB | 5163642 | ● | 8,70 | 10,00 | 80,00 | 22,00 | 38,00 | 0,44 | 3 | HB |
| MU09.022.080 Cr Z3 HB | 5163643 | ● | 9,00 | 10,00 | 80,00 | 22,00 | 38,00 | 0,45 | 3 | HB |
| MU09.7.022.080 Cr Z3 HB | 5163644 | ● | 9,70 | 10,00 | 80,00 | 22,00 | 38,00 | 0,49 | 3 | HB |
| MU10.022.080 Cr Z3 HB | 5163646 | ● | 10,00 | 10,00 | 80,00 | 22,00 | 38,00 | 0,50 | 3 | HB |
| MU11.7.026.093 Cr Z3 HB | 5163648 | ● | 11,70 | 12,00 | 93,00 | 26,00 | 46,00 | 0,59 | 3 | HB |
| MU12.026.093 Cr Z3 HB | 5163655 | ● | 12,00 | 12,00 | 93,00 | 26,00 | 46,00 | 0,60 | 3 | HB |
| MU13.7.026.099 Cr Z3 HB | 5163658 | ● | 13,70 | 14,00 | 99,00 | 26,00 | 52,00 | 0,69 | 3 | HB |
| MU14.026.099 Cr Z3 HB | 5163659 | ● | 14,00 | 14,00 | 99,00 | 26,00 | 52,00 | 0,70 | 3 | HB |
| MU15.5.036.108 Cr Z3 HB | 5163660 | ● | 15,50 | 16,00 | 108,00 | 36,00 | 58,00 | 0,78 | 3 | HB |
| MU16.036.108 Cr Z3 HB | 5163661 | ● | 16,00 | 16,00 | 108,00 | 36,00 | 58,00 | 0,80 | 3 | HB |
| MU17.5.036.117 Cr Z3 HB | 5163662 | ● | 17,50 | 18,00 | 117,00 | 36,00 | 67,00 | 0,88 | 3 | HB |
| MU18.036.117 Cr Z3 HB | 5163663 | ● | 18,00 | 18,00 | 117,00 | 36,00 | 67,00 | 0,90 | 3 | HB |
| MU19.5.041.126 Cr Z3 HB | 5163664 | ● | 19,50 | 20,00 | 126,00 | 41,00 | 74,00 | 0,98 | 3 | HB |
| MU20.041.126 Cr Z3 HB | 5163665 | ● | 20,00 | 20,00 | 126,00 | 41,00 | 74,00 | 1,00 | 3 | HB |

Bestellbeispiel Order example: 1 Stück piece 5163621 oder or MU05.013.062 Cr Z3 HB
 Genaue Schnittwertempfehlung siehe Seite 234
 Detailed cutting recommendations, see page 234

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

MULTitec N long neck

Lange Ausführung mit Hals Z3
Execution long neck Z3



| Hard Facts | |
|--------------------|--|
| Fräserdurchmesser: | 5,00 - 20,00 mm |
| Beschichtung: | Ti+C PVD |
| Schneidenzahl: | Z = 3 |
| Drallwinkel: | 42° |
| Besonderheiten: | Ungleichteilung, spezielle Stirngeometrie zum Schrägen eintauchen bis max 45°, Ideal für helikales Eintauchen und Tauchfräsen |
| Diameter: | 5.00 - 20.00 mm |
| Coating: | Ti+C PVD |
| Amount/Teeth: | Z = 3 |
| Helix angle: | 42° |
| Special feature: | Unequal division, special geometrical design for ramping in up to max. ramping angled 45°, excellent for helical ramping in and ramp milling |

| MULTitec N long neck | | |
|----------------------|-----|---|
| ISO | | |
| N | N.1 | ■ |
| | N.2 | ■ |
| | N.3 | ■ |
| | N.4 | □ |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|--------|----------------|----------------|------|---|-----------------|
| | | | D _c | d _A | h | l ₁ | l ₂ | r | | |
| MUN05.013.057 Cr Z3 HB | 5163044 | ● | 5,00 | 6,00 | 57,00 | 13,00 | 15,50 | 0,20 | 3 | HB |
| MUN05.7.013.057 Cr Z3 HB | 5163672 | ○ | 5,70 | 6,00 | 57,00 | 13,00 | 19,00 | 0,20 | 3 | HB |
| MUN06.013.057 Cr Z3 HB | 5163047 | ● | 6,00 | 6,00 | 57,00 | 13,00 | 19,00 | 0,20 | 3 | HB |
| MUN06.7.016.063 Cr Z3 HB | 5163674 | ○ | 6,70 | 8,00 | 63,00 | 16,00 | 25,00 | 0,20 | 3 | HB |
| MUN07.016.063 Cr Z3 HB | 5163675 | ○ | 7,00 | 8,00 | 63,00 | 16,00 | 25,00 | 0,20 | 3 | HB |
| MUN07.7.016.063 Cr Z3 HB | 5163676 | ○ | 7,70 | 8,00 | 63,00 | 16,00 | 25,00 | 0,20 | 3 | HB |
| MUN08.019.063 Cr Z3 HB | 5163048 | ● | 8,00 | 8,00 | 63,00 | 19,00 | 25,00 | 0,20 | 3 | HB |
| MUN08.7.022.072 Cr Z3 HB | 5163677 | ○ | 8,70 | 10,00 | 72,00 | 22,00 | 30,00 | 0,32 | 3 | HB |
| MUN09.022.072 Cr Z3 HB | 5163678 | ○ | 9,00 | 10,00 | 72,00 | 22,00 | 30,00 | 0,32 | 3 | HB |
| MUN09.7.022.072 Cr Z3 HB | 5163681 | ○ | 9,70 | 10,00 | 72,00 | 22,00 | 30,00 | 0,32 | 3 | HB |
| MUN10.022.072 Cr Z3 HB | 5163053 | ● | 10,00 | 10,00 | 72,00 | 22,00 | 30,00 | 0,32 | 3 | HB |
| MUN11.7.026.083 Cr Z3 HB | 5163683 | ○ | 11,70 | 12,00 | 83,00 | 26,00 | 36,00 | 0,32 | 3 | HB |
| MUN12.026.083 Cr Z3 HB | 5163054 | ● | 12,00 | 12,00 | 83,00 | 26,00 | 36,00 | 0,32 | 3 | HB |
| MUN13.7.026.083 Cr Z3 HB | 5163684 | ○ | 13,70 | 14,00 | 83,00 | 26,00 | 36,00 | 0,32 | 3 | HB |
| MUN14.026.083 Cr Z3 HB | 5163685 | ○ | 14,00 | 14,00 | 83,00 | 26,00 | 36,00 | 0,32 | 3 | HB |
| MUN15.5.031.092 Cr Z3 HB | 5163686 | ○ | 15,50 | 16,00 | 92,00 | 31,00 | 42,00 | 0,32 | 3 | HB |
| MUN16.031.092 Cr Z3 HB | 5163061 | ● | 16,00 | 16,00 | 92,00 | 31,00 | 42,00 | 0,32 | 3 | HB |
| MUN17.5.031.092 Cr Z3 HB | 5163687 | ○ | 17,50 | 18,00 | 92,00 | 31,00 | 42,00 | 0,32 | 3 | HB |
| MUN18.031.092 Cr Z3 HB | 5163688 | ○ | 18,00 | 18,00 | 92,00 | 31,00 | 42,00 | 0,32 | 3 | HB |
| MUN19.5.041.104 Cr Z3 HB | 5163689 | ○ | 19,50 | 20,00 | 104,00 | 41,00 | 52,00 | 0,50 | 3 | HB |
| MUN20.041.104 Cr Z3 HB | 5163692 | ● | 20,00 | 20,00 | 104,00 | 41,00 | 52,00 | 0,50 | 3 | HB |

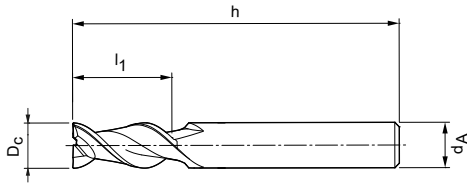
Bestellbeispiel Order example: 1 Stück piece 5163044 oder or MUN05.013.057 Cr Z3 HB
 Genaue Schnittwertempfehlung siehe Seite 236
 Detailed cutting recommendations, see page 236

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

UNitec N long

Lange Ausführung Z2

Execution long Z2



| Hard Facts | |
|--------------------|-----------------|
| Fräserdurchmesser: | 2,00 - 20,00 mm |
| Beschichtung: | unbeschichtet |
| Schneidenzahl: | Z = 2 |
| Drallwinkel: | 45° |
| Diameter: | 2.00 - 20.00 mm |
| Coating: | uncoated |
| Amount/Teeth: | Z = 2 |
| Helix angle: | 45° |

| UNitec N long | | |
|---------------|-----|---|
| ISO | | |
| N | N.1 | ■ |
| | N.2 | ■ |
| | N.3 | ■ |
| | N.4 | □ |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|--------|----------------|---------|---|-----------------|
| | | | D _c | d _A | h | l ₁ | C x 45° | | |
| UN02.006.057 Cx Z2 HA | 5162916 | ● | 2,00 | 6,00 | 57,00 | 6,00 | 0,03 | 2 | HA |
| UN03.007.057 Cx Z2 HA | 5162918 | ● | 3,00 | 6,00 | 57,00 | 8,00 | 0,05 | 2 | HA |
| UN04.008.057 Cx Z2 HA | 5162919 | ● | 4,00 | 6,00 | 57,00 | 11,00 | 0,06 | 2 | HA |
| UN05.010.057 Cx Z2 HA | 5162925 | ● | 5,00 | 6,00 | 57,00 | 13,00 | 0,08 | 2 | HA |
| UN06.010.057 Cx Z2 HA | 5162926 | ● | 6,00 | 6,00 | 57,00 | 13,00 | 0,09 | 2 | HA |
| UN08.016.063 Cx Z2 HA | 5162928 | ● | 8,00 | 8,00 | 63,00 | 19,00 | 0,12 | 2 | HA |
| UN10.019.072 Cx Z2 HA | 5162929 | ● | 10,00 | 10,00 | 72,00 | 22,00 | 0,15 | 2 | HA |
| UN12.022.083 Cx Z2 HA | 5162930 | ● | 12,00 | 12,00 | 83,00 | 26,00 | 0,18 | 2 | HA |
| UN16.026.092 Cx Z2 HA | 5162933 | ● | 16,00 | 16,00 | 92,00 | 32,00 | 0,24 | 2 | HA |
| UN20.032.104 Cx Z2 HA | 5162934 | ● | 20,00 | 20,00 | 104,00 | 38,00 | 0,30 | 2 | HA |

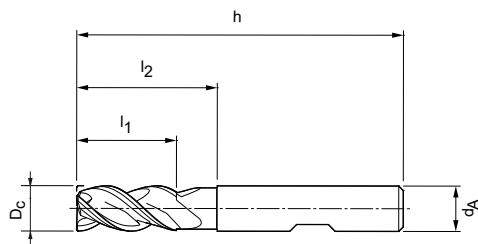
Bestellbeispiel Order example: 1 Stück piece 5162916 oder or UN02.006.057 Cx Z2 HA
 Genaue Schnittwertempfehlung siehe Seite 236
 Detailed cutting recommendations, see page 236

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

UNItec Pro N long neck

Lange Ausführung mit Hals Z3

Execution long neck Z3



| Hard Facts | |
|--------------------|--------------------------------|
| Fräserdurchmesser: | 3,00 - 20,00 mm |
| Beschichtung: | unbeschichtet |
| Schneidenzahl: | Z = 3 |
| Drallwinkel: | 42°-43° |
| Besonderheiten: | Ungleichteilung, Nuten poliert |
| Diameter: | 3.00 - 20.00 mm |
| Coating: | uncoated |
| Amount/Teeth: | Z = 3 |
| Helix angle: | 42°-43° |
| Special feature: | unequal deivision, polished |

| UNItec Pro N long neck | | |
|------------------------|-----|---|
| ISO | | |
| N | N.1 | ■ |
| | N.2 | ■ |
| | N.3 | ■ |
| | N.4 | □ |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|--------|----------------|----------------|--------|---|----|-----------------|
| | | | D _C | d _A | h | l ₁ | l ₂ | Cx 45° | | | |
| UPN03.007.057 Cx Z3 HB | 5163004 | ● | *3,00 | 6,00 | 57,00 | 7,00 | – | 0,06 | 3 | HB | |
| UPN04.008.057 Cx Z3 HB | 5163005 | ● | *4,00 | 6,00 | 57,00 | 8,00 | – | 0,08 | 3 | HB | |
| UPN05.010.057 Cx Z3 HB | 5163009 | ● | *5,00 | 6,00 | 57,00 | 10,00 | – | 0,10 | 3 | HB | |
| UPN06.010.057 Cx Z3 HB | 5163011 | ● | 6,00 | 6,00 | 57,00 | 10,00 | 18,00 | 0,12 | 3 | HB | |
| UPN08.016.063 Cx Z3 HB | 5163014 | ● | 8,00 | 8,00 | 63,00 | 16,00 | 25,00 | 0,16 | 3 | HB | |
| UPN10.019.072 Cx Z3 HB | 5163024 | ● | 10,00 | 10,00 | 72,00 | 19,00 | 30,00 | 0,20 | 3 | HB | |
| UPN12.022.083 Cx Z3 HB | 5163029 | ● | 12,00 | 12,00 | 83,00 | 22,00 | 36,00 | 0,24 | 3 | HB | |
| UPN14.022.083 Cx Z3 HB | 5163222 | ○ | 14,00 | 14,00 | 83,00 | 22,00 | 36,00 | 0,28 | 3 | HB | |
| UPN16.026.092 Cx Z3 HB | 5163030 | ● | 16,00 | 16,00 | 92,00 | 26,00 | 42,00 | 0,32 | 3 | HB | |
| UPN18.026.092 Cx Z3 HB | 5163224 | ○ | 18,00 | 18,00 | 92,00 | 26,00 | 42,00 | 0,36 | 3 | HB | |
| UPN20.032.104 Cx Z3 HB | 5163225 | ⦿ | 20,00 | 20,00 | 104,00 | 32,00 | 52,00 | 0,40 | 3 | HB | |

Bestellbeispiel Order example: 1 Stück piece 5163004 oder or UPN03.007.057 Cx Z3 HB

Genaue Schnittwertempfehlung siehe Seite 236

Detailed cutting recommendations, see page 236

* Ausführung ohne Hals

* Version without neck

● Verfügbar ab Lager Available from stock

⦿ Kurzfristig lieferbar Shortly available

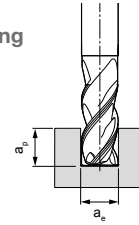
○ Lieferzeit auf Anfrage Delivery time on request

Schnittwertempfehlung für Eckfräser, Vorschub und Schnittgeschwindigkeit
Recommended cutting values for corner milling cutters, feed and cutting speed

**UNitec short Z2/Z3, long Z2/Z3, extra long Z3
 long neck Z3**

| Werkzeuglänge/ Korrekturfaktor: Tool length/Correction factor: | |
|---|---------------|
| Länge Length | f_z & v_c |
| kurz short | 1 |
| lang long | 0,9 |
| überlang extra long | 0,8 |
| extra lang ultra long | 0,6 |

Nutfräsen
 Groove milling



$$a_p = 1 \times D$$

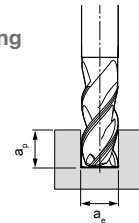
$$a_e = 1 \times D$$

| BZG | Kühlung Cooling | | | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | | | |
|-----|---------------------|----------------|-------------|------------------|---|-------|-------|-------|-------|-------|-------|-------|-------|
| | MMS/Luft MMS/Air | Trocken Dry | Nass Wet | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | |
| | | | | | 2 | 4 | 6 | 8 | 10 | 12 | 16 | 20 | |
| P | P1 | ● | ● | ● | 115 - 140 | 0,010 | 0,018 | 0,026 | 0,034 | 0,041 | 0,048 | 0,060 | 0,069 |
| | P2 | ● | ● | ● | 90 - 125 | 0,010 | 0,018 | 0,026 | 0,034 | 0,041 | 0,048 | 0,060 | 0,069 |
| | P3 | ● | ● | ● | 70 - 80 | 0,010 | 0,018 | 0,025 | 0,032 | 0,039 | 0,045 | 0,057 | 0,066 |
| | P4 | ● | | ● | 55 | 0,007 | 0,012 | 0,018 | 0,023 | 0,027 | 0,032 | 0,040 | 0,046 |
| | P5 | | | ● | 55 - 85 | 0,010 | 0,018 | 0,025 | 0,033 | 0,040 | 0,046 | 0,058 | 0,067 |
| M | M1 | ● | | ● | 40 | 0,006 | 0,011 | 0,015 | 0,020 | 0,024 | 0,028 | 0,035 | 0,040 |
| | M2 | | | ● | 35 - 40 | 0,005 | 0,009 | 0,013 | 0,016 | 0,020 | 0,023 | 0,029 | 0,033 |
| K | K1 | ● | ● | ● | 150 | 0,017 | 0,031 | 0,044 | 0,056 | 0,068 | 0,080 | 0,100 | 0,115 |
| | K2 | ● | ● | ● | 65 - 140 | 0,015 | 0,026 | 0,037 | 0,048 | 0,058 | 0,068 | 0,085 | 0,098 |
| | K3 | ● | ● | ● | 95 - 100 | 0,012 | 0,022 | 0,031 | 0,039 | 0,048 | 0,056 | 0,070 | 0,081 |
| N | N1 | ● | ● | ● | 525 | 0,017 | 0,031 | 0,044 | 0,056 | 0,068 | 0,080 | 0,100 | 0,115 |
| | N3 | ● | ● | ● | 200 - 350 | 0,018 | 0,032 | 0,046 | 0,059 | 0,072 | 0,084 | 0,105 | 0,121 |
| | N2 | ● | ● | ● | 150 - 250 | 0,014 | 0,025 | 0,035 | 0,045 | 0,055 | 0,064 | 0,080 | 0,092 |

UNitec short Z4, Unitec long Z4

| Werkzeuglänge/ Korrekturfaktor: Tool length/Correction factor: | |
|---|---------------|
| Länge Length | f_z & v_c |
| kurz short | 1 |
| lang long | 0,9 |
| überlang extra long | 0,8 |
| extra lang ultra long | 0,6 |

Nutfräsen
 Groove milling

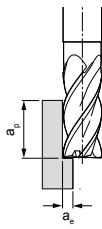


$$a_p = 1 \times D$$

$$a_e = 1 \times D$$

| BZG | Kühlung Cooling | | | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | | | |
|-----|---------------------|----------------|-------------|------------------|---|-------|-------|-------|-------|-------|-------|-------|-------|
| | MMS/Luft MMS/Air | Trocken Dry | Nass Wet | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | |
| | | | | | 2 | 4 | 6 | 8 | 10 | 12 | 16 | 20 | |
| P | P1 | ● | ● | ● | 140 - 170 | 0,012 | 0,021 | 0,030 | 0,038 | 0,046 | 0,054 | 0,067 | 0,078 |
| | P2 | ● | ● | ● | 105 - 155 | 0,012 | 0,021 | 0,030 | 0,038 | 0,046 | 0,054 | 0,067 | 0,078 |
| | P3 | ● | ● | ● | 85 - 100 | 0,011 | 0,020 | 0,028 | 0,036 | 0,044 | 0,051 | 0,064 | 0,074 |
| | P4 | ● | | ● | 70 | 0,008 | 0,014 | 0,020 | 0,025 | 0,031 | 0,036 | 0,045 | 0,052 |
| | P5 | | | ● | 70 - 105 | 0,011 | 0,020 | 0,029 | 0,037 | 0,045 | 0,052 | 0,065 | 0,075 |
| M | M1 | ● | | ● | 45 - 50 | 0,007 | 0,012 | 0,017 | 0,022 | 0,027 | 0,031 | 0,039 | 0,045 |
| | M2 | | | ● | 45 | 0,006 | 0,010 | 0,014 | 0,018 | 0,022 | 0,026 | 0,033 | 0,038 |
| K | K1 | ● | ● | ● | 185 | 0,020 | 0,035 | 0,049 | 0,063 | 0,077 | 0,090 | 0,112 | 0,130 |
| | K2 | ● | ● | ● | 75 - 170 | 0,017 | 0,029 | 0,042 | 0,054 | 0,065 | 0,076 | 0,095 | 0,110 |
| | K3 | ● | ● | ● | 115 - 120 | 0,014 | 0,024 | 0,034 | 0,044 | 0,054 | 0,063 | 0,078 | 0,091 |

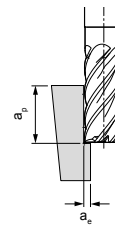
Schruppen
Roughing



$$a_p = 1,5 \times D$$

$$a_e = 0,25 \times D$$

Schlichten
Finishing

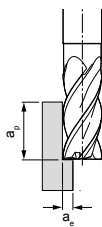


$$a_p = 1,5 \times D$$

$$a_e = 0,1 \times D$$

| | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | | | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | | |
|------------------|------------------|---|-------|-------|-------|-------|-------|-------|-------------------|------------------|---|-------|-------|-------|-------|-------|-------|----|
| | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | |
| | | 2 | 4 | 6 | 8 | 10 | 12 | 16 | 20 | | 2 | 4 | 6 | 8 | 10 | 12 | 16 | 20 |
| 230 - 285 | 0,018 | 0,031 | 0,045 | 0,057 | 0,070 | 0,081 | 0,101 | 0,118 | 340 - 415 | 0,028 | 0,050 | 0,070 | 0,091 | 0,110 | 0,128 | 0,160 | 0,186 | |
| 180 - 260 | 0,018 | 0,031 | 0,045 | 0,057 | 0,070 | 0,081 | 0,101 | 0,118 | 265 - 380 | 0,028 | 0,050 | 0,070 | 0,091 | 0,110 | 0,128 | 0,160 | 0,186 | |
| 140 - 165 | 0,017 | 0,030 | 0,042 | 0,054 | 0,066 | 0,077 | 0,096 | 0,112 | 210 - 245 | 0,027 | 0,047 | 0,067 | 0,086 | 0,104 | 0,122 | 0,152 | 0,177 | |
| 115 | 0,012 | 0,021 | 0,030 | 0,038 | 0,046 | 0,054 | 0,068 | 0,078 | 170 | 0,019 | 0,033 | 0,047 | 0,060 | 0,073 | 0,085 | 0,107 | 0,124 | |
| 115 - 175 | 0,017 | 0,030 | 0,043 | 0,055 | 0,067 | 0,078 | 0,098 | 0,114 | 170 - 255 | 0,027 | 0,048 | 0,068 | 0,088 | 0,106 | 0,124 | 0,155 | 0,180 | |
| 75 - 85 | 0,010 | 0,018 | 0,026 | 0,033 | 0,041 | 0,047 | 0,059 | 0,069 | 115 - 125 | 0,016 | 0,029 | 0,041 | 0,053 | 0,064 | 0,075 | 0,094 | 0,108 | |
| 70 - 75 | 0,009 | 0,015 | 0,022 | 0,028 | 0,034 | 0,039 | 0,049 | 0,057 | 105 - 115 | 0,014 | 0,024 | 0,034 | 0,044 | 0,053 | 0,062 | 0,077 | 0,090 | |
| 310 | 0,030 | 0,052 | 0,074 | 0,096 | 0,116 | 0,135 | 0,169 | 0,196 | 455 | 0,047 | 0,083 | 0,117 | 0,151 | 0,183 | 0,214 | 0,267 | 0,310 | |
| 130 - 285 | 0,025 | 0,044 | 0,063 | 0,081 | 0,099 | 0,115 | 0,144 | 0,166 | 190 - 415 | 0,040 | 0,070 | 0,100 | 0,128 | 0,156 | 0,182 | 0,227 | 0,263 | |
| 205 - 195 | 0,021 | 0,037 | 0,052 | 0,067 | 0,081 | 0,095 | 0,118 | 0,137 | 285 - 300 | 0,033 | 0,058 | 0,082 | 0,106 | 0,128 | 0,149 | 0,187 | 0,217 | |
| 1075 | 0,030 | 0,052 | 0,074 | 0,096 | 0,116 | 0,135 | 0,169 | 0,196 | 1580 | 0,047 | 0,083 | 0,117 | 0,151 | 0,183 | 0,214 | 0,267 | 0,310 | |
| 410 - 715 | 0,031 | 0,055 | 0,078 | 0,100 | 0,122 | 0,142 | 0,177 | 0,206 | 605 - 1050 | 0,049 | 0,087 | 0,123 | 0,159 | 0,192 | 0,224 | 0,281 | 0,325 | |
| 310 - 515 | 0,024 | 0,042 | 0,059 | 0,076 | 0,093 | 0,108 | 0,135 | 0,157 | 455 - 755 | 0,037 | 0,066 | 0,094 | 0,121 | 0,147 | 0,171 | 0,214 | 0,248 | |

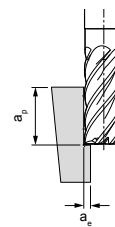
Schruppen
Roughing



$$a_p = 1,5 \times D$$

$$a_e = 0,25 \times D$$

Schlichten
Finishing



$$a_p = 1,5 \times D$$

$$a_e = 0,1 \times D$$

| | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | | | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | | |
|------------------|------------------|---|-------|-------|-------|-------|-------|-------|------------------|------------------|---|-------|-------|-------|-------|-------|-------|----|
| | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | |
| | | 2 | 4 | 6 | 8 | 10 | 12 | 16 | 20 | | 2 | 4 | 6 | 8 | 10 | 12 | 16 | 20 |
| 280 - 345 | 0,020 | 0,035 | 0,050 | 0,065 | 0,078 | 0,091 | 0,114 | 0,132 | 415 - 505 | 0,031 | 0,056 | 0,079 | 0,102 | 0,124 | 0,144 | 0,180 | 0,209 | |
| 220 - 315 | 0,020 | 0,035 | 0,050 | 0,065 | 0,078 | 0,091 | 0,114 | 0,132 | 320 - 460 | 0,031 | 0,056 | 0,079 | 0,102 | 0,124 | 0,144 | 0,180 | 0,209 | |
| 170 - 205 | 0,019 | 0,033 | 0,048 | 0,061 | 0,074 | 0,087 | 0,108 | 0,126 | 250 - 300 | 0,030 | 0,053 | 0,075 | 0,097 | 0,118 | 0,137 | 0,171 | 0,199 | |
| 140 | 0,013 | 0,023 | 0,033 | 0,043 | 0,052 | 0,061 | 0,076 | 0,088 | 205 | 0,021 | 0,037 | 0,053 | 0,068 | 0,082 | 0,096 | 0,120 | 0,139 | |
| 140 - 210 | 0,019 | 0,034 | 0,048 | 0,062 | 0,076 | 0,088 | 0,110 | 0,128 | 205 - 310 | 0,030 | 0,054 | 0,077 | 0,099 | 0,120 | 0,139 | 0,174 | 0,202 | |
| 95 - 105 | 0,012 | 0,021 | 0,029 | 0,038 | 0,046 | 0,053 | 0,067 | 0,077 | 140 - 150 | 0,018 | 0,032 | 0,046 | 0,060 | 0,072 | 0,084 | 0,105 | 0,122 | |
| 90 - 95 | 0,010 | 0,017 | 0,024 | 0,031 | 0,038 | 0,044 | 0,055 | 0,064 | 130 - 140 | 0,015 | 0,027 | 0,038 | 0,049 | 0,060 | 0,070 | 0,087 | 0,101 | |
| 375 | 0,033 | 0,059 | 0,084 | 0,108 | 0,130 | 0,152 | 0,190 | 0,220 | 550 | 0,052 | 0,093 | 0,132 | 0,170 | 0,206 | 0,24 | 0,301 | 0,348 | |
| 155 - 345 | 0,028 | 0,050 | 0,071 | 0,091 | 0,111 | 0,129 | 0,162 | 0,187 | 230 - 505 | 0,045 | 0,079 | 0,112 | 0,145 | 0,175 | 0,204 | 0,256 | 0,296 | |
| 235 - 250 | 0,023 | 0,041 | 0,059 | 0,075 | 0,091 | 0,106 | 0,133 | 0,154 | 345 - 365 | 0,037 | 0,065 | 0,092 | 0,119 | 0,144 | 0,168 | 0,210 | 0,244 | |

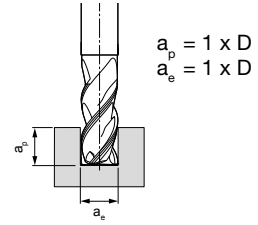
* Angegebene Schnittdaten sind als Richtwert zu sehen, welche durch Versuche für jeden Anwendungsfall separat optimiert werden.
 * Recommended cutting data has to be seen as a reference which can be optimised for each application through trials separately

Schnittwertempfehlung für Eckfräser, Vorschub und Schnittgeschwindigkeit
 Recommended cutting values for corner milling cutters, feed and cutting speed

UNitec Pro slot long neck Z3

| Werkzeublänge/ Korrekturfaktor: Tool length/Correction factor: | |
|---|---------------|
| Länge Length | f_z & v_c |
| kurz short | 1 |
| lang long | 0,9 |
| überlang extra long | 0,8 |
| extra lang ultra long | 0,6 |

Nutfräsen
 Groove milling

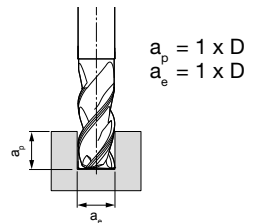


| BZG | Kühlung Cooling | | | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | | |
|-----|---------------------|----------------|-------------|------------------|---|-------|-------|-------|-------|-------|-------|-------|
| | MMS/Luft MMS/Air | Trocken Dry | Nass Wet | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | |
| | | | | | 2 | 4 | 6 | 8 | 10 | 12 | 16 | 20 |
| P1 | ● | ● | ● | 160 - 200 | 0,013 | 0,023 | 0,033 | 0,042 | 0,051 | 0,060 | 0,075 | 0,087 |
| P2 | ● | ● | ● | 125 - 180 | 0,013 | 0,023 | 0,033 | 0,042 | 0,051 | 0,060 | 0,075 | 0,087 |
| P3 | ● | ● | ● | 100 - 115 | 0,012 | 0,022 | 0,031 | 0,040 | 0,049 | 0,057 | 0,071 | 0,082 |
| P4 | ● | | ● | 80 | 0,009 | 0,015 | 0,022 | 0,028 | 0,034 | 0,040 | 0,050 | 0,058 |
| P5 | | | ● | 80 - 120 | 0,013 | 0,022 | 0,032 | 0,041 | 0,050 | 0,058 | 0,072 | 0,084 |
| M1 | ● | | ● | 55 - 60 | 0,008 | 0,013 | 0,019 | 0,025 | 0,030 | 0,035 | 0,044 | 0,051 |
| M2 | | | ● | 50 - 55 | 0,006 | 0,011 | 0,016 | 0,020 | 0,025 | 0,029 | 0,036 | 0,042 |
| K1 | ● | ● | ● | 215 | 0,022 | 0,038 | 0,055 | 0,070 | 0,085 | 0,100 | 0,125 | 0,144 |
| K2 | ● | ● | ● | 90 - 200 | 0,018 | 0,033 | 0,047 | 0,060 | 0,073 | 0,085 | 0,106 | 0,123 |
| K3 | ● | ● | ● | 135 - 145 | 0,015 | 0,027 | 0,038 | 0,049 | 0,060 | 0,070 | 0,087 | 0,101 |

UNitec Pro
 short Z4, long neck Z4, long neck FR Z4,
 overlength neck Z4, extra long neck Z4

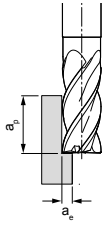
| Werkzeublänge/ Korrekturfaktor: Tool length/Correction factor: | |
|---|---------------|
| Länge Length | f_z & v_c |
| kurz short | 1 |
| lang long | 0,9 |
| überlang extra long | 0,8 |
| extra lang ultra long | 0,6 |

Nutfräsen
 Groove milling



| BZG | Kühlung Cooling | | | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | | |
|-----|---------------------|----------------|-------------|------------------|---|-------|-------|-------|-------|-------|-------|-------|
| | MMS/Luft MMS/Air | Trocken Dry | Nass Wet | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | |
| | | | | | 2 | 4 | 6 | 8 | 10 | 12 | 16 | 20 |
| P1 | ● | ● | ● | 180 - 220 | 0,016 | 0,029 | 0,041 | 0,053 | 0,064 | 0,075 | 0,093 | 0,108 |
| P2 | ● | ● | ● | 140 - 200 | 0,016 | 0,029 | 0,041 | 0,053 | 0,064 | 0,075 | 0,093 | 0,108 |
| P3 | ● | ● | ● | 110 - 130 | 0,015 | 0,027 | 0,039 | 0,050 | 0,061 | 0,071 | 0,089 | 0,103 |
| P4 | ● | | ● | 90 | 0,011 | 0,019 | 0,027 | 0,035 | 0,043 | 0,050 | 0,062 | 0,072 |
| P5 | | | ● | 90 - 135 | 0,016 | 0,028 | 0,040 | 0,051 | 0,062 | 0,072 | 0,090 | 0,105 |
| M1 | ● | | ● | 60 - 65 | 0,010 | 0,017 | 0,024 | 0,031 | 0,037 | 0,044 | 0,054 | 0,063 |
| M2 | | | ● | 55 - 60 | 0,008 | 0,014 | 0,020 | 0,026 | 0,031 | 0,036 | 0,045 | 0,052 |
| K1 | ● | ● | ● | 240 | 0,027 | 0,048 | 0,068 | 0,088 | 0,107 | 0,124 | 0,156 | 0,180 |
| K2 | ● | ● | ● | 100 - 220 | 0,023 | 0,041 | 0,058 | 0,075 | 0,091 | 0,106 | 0,132 | 0,153 |
| K3 | ● | ● | ● | 150 - 160 | 0,019 | 0,034 | 0,048 | 0,062 | 0,075 | 0,087 | 0,109 | 0,126 |

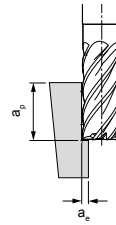
Schruppen
Roughing



$$a_p = 1,5 \times D$$

$$a_e = 0,25 \times D$$

Schlichten
Finishing

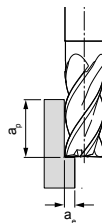


$$a_p = 1,5 \times D$$

$$a_e = 0,1 \times D$$

| | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | | | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | | |
|------------------|------------------|---|-------|-------|-------|-------|-------|-------|------------------|------------------|---|-------|-------|-------|-------|-------|-------|----|
| | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | |
| | | 2 | 4 | 6 | 8 | 10 | 12 | 16 | 20 | | 2 | 4 | 6 | 8 | 10 | 12 | 16 | 20 |
| 330 - 405 | 0,022 | 0,039 | 0,056 | 0,072 | 0,087 | 0,101 | 0,127 | 0,147 | 485 - 595 | 0,035 | 0,062 | 0,088 | 0,113 | 0,137 | 0,160 | 0,200 | 0,232 | |
| 260 - 370 | 0,022 | 0,039 | 0,056 | 0,072 | 0,087 | 0,101 | 0,127 | 0,147 | 380 - 540 | 0,035 | 0,062 | 0,088 | 0,113 | 0,137 | 0,160 | 0,200 | 0,232 | |
| 200 - 240 | 0,021 | 0,037 | 0,053 | 0,068 | 0,083 | 0,096 | 0,120 | 0,140 | 295 - 350 | 0,033 | 0,059 | 0,084 | 0,108 | 0,131 | 0,152 | 0,190 | 0,221 | |
| 165 | 0,015 | 0,026 | 0,037 | 0,048 | 0,058 | 0,068 | 0,085 | 0,098 | 245 | 0,023 | 0,041 | 0,059 | 0,076 | 0,092 | 0,107 | 0,134 | 0,155 | |
| 165 - 245 | 0,021 | 0,038 | 0,054 | 0,069 | 0,084 | 0,098 | 0,123 | 0,142 | 245 - 360 | 0,034 | 0,060 | 0,085 | 0,110 | 0,133 | 0,155 | 0,194 | 0,225 | |
| 110 - 120 | 0,013 | 0,023 | 0,033 | 0,042 | 0,051 | 0,059 | 0,074 | 0,086 | 160 - 180 | 0,020 | 0,036 | 0,051 | 0,066 | 0,080 | 0,093 | 0,117 | 0,135 | |
| 105 - 110 | 0,011 | 0,019 | 0,027 | 0,035 | 0,042 | 0,049 | 0,061 | 0,071 | 150 - 160 | 0,017 | 0,030 | 0,043 | 0,055 | 0,066 | 0,077 | 0,097 | 0,112 | |
| 440 | 0,037 | 0,065 | 0,093 | 0,119 | 0,145 | 0,169 | 0,211 | 0,245 | 650 | 0,058 | 0,103 | 0,147 | 0,189 | 0,229 | 0,267 | 0,334 | 0,387 | |
| 185 - 405 | 0,031 | 0,055 | 0,079 | 0,102 | 0,123 | 0,144 | 0,180 | 0,208 | 270 - 595 | 0,050 | 0,088 | 0,125 | 0,161 | 0,195 | 0,227 | 0,284 | 0,329 | |
| 275 - 295 | 0,026 | 0,046 | 0,065 | 0,084 | 0,101 | 0,118 | 0,148 | 0,171 | 405 - 430 | 0,041 | 0,072 | 0,103 | 0,132 | 0,160 | 0,187 | 0,234 | 0,271 | |

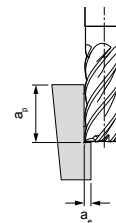
Schruppen
Roughing



$$a_p = 1,5 \times D$$

$$a_e = 0,25 \times D$$

Schlichten
Finishing



$$a_p = 1,5 \times D$$

$$a_e = 0,1 \times D$$

| | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | | | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | | |
|------------------|------------------|---|-------|-------|-------|-------|-------|-------|------------------|------------------|---|-------|-------|-------|-------|-------|-------|----|
| | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | |
| | | 2 | 4 | 6 | 8 | 10 | 12 | 16 | 20 | | 2 | 4 | 6 | 8 | 10 | 12 | 16 | 20 |
| 365 - 445 | 0,028 | 0,049 | 0,070 | 0,090 | 0,109 | 0,127 | 0,158 | 0,184 | 535 - 655 | 0,044 | 0,077 | 0,110 | 0,142 | 0,172 | 0,200 | 0,251 | 0,290 | |
| 285 - 405 | 0,028 | 0,049 | 0,070 | 0,090 | 0,109 | 0,127 | 0,158 | 0,184 | 415 - 595 | 0,044 | 0,077 | 0,110 | 0,142 | 0,172 | 0,200 | 0,251 | 0,290 | |
| 225 - 265 | 0,026 | 0,046 | 0,066 | 0,085 | 0,103 | 0,120 | 0,151 | 0,174 | 325 - 385 | 0,042 | 0,073 | 0,105 | 0,135 | 0,163 | 0,190 | 0,238 | 0,276 | |
| 180 | 0,018 | 0,033 | 0,046 | 0,060 | 0,072 | 0,084 | 0,106 | 0,122 | 265 | 0,029 | 0,052 | 0,073 | 0,094 | 0,115 | 0,133 | 0,167 | 0,194 | |
| 180 - 270 | 0,027 | 0,047 | 0,067 | 0,087 | 0,105 | 0,122 | 0,153 | 0,177 | 265 - 400 | 0,042 | 0,075 | 0,106 | 0,137 | 0,166 | 0,194 | 0,242 | 0,281 | |
| 120 - 135 | 0,016 | 0,029 | 0,041 | 0,052 | 0,063 | 0,074 | 0,092 | 0,107 | 180 - 195 | 0,026 | 0,045 | 0,064 | 0,083 | 0,100 | 0,117 | 0,146 | 0,169 | |
| 115 - 120 | 0,013 | 0,024 | 0,034 | 0,043 | 0,053 | 0,061 | 0,077 | 0,089 | 165 - 180 | 0,021 | 0,037 | 0,053 | 0,068 | 0,083 | 0,097 | 0,121 | 0,140 | |
| 485 | 0,046 | 0,082 | 0,116 | 0,149 | 0,181 | 0,211 | 0,264 | 0,306 | 715 | 0,073 | 0,129 | 0,184 | 0,236 | 0,286 | 0,334 | 0,418 | 0,484 | |
| 200 - 445 | 0,039 | 0,069 | 0,099 | 0,127 | 0,154 | 0,179 | 0,224 | 0,260 | 295 - 655 | 0,062 | 0,110 | 0,156 | 0,201 | 0,243 | 0,284 | 0,355 | 0,411 | |
| 305 - 325 | 0,032 | 0,057 | 0,081 | 0,105 | 0,127 | 0,148 | 0,185 | 0,214 | 445 - 475 | 0,051 | 0,090 | 0,128 | 0,165 | 0,200 | 0,234 | 0,292 | 0,339 | |

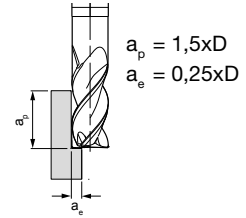
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 * Recommended cutting data has to be seen as a reference which can be optimised for each application through trials separately

Schnittwertempfehlung für Eckfräser, Vorschub und Schnittgeschwindigkeit
Recommended cutting values for corner milling cutters, feed and cutting speed

MULTitec Universal
 short Z3, long neck Z3, overlength neck Z3

| Werkzeuiglänge/ Korrekturfaktor: Tool length/Correction factor: | |
|--|---------------|
| Länge Length | f_z & v_c |
| kurz short | 1 |
| lang long | 1 |
| überlang extra long | 0,8 |
| extra lang ultra long | - |

Teilschnitt
 Partial cut

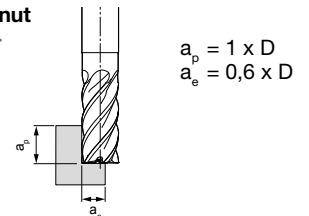


| BZG | | Kühlung Cooling | | | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | |
|-----|----|---------------------|----------------|-------------|------------------|---|-------|-------|-------|-------|-------|
| | | MMS/Luft MMS/Air | Trocken Dry | Nass Wet | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | |
| | | | | | | 6 | 8 | 10 | 12 | 16 | 20 |
| P | P1 | ● | ● | ● | 365 - 445 | 0,070 | 0,090 | 0,109 | 0,127 | 0,158 | 0,184 |
| | P2 | ● | ● | ● | 285 - 405 | 0,070 | 0,090 | 0,109 | 0,127 | 0,158 | 0,184 |
| | P3 | ● | ● | ● | 225 - 265 | 0,066 | 0,085 | 0,103 | 0,120 | 0,151 | 0,174 |
| | P4 | ● | | ● | 180 | 0,046 | 0,060 | 0,072 | 0,084 | 0,106 | 0,122 |
| | P5 | | | ● | 180 - 270 | 0,067 | 0,087 | 0,105 | 0,122 | 0,153 | 0,177 |
| M | M1 | ● | | ● | 120 - 135 | 0,041 | 0,052 | 0,063 | 0,074 | 0,092 | 0,107 |
| | M2 | | | ● | 115 - 120 | 0,034 | 0,043 | 0,053 | 0,061 | 0,077 | 0,089 |
| K | K1 | ● | ● | ● | 485 | 0,116 | 0,149 | 0,181 | 0,211 | 0,264 | 0,306 |
| | K2 | ● | ● | ● | 200 - 445 | 0,099 | 0,127 | 0,154 | 0,179 | 0,224 | 0,260 |
| | K3 | ● | ● | ● | 305 - 325 | 0,081 | 0,105 | 0,127 | 0,148 | 0,185 | 0,214 |

UNItec Pro Silence long neck Z5

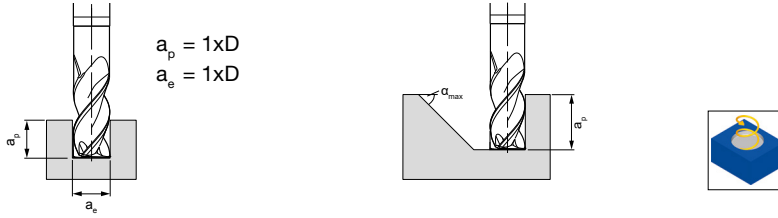
| Werkzeuiglänge/ Korrekturfaktor: Tool length/Correction factor: | |
|--|---------------|
| Länge Length | f_z & v_c |
| kurz short | 1 |
| lang long | 0,9 |
| überlang extra long | 0,8 |
| extra lang ultra long | 0,6 |

Nutfräsen – Teilnut
 Groove milling -
 Partial groove



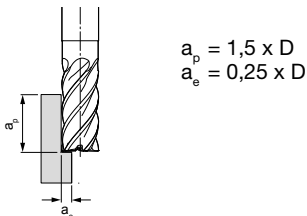
| BZG | | Kühlung Cooling | | | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | | | |
|-----|----|---------------------|----------------|-------------|------------------|---|---|-------|-------|-------|-------|-------|-------|-------|
| | | MMS/Luft MMS/Air | Trocken Dry | Nass Wet | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | |
| | | | | | | 2 | 4 | 6 | 8 | 10 | 12 | 16 | 20 | 25 |
| P | P1 | ● | ● | ● | 190 - 230 | - | - | 0,042 | 0,055 | 0,066 | 0,077 | 0,096 | 0,112 | 0,124 |
| | P2 | ● | ● | ● | 145 - 210 | - | - | 0,042 | 0,055 | 0,066 | 0,077 | 0,096 | 0,112 | 0,124 |
| | P3 | ● | ● | ● | 115 135 | - | - | 0,040 | 0,052 | 0,063 | 0,073 | 0,092 | 0,106 | 0,118 |
| | P4 | ● | | ● | 95 | - | - | 0,028 | 0,036 | 0,044 | 0,051 | 0,064 | 0,075 | 0,083 |
| | P5 | | | ● | 95 - 140 | - | - | 0,041 | 0,053 | 0,064 | 0,075 | 0,093 | 0,108 | 0,120 |
| M | M1 | ● | | ● | 65 - 70 | - | - | 0,025 | 0,032 | 0,039 | 0,045 | 0,056 | 0,065 | 0,072 |
| | M2 | | | ● | 60 - 65 | - | - | 0,020 | 0,026 | 0,032 | 0,037 | 0,047 | 0,054 | 0,06 |
| K | K1 | ● | ● | ● | 250 | - | - | 0,071 | 0,091 | 0,110 | 0,128 | 0,161 | 0,186 | 0,206 |
| | K2 | ● | ● | ● | 105 - 230 | - | - | 0,060 | 0,077 | 0,094 | 0,109 | 0,137 | 0,158 | 0,175 |
| | K3 | ● | ● | ● | 160 - 170 | - | - | 0,049 | 0,064 | 0,077 | 0,090 | 0,113 | 0,130 | 0,144 |

**Vollschnitt
Full cut**

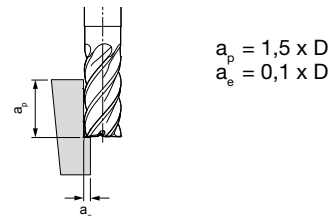


| v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | | Rampen Ramping | Helikales Eintauchen Helikal ramping in | Bohren Drilling |
|------------------|---|-------|-------|-------|-------|-------|-----|--------------------|--|--------------------|
| | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | α_{max} [°] | ap_{max} helix [mm] | f_z Faktor |
| | 6 | 8 | 10 | 12 | 16 | 20 | | | | |
| 180 - 220 | 0,041 | 0,053 | 0,064 | 0,075 | 0,093 | 0,108 | 45° | 0,75xD | 0,90 | |
| 140 - 200 | 0,041 | 0,053 | 0,064 | 0,075 | 0,093 | 0,108 | 45° | 0,75xD | 0,80 | |
| 110 - 130 | 0,039 | 0,050 | 0,061 | 0,071 | 0,089 | 0,103 | 30° | 0,5xD | 0,80 | |
| 90 | 0,027 | 0,035 | 0,043 | 0,050 | 0,062 | 0,072 | 15° | 0,5xD | | |
| 90 - 135 | 0,040 | 0,051 | 0,062 | 0,072 | 0,090 | 0,105 | 30° | 0,5xD | | |
| 60 - 65 | 0,024 | 0,031 | 0,037 | 0,044 | 0,054 | 0,063 | 15° | 0,5xD | | |
| 55 - 60 | 0,020 | 0,026 | 0,031 | 0,036 | 0,045 | 0,052 | 15° | 0,5xD | | |
| 240 | 0,068 | 0,088 | 0,107 | 0,124 | 0,156 | 0,180 | 45° | 0,75xD | 0,80 | |
| 100 - 220 | 0,058 | 0,075 | 0,091 | 0,106 | 0,132 | 0,153 | 45° | 0,75xD | 0,80 | |
| 150 - 160 | 0,048 | 0,062 | 0,075 | 0,087 | 0,109 | 0,126 | 45° | 0,75xD | 0,80 | |

**Schruppen
Roughing**



**Schlichten
Finishing**



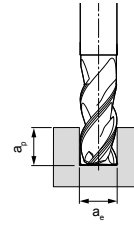
| v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | | | | | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | | | |
|------------------|---|---|-------|-------|-------|-------|-------|-------|-------|-----------|------------------|---|-------|-------|-------|-------|-------|-------|-------|----|
| | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | | | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | |
| | 2 | 4 | 6 | 8 | 10 | 12 | 16 | 20 | 25 | | | 2 | 4 | 6 | 8 | 10 | 12 | 16 | 20 | 25 |
| 330 - 405 | - | - | 0,056 | 0,072 | 0,087 | 0,101 | 0,127 | 0,147 | 0,163 | 485 - 595 | - | - | 0,088 | 0,113 | 0,137 | 0,160 | 0,200 | 0,232 | 0,257 | |
| 260 - 370 | - | - | 0,056 | 0,072 | 0,087 | 0,101 | 0,127 | 0,147 | 0,163 | 380 - 540 | - | - | 0,088 | 0,113 | 0,137 | 0,160 | 0,200 | 0,232 | 0,257 | |
| 200 - 240 | - | - | 0,053 | 0,068 | 0,083 | 0,096 | 0,120 | 0,140 | 0,155 | 295 - 350 | - | - | 0,084 | 0,108 | 0,131 | 0,152 | 0,190 | 0,221 | 0,244 | |
| 165 | - | - | 0,037 | 0,048 | 0,058 | 0,068 | 0,085 | 0,098 | 0,108 | 245 | - | - | 0,059 | 0,076 | 0,092 | 0,107 | 0,134 | 0,155 | 0,172 | |
| 165 - 245 | - | - | 0,054 | 0,069 | 0,084 | 0,098 | 0,123 | 0,142 | 0,157 | 245 - 360 | - | - | 0,085 | 0,110 | 0,133 | 0,155 | 0,194 | 0,225 | 0,249 | |
| 110 - 120 | - | - | 0,033 | 0,042 | 0,051 | 0,059 | 0,074 | 0,086 | 0,095 | 160 - 180 | - | - | 0,051 | 0,066 | 0,080 | 0,093 | 0,117 | 0,135 | 0,150 | |
| 105 - 110 | - | - | 0,027 | 0,035 | 0,042 | 0,049 | 0,061 | 0,071 | 0,079 | 150 - 160 | - | - | 0,043 | 0,055 | 0,066 | 0,077 | 0,097 | 0,112 | 0,124 | |
| 440 | - | - | 0,093 | 0,119 | 0,145 | 0,169 | 0,211 | 0,245 | 0,271 | 650 | - | - | 0,147 | 0,189 | 0,229 | 0,267 | 0,334 | 0,387 | 0,429 | |
| 185 - 405 | - | - | 0,079 | 0,102 | 0,123 | 0,144 | 0,180 | 0,208 | 0,231 | 270 - 595 | - | - | 0,125 | 0,161 | 0,195 | 0,227 | 0,284 | 0,329 | 0,365 | |
| 275 - 295 | - | - | 0,065 | 0,084 | 0,101 | 0,118 | 0,148 | 0,171 | 0,190 | 405 - 430 | - | - | 0,103 | 0,132 | 0,160 | 0,187 | 0,234 | 0,271 | 0,300 | |

* Angegebene Schnittdaten sind als Richtwert zu sehen, welche durch Versuche für jeden Anwendungsfall separat optimiert werden.
 * Recommended cutting data has to be seen as a reference which can be optimised for each application through trials separately

Schnittwertempfehlung für Eckfräser, Vorschub und Schnittgeschwindigkeit
Recommended cutting values for corner milling cutters, feed and cutting speed

UNItec N long Z2

Nutfräsen
 Groove milling

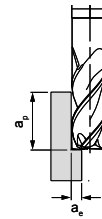


$$a_p = 1 \times D$$

$$a_e = 1 \times D$$

| BZG | | Kühlung Cooling | | | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | | |
|-----|---|---------------------|----------------|-------------|------------------|---|-------|-------|-------|-------|-------|-------|----|
| | | MMS/Luft MMS/Air | Trocken Dry | Nass Wet | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | |
| | | | | | | 2 | 4 | 6 | 8 | 10 | 12 | 16 | 20 |
| N1 | ● | ● | ● | 600 | 0,017 | 0,031 | 0,044 | 0,056 | 0,068 | 0,080 | 0,100 | 0,115 | |
| N2 | ● | ● | ● | 230 - 400 | 0,018 | 0,032 | 0,046 | 0,059 | 0,072 | 0,084 | 0,105 | 0,121 | |
| N3 | ● | ● | ● | 175 - 290 | 0,014 | 0,025 | 0,035 | 0,045 | 0,055 | 0,064 | 0,080 | 0,092 | |

Teilschnitt
 Partial cut



$$a_p = 1,5xD$$

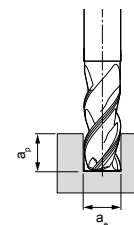
$$a_e = 0,25xD$$

MULTItec N long neck Z3

| BZG | | Kühlung Cooling | | | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | |
|-----|---|---------------------|----------------|-------------|------------------|---|-------|-------|-------|-------|----|
| | | MMS/Luft MMS/Air | Trocken Dry | Nass Wet | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | |
| | | | | | | 5 | 8 | 10 | 12 | 16 | 20 |
| N1 | ● | ● | ● | 945 | 0,080 | 0,120 | 0,145 | 0,169 | 0,210 | 0,243 | |
| N2 | ● | ● | ● | 360 - 625 | 0,084 | 0,126 | 0,152 | 0,177 | 0,221 | 0,256 | |
| N3 | ● | ● | ● | 270 - 450 | 0,064 | 0,096 | 0,116 | 0,135 | 0,168 | 0,195 | |

| Werkzeuglänge/ Korrekturfaktor: Tool length/Correction factor: | |
|---|---------------|
| Länge Length | f_z & v_c |
| kurz short | 1 |
| lang long | 0,9 |
| überlang extra long | 0,8 |
| extra lang ultra long | 0,6 |

Nutfräsen
 Groove milling



$$a_p = 1 \times D$$

$$a_e = 1 \times D$$

UNItec Pro N long neck Z3

| BZG | | Kühlung Cooling | | | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | | |
|-----|---|---------------------|----------------|-------------|------------------|---|-------|-------|-------|-------|-------|-------|----|
| | | MMS/Luft MMS/Air | Trocken Dry | Nass Wet | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | |
| | | | | | | 2 | 4 | 6 | 8 | 10 | 12 | 16 | 20 |
| N1 | ● | ● | ● | 755 | 0,022 | 0,038 | 0,055 | 0,070 | 0,085 | 0,100 | 0,125 | 0,144 | |
| N2 | ● | ● | ● | 290 - 500 | 0,023 | 0,040 | 0,057 | 0,074 | 0,090 | 0,105 | 0,131 | 0,152 | |
| N3 | ● | ● | ● | 215 - 360 | 0,017 | 0,031 | 0,044 | 0,056 | 0,068 | 0,080 | 0,100 | 0,115 | |

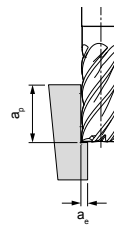
Schruppen
Roughing



$$a_p = 1,5 \times D$$

$$a_e = 0,25 \times D$$

Schlichten
Finishing

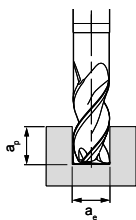


$$a_p = 1,5 \times D$$

$$a_e = 0,1 \times D$$

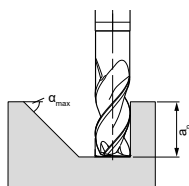
| v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | | | | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | | | |
|------------------|---|-------|-------|-------|-------|-------|-------|-------|------------|------------------|---|-------|-------|-------|-------|-------|-------|--|--|
| | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | |
| | 2 | 4 | 6 | 8 | 10 | 12 | 16 | 20 | 2 | | 4 | 6 | 8 | 10 | 12 | 16 | 20 | | |
| 1230 | 0,030 | 0,052 | 0,074 | 0,096 | 0,116 | 0,135 | 0,169 | 0,196 | 1805 | 0,047 | 0,083 | 0,117 | 0,151 | 0,183 | 0,214 | 0,267 | 0,310 | | |
| 470 - 820 | 0,031 | 0,055 | 0,078 | 0,100 | 0,122 | 0,142 | 0,177 | 0,206 | 690 - 1200 | 0,049 | 0,087 | 0,123 | 0,159 | 0,192 | 0,224 | 0,281 | 0,325 | | |
| 355 - 590 | 0,024 | 0,042 | 0,059 | 0,076 | 0,093 | 0,108 | 0,135 | 0,157 | 520 - 865 | 0,037 | 0,066 | 0,094 | 0,121 | 0,147 | 0,171 | 0,214 | 0,248 | | |

Vollschnitt
Full cut



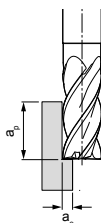
$$a_p = 1 \times D$$

$$a_e = 1 \times D$$



| v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | | Rampen Ramping | Helikales Eintauchen helikal ramping in | Bohren Drilling |
|------------------|---|-------|-------|-------|-------|-------|-----|--------------------|--|--------------------|
| | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | α_{max} [°] | $a_{p,max} \text{ helix}$ [mm] | f_z Faktor |
| | 5 | 8 | 10 | 12 | 16 | 20 | | | | |
| 610 | 0,047 | 0,071 | 0,086 | 0,099 | 0,124 | 0,144 | 45° | 0,75xD | 0,8 | |
| 235 - 405 | 0,049 | 0,074 | 0,090 | 0,104 | 0,130 | 0,151 | 45° | 0,75xD | 0,8 | |
| 175 - 295 | 0,038 | 0,057 | 0,068 | 0,080 | 0,099 | 0,115 | 45° | 0,75xD | 0,8 | |

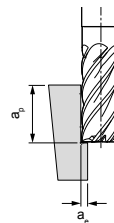
Schruppen
Roughing



$$a_p = 1,5 \times D$$

$$a_e = 0,25 \times D$$

Schlichten
Finishing



$$a_p = 1,5 \times D$$

$$a_e = 0,1 \times D$$

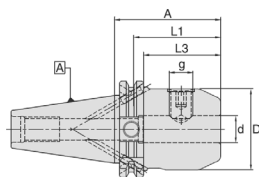
| v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | | | | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | | | |
|------------------|---|-------|-------|-------|-------|-------|-------|-------|------|------------------|---|-------|-------|-------|-------|-------|-------|--|--|
| | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | |
| | 2 | 4 | 6 | 8 | 10 | 12 | 16 | 20 | 2 | | 4 | 6 | 8 | 10 | 12 | 16 | 20 | | |
| 1540 | 0,037 | 0,065 | 0,093 | 0,119 | 0,145 | 0,169 | 0,211 | 0,245 | 2255 | 0,058 | 0,103 | 0,147 | 0,189 | 0,229 | 0,267 | 0,334 | 0,387 | | |
| 1025 | 0,039 | 0,069 | 0,098 | 0,125 | 0,152 | 0,177 | 0,222 | 0,257 | 1500 | 0,061 | 0,108 | 0,154 | 0,198 | 0,241 | 0,280 | 0,351 | 0,406 | | |
| 590 | 0,030 | 0,052 | 0,074 | 0,096 | 0,116 | 0,135 | 0,169 | 0,196 | 865 | 0,047 | 0,083 | 0,117 | 0,151 | 0,183 | 0,214 | 0,267 | 0,310 | | |

* Angegebene Schnittdaten sind als Richtwert zu sehen, welche durch Versuche für jeden Anwendungsfall separat optimiert werden.
 * Recommended cutting data has to be seen as a reference which can be optimised for each application through trials separately

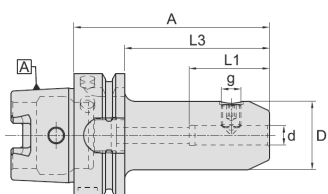
SK- und HSK- Werkzeugaufnahmen für Allgemeine Anwendungen und Nutfräsen

SK- und HSK- Tool holders for General machining and slot milling

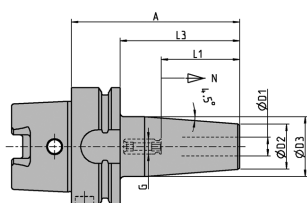
www.boehlerit.com



| Aufnahme SK40 für Schaftfräser Chuck SK40 for end milling cutter | | | | | | | |
|---|---------------------------------|-----------------------------|-------------------------------|------|---------------------------------|-----------------------------|-------------------------------|
| Ø Dc | SK-40-Bezeichnung SK-40-Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Ø Dc | SK-40-Bezeichnung SK-40-Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability |
| Ø6 | WSLH/06-50/SK-40 | 4600745 | ○ | Ø16 | WSLH/16-35/SK-40 | 4600771 | ● |
| Ø8 | WSLH/08-50/SK-40 | 4600750 | ○ | Ø18 | WSLH/18-63/SK-40 | 4600776 | ○ |
| Ø10 | WSLH/10-50/SK-40 | 4600755 | ○ | Ø20 | WSLH/20-35/SK-40 | 4600782 | ● |
| Ø12 | WSLH/12-50/SK-40 | 4600760 | ○ | Ø25 | WSLH/25-35/SK-40 | 4600788 | ● |
| Ø14 | WSLH/14-50/SK-40 | 4600770 | ○ | | | | |



| Aufnahme HSK-A63 für Schaftfräser Chuck HSK-A63 for end milling cutter | | | | Aufnahme HSK-A100 für Schaftfräser Chuck HSK-A100 for end milling cutter | | | |
|---|-------------------------------------|-----------------------------|-------------------------------|---|---------------------------------------|-----------------------------|-------------------------------|
| Ø Dc | HSK-A63-Bezeichnung HSK-A63-Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Ø Dc | HSK-A100-Bezeichnung HSK-A100-Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability |
| Ø6 | WSLH/06-65/HSK-A63 | 4601702 | ○ | Ø6 | WSLH/06-80/HSK-A100 | 4601614 | ○ |
| Ø8 | WSLH/08-65/HSK-A63 | 4601705 | ○ | Ø8 | WSLH/08-80/HSK-A100 | 4601616 | ○ |
| Ø10 | WSLH/10-65/HSK-A63 | 4601708 | ○ | Ø10 | WSLH/10-80/HSK-A100 | 4601618 | ○ |
| Ø12 | WSLH/12-80/HSK-A63 | 4601711 | ○ | Ø12 | WSLH/12-80/HSK-A100 | 4601620 | ○ |
| Ø14 | WSLH/14-80/HSK-A63 | 4601715 | ○ | Ø14 | WSLH/14-80/HSK-A100 | 4601622 | ○ |
| Ø16 | WSLH/16-80/HSK-A63 | 4601719 | ○ | Ø16 | WSLH/16-100/HSK-A100 | 4601624 | ● |
| Ø18 | WSLH/18-80/HSK-A63 | 4601723 | ○ | Ø18 | WSLH/18-100/HSK-A100 | 4601626 | ○ |
| Ø20 | WSLH/20-80/HSK-A63 | 4601727 | ● | Ø20 | WSLH/20-100/HSK-A100 | 4601628 | ● |
| Ø20 | WSLH/20-100/HSK-A63 | 5065495 | ○ | Ø25 | WSLH/25-100/HSK-A100 | 4601630 | ● |
| Ø25 | WSLH/25-110/HSK-A63 | 4601730 | ● | | | | |



| Aufnahme HSK-A63 für Schaftfräser Chuck HSK-A63 for end milling cutter | | | | Aufnahme HSK-A100 für Schaftfräser Chuck HSK-A100 for end milling cutter | | | |
|---|-------------------------------------|-----------------------------|-------------------------------|---|---------------------------------------|-----------------------------|-------------------------------|
| Ø Dc | HSK-A63-Bezeichnung HSK-A63-Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Ø Dc | HSK-A100-Bezeichnung HSK-A100-Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability |
| Ø3 | T0300/HSK-A63 | 6726618 | ○ | Ø6 | T0600/HSK-A100 | 6726342 | ○ |
| Ø6 | T0600/HSK-A63 | 6726201 | ○ | Ø8 | T0800/HSK-A100 | 6726343 | ○ |
| Ø8 | T0800/HSK-A63 | 6726202 | ○ | Ø10 | T1000/HSK-A100 | 6726344 | ● |
| Ø10 | T1000/HSK-A63 | 6726203 | ● | Ø12 | T1200/HSK-A100 | 6726345 | ● |
| Ø12 | T1200/HSK-A63 | 6726204 | ● | Ø14 | T1400/HSK-A100 | 6726346 | ○ |
| Ø14 | T1400/HSK-A63 | 6726205 | ○ | Ø16 | T1600/HSK-A100 | 6726347 | ● |
| Ø16 | T1600/HSK-A63 | 6726206 | ● | Ø20 | T2000/HSK-A100 | 6726349 | ● |
| Ø20 | T2000/HSK-A63 | 6726207 | ● | | | | |

Detaillierte Unterlagen und Abmessungen finden Sie ab Seite 316
Detailed documents and dimensions can be found from page 316

● Verfügbar ab Lager Available from stock
○ Lieferzeit auf Anfrage Delivery time on request

Eckfräsen - Schruppen
Edge milling roughing

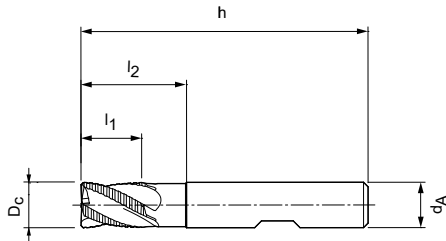


| Eckfräsen - Schruppen Edge milling roughing | |
|---|--------|
| UNItec Pro | |
|  | |
| Zähnezahl Amount teeth | Z3, Z4 |
| P.1 | ■ |
| P.2 | ■ |
| P.3 | ■ |
| P.4 | ■ |
| P.5 | ■ |
| M.1 | ■ |
| M.2 | ■ |
| K.1 | ■ |
| K.2 | ■ |
| K.3 | ■ |

UNItec Pro rough short neck

Kurze Ausführung mit Hals Z3/4

Execution short neck Z3/4



| Hard Facts | |
|--------------------|---|
| Fräserdurchmesser: | 5,00 - 20,00 mm |
| Beschichtung: | AlCrN PVD |
| Schneidenzahl: | Z = 3 ≤ ø 8 mm Z = 4 ≥ ø 9 mm |
| Drallwinkel: | 30° |
| Besonderheiten: | Ungleichteilung, Profilhinterschliffene HPC-Schruppverzahnung |
| Diameter: | 5.00 - 20.00 mm |
| Coating: | AlCrN PVD |
| Amount/Teeth: | Z = 3 ≤ ø 8 mm Z = 4 ≥ ø 9 mm |
| Helix angle: | 30° |
| Special feature: | Unequal division, special HPC roughing geometry |

| UNItec Pro rough short neck | | |
|-----------------------------|-----|---|
| ISO | | |
| P | P.1 | ■ |
| | P.2 | ■ |
| | P.3 | ■ |
| | P.4 | ■ |
| | P.5 | ■ |
| M | M.1 | ■ |
| | M.2 | ■ |
| K | K.1 | ■ |
| | K.2 | ■ |
| | K.3 | ■ |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|-------|----------------|----------------|--------|---|-----------------|
| | | | D _c | d _A | h | l ₁ | l ₂ | Cx 45° | | |
| UP05.008.054 Cx Z3 HB | 5163341 | ● | *5,00 | 6,00 | 54,00 | 8,00 | – | 0,30 | 3 | HB |
| UP06.008.054 Cx Z3 HB | 5163342 | ● | 6,00 | 6,00 | 54,00 | 8,00 | 18,00 | 0,30 | 3 | HB |
| UP07.011.058 Cx Z3 HB | 5163343 | ● | *7,00 | 8,00 | 58,00 | 11,00 | – | 0,30 | 3 | HB |
| UP08.011.058 Cx Z3 HB | 5163344 | ● | 8,00 | 8,00 | 58,00 | 11,00 | 22,00 | 0,30 | 3 | HB |
| UP09.013.066 Cx Z4 HB | 5163345 | ● | *9,00 | 10,00 | 66,00 | 13,00 | – | 0,50 | 4 | HB |
| UP10.013.066 Cx Z4 HB | 5163346 | ● | 10,00 | 10,00 | 66,00 | 13,00 | 26,00 | 0,50 | 4 | HB |
| UP12.016.073 Cx Z4 HB | 5163347 | ● | 12,00 | 12,00 | 73,00 | 16,00 | 28,00 | 0,50 | 4 | HB |
| UP14.016.076 Cx Z4 HB | 5163348 | ● | 14,00 | 14,00 | 76,00 | 16,00 | 31,00 | 0,50 | 4 | HB |
| UP16.019.082 Cx Z4 HB | 5163349 | ● | 16,00 | 16,00 | 82,00 | 19,00 | 34,00 | 0,50 | 4 | HB |
| UP18.019.084 Cx Z4 HB | 5163350 | ● | 18,00 | 18,00 | 84,00 | 19,00 | 36,00 | 0,50 | 4 | HB |
| UP20.020.092 Cx Z4 HB | 5163351 | ● | 20,00 | 20,00 | 92,00 | 20,00 | 42,00 | 0,50 | 4 | HB |

Bestellbeispiel Order example: 1 Stück piece 5163341 oder or UP05.008.054 Cx Z3 HB

Genauere Schnittwertempfehlung siehe Seite 244

Detailed cutting recommendations, see page 244

* Ausführung ohne Hals

* Version without neck

● Verfügbar ab Lager Available from stock

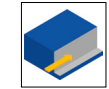
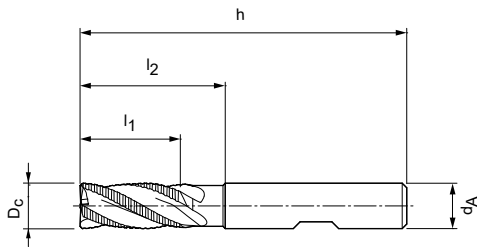
● Kurzfristig lieferbar Shortly available

○ Lieferzeit auf Anfrage Delivery time on request

UNitec Pro rough long neck

Lange Ausführung mit Hals Z3/4/5

Execution long neck Z3/4/5



| Hard Facts | |
|--------------------|---|
| Fräserdurchmesser: | 4,00 - 25,00 mm |
| Beschichtung: | AlCrN PVD |
| Schneidenzahl: | Z = 3 ≤ ø 8 mm Z = 4 ø 9 - 24,9 mm Z = 5 ≥ ø 25 mm |
| Drallwinkel: | 30° |
| Besonderheiten: | Ungleichteilung, Profilhinterschliffene HPC-Schruppverzahnung |
| Diameter: | 4.00 - 25.00 mm |
| Coating: | AlCrN PVD |
| Amount/Teeth: | Z = 3 ≤ ø 8 mm Z = 4 ø 9 - 24,9 mm Z = 5 ≥ ø 25 mm |
| Helix angle: | 30° |
| Special feature: | Unequal division, special HPC roughing geometry |

| UNitec Pro rough long neck | | |
|----------------------------|-----|---|
| ISO | | |
| P | P.1 | ■ |
| | P.2 | ■ |
| | P.3 | ■ |
| | P.4 | ■ |
| | P.5 | ■ |
| M | M.1 | ■ |
| | M.2 | ■ |
| K | K.1 | ■ |
| | K.2 | ■ |
| | K.3 | ■ |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|--------|----------------|----------------|--------|---|-----------------|
| | | | D _c | d _A | h | l ₁ | l ₂ | Cx 45° | | |
| UP04.008.057 Cx Z3 HB | 5162990 | ● | *4,00 | 6,00 | 57,00 | 8,00 | - | 0,30 | 3 | HB |
| UP05.013.057 Cx Z3 HB | 5162992 | ● | *5,00 | 6,00 | 57,00 | 13,00 | - | 0,30 | 3 | HB |
| UP06.013.057 Cx Z3 HB | 5162993 | ● | 6,00 | 6,00 | 57,00 | 13,00 | 21,00 | 0,30 | 3 | HB |
| UP07.016.063 Cx Z3 HB | 5162994 | ● | *7,00 | 8,00 | 63,00 | 16,00 | - | 0,30 | 3 | HB |
| UP08.016.063 Cx Z3 HB | 5162995 | ● | 8,00 | 8,00 | 63,00 | 16,00 | 26,00 | 0,30 | 3 | HB |
| UP09.019.072 Cx Z4 HB | 5163000 | ● | *9,00 | 10,00 | 72,00 | 19,00 | - | 0,50 | 4 | HB |
| UP10.022.072 Cx Z4 HB | 5163001 | ● | 10,00 | 10,00 | 72,00 | 22,00 | 32,00 | 0,50 | 4 | HB |
| UP11.026.083 Cx Z4 HB | 5163216 | ○ | *11,00 | 12,00 | 83,00 | 26,00 | - | 0,50 | 4 | HB |
| UP12.026.083 Cx Z4 HB | 5162979 | ● | 12,00 | 12,00 | 83,00 | 26,00 | 38,00 | 0,50 | 4 | HB |
| UP13.026.083 Cx Z4 HB | 5163217 | ○ | *13,00 | 14,00 | 83,00 | 26,00 | - | 0,50 | 4 | HB |
| UP14.026.083 Cx Z4 HB | 5163219 | ○ | 14,00 | 14,00 | 83,00 | 26,00 | 42,00 | 0,50 | 4 | HB |
| UP16.032.092 Cx Z4 HB | 5162986 | ● | 16,00 | 16,00 | 92,00 | 32,00 | 44,00 | 0,50 | 4 | HB |
| UP18.032.092 Cx Z4 HB | 5163220 | ○ | 18,00 | 18,00 | 92,00 | 32,00 | 48,00 | 0,50 | 4 | HB |
| UP20.038.104 Cx Z4 HB | 5162987 | ● | 20,00 | 20,00 | 104,00 | 38,00 | 54,00 | 0,50 | 4 | HB |
| UP25.045.121 Cx Z5 HB | 5163221 | ○ | 25,00 | 25,00 | 121,00 | 45,00 | 65,00 | 0,50 | 5 | HB |

Bestellbeispiel Order example: 1 Stück piece 5162990 oder or UP04.008.057 Cx Z3 HB
 Genaue Schnittwertempfehlung siehe Seite 244 * Ausführung ohne Hals
 Detailed cutting recommendations, see page 244 * Version without neck

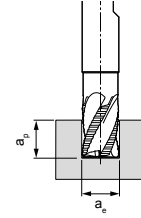
● Verfügbar ab Lager Available from stock
 ○ Kurzfristig lieferbar Shortly available
 ○ Lieferzeit auf Anfrage Delivery time on request

Schnittwertempfehlung für Eckfräser, Vorschub und Schnittgeschwindigkeit
Recommended cutting values for corner milling cutters, feed and cutting speed

UNiTec Pro rough
 short neck, long neck

| Werkzeuflänge/ Korrekturfaktor: Tool length/Correction factor: | |
|---|---------------|
| Länge Length | f_z & v_c |
| kurz short | 1 |
| lang long | 0,9 |
| überlang extra long | 0,8 |
| extra lang ultra long | 0,6 |

Nutfräsen
 Groove milling

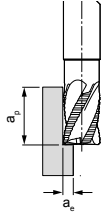


$$a_p = 1 \times D$$

$$a_e = 1 \times D$$

| BZG | | Kühlung Cooling | | | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | |
|-----|----|---------------------|----------------|-------------|------------------|---|-------|-------|-------|-------|-------|-------|
| | | MMS/Luft MMS/Air | Trocken Dry | Nass Wet | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | |
| | | | | | | 6 | 8 | 10 | 12 | 16 | 20 | 25 |
| P | P1 | ● | ● | ● | 160 - 200 | 0,033 | 0,042 | 0,051 | 0,060 | 0,075 | 0,087 | 0,096 |
| | P2 | ● | ● | ● | 125 - 180 | 0,033 | 0,042 | 0,051 | 0,060 | 0,075 | 0,087 | 0,096 |
| | P3 | ● | ● | ● | 100 - 115 | 0,031 | 0,040 | 0,049 | 0,057 | 0,071 | 0,082 | 0,091 |
| | P4 | ● | | ● | 80 | 0,022 | 0,028 | 0,034 | 0,040 | 0,050 | 0,058 | 0,064 |
| | P5 | | | ● | 80 - 120 | 0,032 | 0,041 | 0,050 | 0,058 | 0,072 | 0,084 | 0,093 |
| M | M1 | ● | | ● | 55 - 60 | 0,019 | 0,025 | 0,030 | 0,035 | 0,044 | 0,051 | 0,056 |
| | M2 | | | ● | 50 - 55 | 0,016 | 0,020 | 0,025 | 0,029 | 0,036 | 0,042 | 0,046 |
| K | K1 | ● | ● | ● | 215 | 0,055 | 0,070 | 0,085 | 0,100 | 0,125 | 0,144 | 0,160 |
| | K2 | ● | ● | ● | 90 - 200 | 0,047 | 0,060 | 0,073 | 0,085 | 0,106 | 0,123 | 0,136 |
| | K3 | ● | ● | ● | 135 - 145 | 0,038 | 0,049 | 0,060 | 0,070 | 0,087 | 0,101 | 0,112 |

Schruppen
Roughing



$$a_p = 1,5 \times D$$

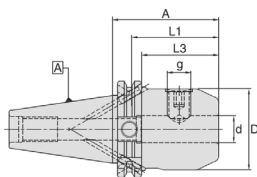
$$a_e = 0,25 \times D$$

| | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | |
|--|------------------|---|-------|-------|-------|-------|-------|-------|
| | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | |
| | | 6 | 8 | 10 | 12 | 16 | 20 | 25 |
| | 330 - 405 | 0,056 | 0,072 | 0,087 | 0,101 | 0,127 | 0,147 | 0,163 |
| | 260 - 370 | 0,056 | 0,072 | 0,087 | 0,101 | 0,127 | 0,147 | 0,163 |
| | 200 - 240 | 0,053 | 0,068 | 0,083 | 0,096 | 0,120 | 0,140 | 0,155 |
| | 165 | 0,037 | 0,048 | 0,058 | 0,068 | 0,085 | 0,098 | 0,108 |
| | 165 - 245 | 0,054 | 0,069 | 0,084 | 0,098 | 0,123 | 0,142 | 0,157 |
| | 110 - 120 | 0,033 | 0,042 | 0,051 | 0,059 | 0,074 | 0,086 | 0,095 |
| | 105 - 110 | 0,027 | 0,035 | 0,042 | 0,049 | 0,061 | 0,071 | 0,079 |
| | 440 | 0,093 | 0,119 | 0,145 | 0,169 | 0,211 | 0,245 | 0,271 |
| | 185 - 405 | 0,079 | 0,102 | 0,123 | 0,144 | 0,180 | 0,208 | 0,231 |
| | 275 - 295 | 0,065 | 0,084 | 0,101 | 0,118 | 0,148 | 0,171 | 0,190 |

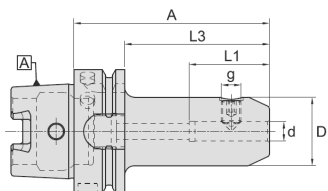
* Angegebene Schnittdaten sind als Richtwert zu sehen, welche durch Versuche für jeden Anwendungsfall separat optimiert werden.
 * Recommended cutting data has to be seen as a reference which can be optimised for each application through trials separately

SK- und HSK- Werkzeugaufnahmen für Eckfräsen - Schruppen SK- and HSK- Tool holders for Edge milling roughing

www.boehlerit.com

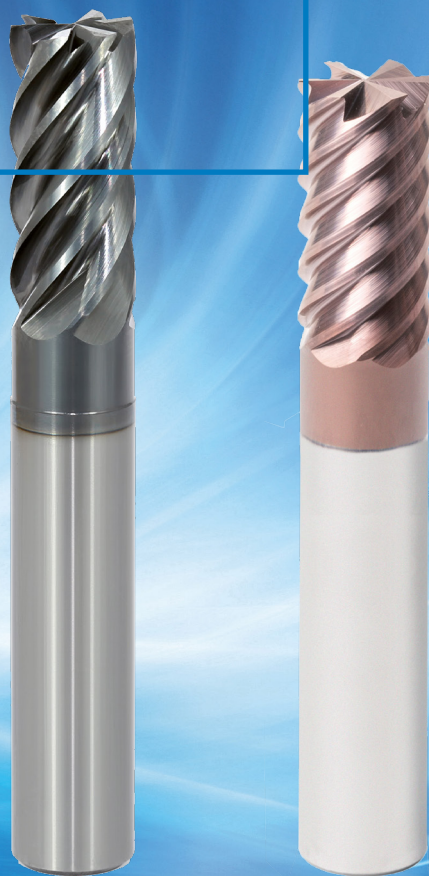




| Aufnahme SK40 für Schaftfräser Chuck SK40 for end milling cutter | | | | | | | |
|---|---------------------------------|-----------------------------|-------------------------------|------|---------------------------------|-----------------------------|-------------------------------|
| Ø Dc | SK-40-Bezeichnung SK-40-Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Ø Dc | SK-40-Bezeichnung SK-40-Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability |
| Ø6 | WSLH/06-50/SK-40 | 4600745 | ○ | Ø16 | WSLH/16-35/SK-40 | 4600771 | ● |
| Ø8 | WSLH/08-50/SK-40 | 4600750 | ○ | Ø18 | WSLH/18-63/SK-40 | 4600776 | ○ |
| Ø10 | WSLH/10-50/SK-40 | 4600755 | ○ | Ø20 | WSLH/20-35/SK-40 | 4600782 | ● |
| Ø12 | WSLH/12-50/SK-40 | 4600760 | ○ | Ø25 | WSLH/25-35/SK-40 | 4600788 | ● |
| Ø14 | WSLH/14-50/SK-40 | 4600770 | ○ | | | | |



| Aufnahme HSK-A63 für Schaftfräser Chuck HSK-A63 for end milling cutter | | | | Aufnahme HSK-A100 für Schaftfräser Chuck HSK-A100 for end milling cutter | | | |
|---|-------------------------------------|-----------------------------|-------------------------------|---|---------------------------------------|-----------------------------|-------------------------------|
| Ø Dc | HSK-A63-Bezeichnung HSK-A63-Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Ø Dc | HSK-A100-Bezeichnung HSK-A100-Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability |
| Ø6 | WSLH/06-65/HSK-A63 | 4601702 | ○ | Ø6 | WSLH/06-80/HSK-A100 | 4601614 | ○ |
| Ø8 | WSLH/08-65/HSK-A63 | 4601705 | ○ | Ø8 | WSLH/08-80/HSK-A100 | 4601616 | ○ |
| Ø10 | WSLH/10-65/HSK-A63 | 4601708 | ○ | Ø10 | WSLH/10-80/HSK-A100 | 4601618 | ○ |
| Ø12 | WSLH/12-80/HSK-A63 | 4601711 | ○ | Ø12 | WSLH/12-80/HSK-A100 | 4601620 | ○ |
| Ø14 | WSLH/14-80/HSK-A63 | 4601715 | ○ | Ø14 | WSLH/14-80/HSK-A100 | 4601622 | ○ |
| Ø16 | WSLH/16-80/HSK-A63 | 4601719 | ○ | Ø16 | WSLH/16-100/HSK-A100 | 4601624 | ● |
| Ø18 | WSLH/18-80/HSK-A63 | 4601723 | ○ | Ø18 | WSLH/18-100/HSK-A100 | 4601626 | ○ |
| Ø20 | WSLH/20-80/HSK-A63 | 4601727 | ● | Ø20 | WSLH/20-100/HSK-A100 | 4601628 | ● |
| Ø20 | WSLH/20-100/HSK-A63 | 5065495 | ○ | Ø25 | WSLH/25-100/HSK-A100 | 4601630 | ● |
| Ø25 | WSLH/25-110/HSK-A63 | 4601730 | ● | | | | |

Eckfräsen - Schlichten
Edge milling finishing

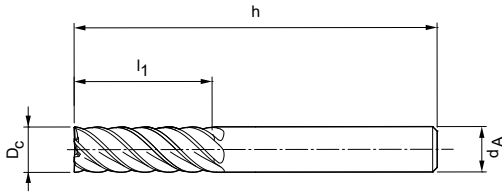


| Eckfräsen - Schlichten Edge milling finishing | | |
|--|---|---|
| | UNIttec | UNIttec Pro |
| |  |  |
| Zähnezahl Amount teeth | Z6, Z8 | Z6 |
| P.1 | ■ | ■ |
| P.2 | ■ | ■ |
| P.3 | ■ | ■ |
| P.4 | ■ | ■ |
| P.5 | ■ | ■ |
| M.1 | □ | ■ |
| M.2 | □ | ■ |
| K.1 | ■ | ■ |
| K.2 | ■ | ■ |
| K.3 | □ | ■ |
| N.1 | □ | |
| N.2 | □ | |
| N.3 | □ | |
| H.1 | | ■ |
| H.2 | | ■ |
| H.3 | | ■ |
| H.4 | | ■ |

UNIttec Finish extra long

Extra lange Ausführung Z6/8

Execution extra long Z6/8



| Hard Facts | |
|--------------------|------------------------------------|
| Fräserdurchmesser: | 4,00 - 25,00 mm |
| Beschichtung: | TiAIN PVD |
| Schneidenzahl: | Z = 6 ≤ ø 16 mm Z = 8 ≥ ø 20 mm |
| Drallwinkel: | 45° |
| Diameter: | 4.00 - 25.00 mm |
| Coating: | TiAIN PVD |
| Amount/Teeth: | Z = 6 ≤ ø 16 mm Z = 8 ≥ ø 20 mm |
| Helix angle: | 45° |

| UNIttec Finish extra long | | |
|---------------------------|-----|---|
| ISO | | |
| P | P.1 | ■ |
| | P.2 | ■ |
| | P.3 | ■ |
| | P.4 | ■ |
| | P.5 | ■ |
| M | M.1 | □ |
| | M.2 | □ |
| K | K.1 | ■ |
| | K.2 | ■ |
| | K.3 | □ |
| N | N.1 | □ |
| | N.2 | □ |
| | N.3 | □ |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|--------|----------------|--------|---|-----------------|
| | | | D _C | d _A | h | l ₁ | Cx 45° | | |
| U04.016.062 Cx Z6 HA | 5162895 | ○ | 4,00 | 6,00 | 62,00 | 16,00 | 0,04 | 6 | HA |
| U05.018.062 Cx Z6 HA | 5162896 | ● | 5,00 | 6,00 | 62,00 | 18,00 | 0,05 | 6 | HA |
| U06.018.062 Cx Z6 HA | 5162897 | ● | 6,00 | 6,00 | 62,00 | 18,00 | 0,06 | 6 | HA |
| U08.024.068 Cx Z6 HA | 5162898 | ● | 8,00 | 8,00 | 68,00 | 24,00 | 0,08 | 6 | HA |
| U10.030.080 Cx Z6 HA | 5162899 | ● | 10,00 | 10,00 | 80,00 | 30,00 | 0,10 | 6 | HA |
| U12.036.093 Cx Z6 HA | 5162900 | ○ | 12,00 | 12,00 | 93,00 | 36,00 | 0,12 | 6 | HA |
| U16.048.108 Cx Z6 HA | 5162906 | ● | 16,00 | 16,00 | 108,00 | 48,00 | 0,16 | 6 | HA |
| U20.060.126 Cx Z8 HA | 5162907 | ● | 20,00 | 20,00 | 126,00 | 60,00 | 0,20 | 8 | HA |
| U25.095.160 Cx Z8 HA | 5162908 | ● | 25,00 | 25,00 | 160,00 | 95,00 | 0,25 | 8 | HA |

Bestellbeispiel Order example: 1 Stück piece 5162895 oder or U04.016.062 Cx Z6 HA

Genauere Schnittwertempfehlung siehe Seite 254

Detailed cutting recommendations, see page 254

● Verfügbar ab Lager Available from stock

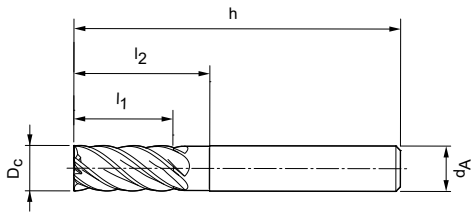
● Kurzfristig lieferbar Shortly available

○ Lieferzeit auf Anfrage Delivery time on request

UNItec Pro Finish long neck

Lange Ausführung mit Hals Z6

Execution long neck Z6



| Hard Facts | |
|--------------------|------------------|
| Fräserdurchmesser: | 6,00 - 20,00 mm |
| Beschichtung: | AlCrN PVD |
| Schneidenzahl: | Z = 6 |
| Drallwinkel: | 39° - 41° |
| Besonderheiten: | Ungleichteilung |
| Diameter: | 6.00 - 20.00 mm |
| Coating: | AlCrN PVD |
| Amount/Teeth: | Z = 6 |
| Helix angle: | 39° - 41° |
| Special feature: | Unequal division |

| UNItec Pro Finish long neck | | |
|-----------------------------|-----|---|
| ISO | | |
| P | P.1 | ■ |
| | P.2 | ■ |
| | P.3 | ■ |
| | P.4 | ■ |
| | P.5 | ■ |
| M | M.1 | ■ |
| | M.2 | ■ |
| K | K.1 | ■ |
| | K.2 | ■ |
| | K.3 | ■ |

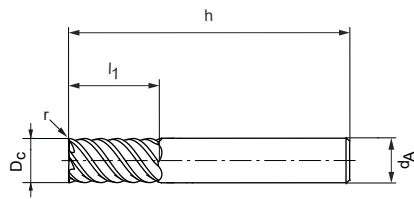
| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|--------|----------------|----------------|---|-----------------|
| | | | D _c | d _A | h | l ₁ | l ₂ | | |
| UP06.015.057 SH Z6 HA | 5163333 | ● | 6,00 | 6,00 | 57,00 | 15,00 | 20,00 | 6 | HA |
| UP08.021.063 SH Z6 HA | 5163335 | ● | 8,00 | 8,00 | 63,00 | 21,00 | 25,00 | 6 | HA |
| UP10.022.072 SH Z6 HA | 5163337 | ● | 10,00 | 10,00 | 72,00 | 22,00 | 30,00 | 6 | HA |
| UP12.026.083 SH Z6 HA | 5163338 | ● | 12,00 | 12,00 | 83,00 | 26,00 | 36,00 | 6 | HA |
| UP16.036.092 SH Z6 HA | 5163339 | ● | 16,00 | 16,00 | 92,00 | 36,00 | 42,00 | 6 | HA |
| UP20.041.104 SH Z6 HA | 5163340 | ● | 20,00 | 20,00 | 104,00 | 41,00 | 55,00 | 6 | HA |

Bestellbeispiel Order example: 1 Stück piece 5163333 oder or UP06.015.057 SH Z6 HA
 Genaue Schnittwertempfehlung siehe Seite 255
 Detailed cutting recommendations, see page 255

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

UNItec Pro H Finish neck 2xD

Ausführung 2xD
Execution 2xD



| Hard Facts | |
|--------------------|------------------|
| Fräserdurchmesser: | 4,00 - 20,00 mm |
| Beschichtung: | AlTiSiN PVD |
| Schneidenzahl: | Z = 6 |
| Drallwinkel: | 55° |
| Besonderheiten: | Ungleichteilung |
| Diameter: | 4.00 - 20.00 mm |
| Coating: | AlTiSiN PVD |
| Amount/Teeth: | Z = 6 |
| Helix angle: | 55° |
| Special feature: | Unequal division |

| UNItec Pro H Finish neck 2xD | | |
|------------------------------|-----|-------------------------------------|
| ISO | | |
| P | P.1 | <input type="checkbox"/> |
| | P.2 | <input type="checkbox"/> |
| | P.3 | <input type="checkbox"/> |
| | P.4 | <input type="checkbox"/> |
| | P.5 | <input type="checkbox"/> |
| M | M.1 | <input type="checkbox"/> |
| | M.2 | <input type="checkbox"/> |
| K | K.1 | <input type="checkbox"/> |
| | K.2 | <input type="checkbox"/> |
| | K.3 | <input type="checkbox"/> |
| H | H.1 | <input checked="" type="checkbox"/> |
| | H.2 | <input checked="" type="checkbox"/> |
| | H.3 | <input checked="" type="checkbox"/> |
| | H.4 | <input checked="" type="checkbox"/> |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|--------|----------------|------|---|-----------------|
| | | | D _c | d _A | h | l ₁ | r | | |
| UPH04.011.057 SH Z6 HA 2D | 5163364 | ● | 4,00 | 6,00 | 57,00 | 11,00 | - | 6 | HA |
| UPH04.011.057 FR0.5 Z6 HA 2D | 5163365 | ● | 4,00 | 6,00 | 57,00 | 11,00 | 0,50 | 6 | HA |
| UPH05.013.057 SH Z6 HA 2D | 5163367 | ● | 5,00 | 6,00 | 57,00 | 13,00 | - | 6 | HA |
| UPH05.013.057 FR0.5 Z6 HA 2D | 5163368 | ● | 5,00 | 6,00 | 57,00 | 13,00 | 0,50 | 6 | HA |
| UPH05.013.057 FR1.0 Z6 HA 2D | 5163370 | ● | 5,00 | 6,00 | 57,00 | 13,00 | 1,00 | 6 | HA |
| UPH06.013.057 SH Z6 HA 2D | 5163371 | ● | 6,00 | 6,00 | 57,00 | 13,00 | - | 6 | HA |
| UPH06.013.057 FR0.5 Z6 HA 2D | 5163372 | ● | 6,00 | 6,00 | 57,00 | 13,00 | 0,50 | 6 | HA |
| UPH06.013.057 FR1.0 Z6 HA 2D | 5163373 | ● | 6,00 | 6,00 | 57,00 | 13,00 | 1,00 | 6 | HA |
| UPH08.019.063 SH Z6 HA 2D | 5163374 | ● | 8,00 | 8,00 | 63,00 | 19,00 | - | 6 | HA |
| UPH08.019.063 FR0.5 Z6 HA 2D | 5163375 | ● | 8,00 | 8,00 | 63,00 | 19,00 | 0,50 | 6 | HA |
| UPH08.019.063 FR1.0 Z6 HA 2D | 5163377 | ● | 8,00 | 8,00 | 63,00 | 19,00 | 1,00 | 6 | HA |
| UPH10.022.072 SH Z6 HA 2D | 5163379 | ● | 10,00 | 10,00 | 72,00 | 22,00 | - | 6 | HA |
| UPH10.022.072 FR0.5 Z6 HA 2D | 5163384 | ● | 10,00 | 10,00 | 72,00 | 22,00 | 0,50 | 6 | HA |
| UPH10.022.072 FR1.0 Z6 HA 2D | 5163385 | ● | 10,00 | 10,00 | 72,00 | 22,00 | 1,00 | 6 | HA |
| UPH12.026.083 SH Z6 HA 2D | 5163386 | ● | 12,00 | 12,00 | 83,00 | 26,00 | - | 6 | HA |
| UPH12.026.083 FR0.5 Z6 HA 2D | 5163387 | ● | 12,00 | 12,00 | 83,00 | 26,00 | 0,50 | 6 | HA |
| UPH12.026.083 FR1.0 Z6 HA 2D | 5163388 | ● | 12,00 | 12,00 | 83,00 | 26,00 | 1,00 | 6 | HA |
| UPH16.032.092 SH Z6 HA 2D | 5163389 | ● | 16,00 | 16,00 | 92,00 | 32,00 | - | 6 | HA |
| UPH16.032.092 FR0.5 Z6 HA 2D | 5163390 | ● | 16,00 | 16,00 | 92,00 | 32,00 | 0,50 | 6 | HA |
| UPH16.032.092 FR1.0 Z6 HA 2D | 5163391 | ● | 16,00 | 16,00 | 92,00 | 32,00 | 1,00 | 6 | HA |
| UPH16.032.092 FR2.0 Z6 HA 2D | 5163392 | ● | 16,00 | 16,00 | 92,00 | 32,00 | 2,00 | 6 | HA |
| UPH20.038.104 SH Z6 HA 2D | 5163393 | ○ | 20,00 | 20,00 | 104,00 | 38,00 | - | 6 | HA |
| UPH20.038.104 FR1.0 Z6 HA 2D | 5163394 | ○ | 20,00 | 20,00 | 104,00 | 38,00 | 1,00 | 6 | HA |
| UPH20.038.104 FR2.0 Z6 HA 2D | 5163402 | ○ | 20,00 | 20,00 | 104,00 | 38,00 | 2,00 | 6 | HA |

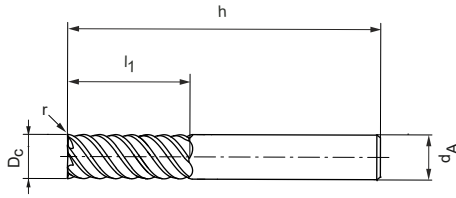
Bestellbeispiel Order example: 1 Stück piece 5163364 oder or UPH04.011.057 SH Z6 HA 2D
 Genaue Schnittwertempfehlung siehe Seite 254
 Detailed cutting recommendations, see page 254

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

UNItec Pro H Finish neck 3xD

Ausführung 3xD scharf, Eckenradius Z6

Execution 3xD sharp, corner radius Z6



| Hard Facts | |
|--------------------|------------------|
| Fräserdurchmesser: | 4,00 - 20,00 mm |
| Beschichtung: | AlTiSiN PVD |
| Schneidenzahl: | Z = 6 |
| Drallwinkel: | 55° |
| Besonderheiten: | Ungleichteilung |
| | |
| Diameter: | 4.00 - 20.00 mm |
| Coating: | AlTiSiN PVD |
| Amount/Teeth: | Z = 6 |
| Helix angle: | 55° |
| Special feature: | Unequal division |

| UNItec Pro H Finish neck 3xD | | |
|------------------------------|-----|-------------------------------------|
| ISO | | |
| P | P.1 | <input type="checkbox"/> |
| | P.2 | <input type="checkbox"/> |
| | P.3 | <input type="checkbox"/> |
| | P.4 | <input type="checkbox"/> |
| | P.5 | <input type="checkbox"/> |
| M | M.1 | <input type="checkbox"/> |
| | M.2 | <input type="checkbox"/> |
| K | K.1 | <input type="checkbox"/> |
| | K.2 | <input type="checkbox"/> |
| | K.3 | <input type="checkbox"/> |
| H | H.1 | <input checked="" type="checkbox"/> |
| | H.2 | <input checked="" type="checkbox"/> |
| | H.3 | <input checked="" type="checkbox"/> |
| | H.4 | <input checked="" type="checkbox"/> |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|--------|----------------|------|---|-----------------|
| | | | D _C | d _A | h | l ₁ | r | | |
| UPH04.016.062 SH Z6 HA 3D | 5163403 | ● | 4,00 | 6,00 | 62,00 | 16,00 | - | 6 | HA |
| UPH04.016.062 FR0.5 Z6 HA 3D | 5163404 | ● | 4,00 | 6,00 | 62,00 | 16,00 | 0,50 | 6 | HA |
| UPH05.017.062 SH Z6 HA 3D | 5163405 | ● | 5,00 | 6,00 | 62,00 | 17,00 | - | 6 | HA |
| UPH05.017.062 FR0.5 Z6 HA 3D | 5163406 | ● | 5,00 | 6,00 | 62,00 | 17,00 | 0,50 | 6 | HA |
| UPH05.017.062 FR1.0 Z6 HA 3D | 5163407 | ● | 5,00 | 6,00 | 62,00 | 17,00 | 1,00 | 6 | HA |
| UPH06.018.062 SH Z6 HA 3D | 5163408 | ● | 6,00 | 6,00 | 62,00 | 18,00 | - | 6 | HA |
| UPH06.018.062 FR0.5 Z6 HA 3D | 5163409 | ● | 6,00 | 6,00 | 62,00 | 18,00 | 0,50 | 6 | HA |
| UPH06.018.062 FR1.0 Z6 HA 3D | 5163410 | ● | 6,00 | 6,00 | 62,00 | 18,00 | 1,00 | 6 | HA |
| UPH08.024.068 SH Z6 HA 3D | 5163412 | ● | 8,00 | 8,00 | 68,00 | 24,00 | - | 6 | HA |
| UPH08.024.068 FR0.5 Z6 HA 3D | 5163413 | ● | 8,00 | 8,00 | 68,00 | 24,00 | 0,50 | 6 | HA |
| UPH08.024.068 FR1.0 Z6 HA 3D | 5163414 | ● | 8,00 | 8,00 | 68,00 | 24,00 | 1,00 | 6 | HA |
| UPH10.030.080 SH Z6 HA 3D | 5163416 | ● | 10,00 | 10,00 | 80,00 | 30,00 | - | 6 | HA |
| UPH10.030.080 FR0.5 Z6 HA 3D | 5163417 | ● | 10,00 | 10,00 | 80,00 | 30,00 | 0,50 | 6 | HA |
| UPH10.030.080 FR1.0 Z6 HA 3D | 5163418 | ● | 10,00 | 10,00 | 80,00 | 30,00 | 1,00 | 6 | HA |
| UPH12.036.093 SH Z6 HA 3D | 5163419 | ● | 12,00 | 12,00 | 93,00 | 36,00 | - | 6 | HA |
| UPH12.036.093 FR0.5 Z6 HA 3D | 5163420 | ● | 12,00 | 12,00 | 93,00 | 36,00 | 0,50 | 6 | HA |
| UPH12.036.093 FR1.0 Z6 HA 3D | 5163421 | ● | 12,00 | 12,00 | 93,00 | 36,00 | 1,00 | 6 | HA |
| UPH16.048.108 SH Z6 HA 3D | 5163422 | ● | 16,00 | 16,00 | 108,00 | 48,00 | - | 6 | HA |
| UPH16.048.108 FR0.5 Z6 HA 3D | 5163423 | ● | 16,00 | 16,00 | 108,00 | 48,00 | 0,50 | 6 | HA |
| UPH16.048.108 FR1.0 Z6 HA 3D | 5163424 | ● | 16,00 | 16,00 | 108,00 | 48,00 | 1,00 | 6 | HA |
| UPH16.048.108 FR2.0 Z6 HA 3D | 5163425 | ● | 16,00 | 16,00 | 108,00 | 48,00 | 2,00 | 6 | HA |
| UPH20.060.126 SH Z6 HA 3D | 5163426 | ○ | 20,00 | 20,00 | 126,00 | 60,00 | - | 6 | HA |
| UPH20.060.126 FR1.0 Z6 HA 3D | 5163427 | ○ | 20,00 | 20,00 | 126,00 | 60,00 | 1,00 | 6 | HA |
| UPH20.060.126 FR2.0 Z6 HA 3D | 5163428 | ○ | 20,00 | 20,00 | 126,00 | 60,00 | 2,00 | 6 | HA |

Bestellbeispiel Order example: 1 Stück piece 5163403 oder or UPH04.016.062 SH Z6 HA 3D

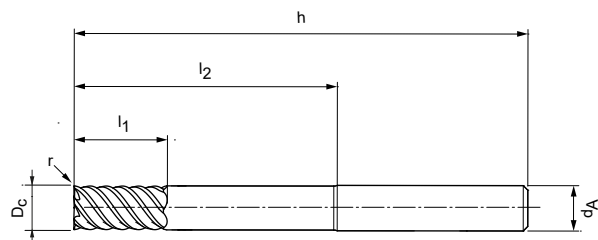
Genauere Schnittwertempfehlung siehe Seite 254

Detailed cutting recommendations, see page 254

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

UNItec Pro H extra long neck

Extra lange Ausführung mit Eckenradius, Z6
Execution extra long with corner radius, Z6



| Hard Facts | |
|--------------------|------------------|
| Fräserdurchmesser: | 6,00 - 20,00 mm |
| Beschichtung: | AlTiSiN PVD |
| Schneidenzahl: | Z = 6 |
| Drallwinkel: | 42° |
| Besonderheiten: | Ungleichteilung |
| | |
| Diameter: | 6.00 - 20.00 mm |
| Coating: | AlTiSiN PVD |
| Amount/Teeth: | Z = 6 |
| Helix angle: | 42° |
| Special feature: | Unequal division |

| UNItec Pro H Finish neck 3xD | | |
|------------------------------|-----|-------------------------------------|
| ISO | | |
| P | P.1 | <input type="checkbox"/> |
| | P.2 | <input type="checkbox"/> |
| | P.3 | <input type="checkbox"/> |
| | P.4 | <input type="checkbox"/> |
| | P.5 | <input type="checkbox"/> |
| M | M.1 | <input type="checkbox"/> |
| | M.2 | <input type="checkbox"/> |
| K | K.1 | <input type="checkbox"/> |
| | K.2 | <input type="checkbox"/> |
| | K.3 | <input type="checkbox"/> |
| H | H.1 | <input checked="" type="checkbox"/> |
| | H.2 | <input checked="" type="checkbox"/> |
| | H.3 | <input checked="" type="checkbox"/> |
| | H.4 | <input checked="" type="checkbox"/> |

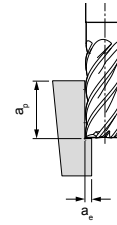
| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|--------|----------------|----------------|------|---|-----------------|
| | | | D _C | d _A | l | l ₁ | l ₂ | r | | |
| UPH06.013.080 SH Z6 HA | 5163430 | ○ | 6,00 | 6,00 | 80,00 | 13,00 | 42,00 | - | 6 | HA |
| UPH06.013.080 FR0.5 Z6 HA | 5163431 | ○ | 6,00 | 6,00 | 80,00 | 13,00 | 42,00 | 0,50 | 6 | HA |
| UPH06.013.080 FR1.0 Z6 HA | 5163432 | ○ | 6,00 | 6,00 | 80,00 | 13,00 | 42,00 | 1,00 | 6 | HA |
| UPH08.021.100 SH Z6 HA | 5163433 | ○ | 8,00 | 8,00 | 100,00 | 21,00 | 62,00 | - | 6 | HA |
| UPH08.021.100 FR0.5 Z6 HA | 5163435 | ○ | 8,00 | 8,00 | 100,00 | 21,00 | 62,00 | 0,50 | 6 | HA |
| UPH08.021.100 FR1.0 Z6 HA | 5163436 | ○ | 8,00 | 8,00 | 100,00 | 21,00 | 62,00 | 1,00 | 6 | HA |
| UPH10.022.100 SH Z6 HA | 5163437 | ○ | 10,00 | 10,00 | 100,00 | 22,00 | 58,00 | - | 6 | HA |
| UPH10.022.100 FR0.5 Z6 HA | 5163438 | ○ | 10,00 | 10,00 | 100,00 | 22,00 | 58,00 | 0,50 | 6 | HA |
| UPH10.022.100 FR1.0 Z6 HA | 5163439 | ○ | 10,00 | 10,00 | 100,00 | 22,00 | 58,00 | 1,00 | 6 | HA |
| UPH12.026.120 SH Z6 HA | 5163440 | ○ | 12,00 | 12,00 | 120,00 | 26,00 | 73,00 | - | 6 | HA |
| UPH12.026.120 FR0.5 Z6 HA | 5163441 | ○ | 12,00 | 12,00 | 120,00 | 26,00 | 73,00 | 0,50 | 6 | HA |
| UPH12.026.120 FR1.0 Z6 HA | 5163443 | ○ | 12,00 | 12,00 | 120,00 | 26,00 | 73,00 | 1,00 | 6 | HA |
| UPH16.036.150 SH Z6 HA | 5163444 | ○ | 16,00 | 16,00 | 150,00 | 36,00 | 100,00 | - | 6 | HA |
| UPH16.036.150 FR0.5 Z6 HA | 5163445 | ○ | 16,00 | 16,00 | 150,00 | 36,00 | 100,00 | 0,50 | 6 | HA |
| UPH16.036.150 FR1.0 Z6 HA | 5163446 | ○ | 16,00 | 16,00 | 150,00 | 36,00 | 100,00 | 1,00 | 6 | HA |
| UPH16.036.150 FR2.0 Z6 HA | 5163447 | ○ | 16,00 | 16,00 | 150,00 | 36,00 | 100,00 | 2,00 | 6 | HA |
| UPH20.041.150 SH Z6 HA | 5163458 | ○ | 20,00 | 20,00 | 150,00 | 41,00 | 98,00 | - | 6 | HA |
| UPH20.041.150 FR1.0 Z6 HA | 5163460 | ○ | 20,00 | 20,00 | 150,00 | 41,00 | 98,00 | 1,00 | 6 | HA |
| UPH20.041.150 FR2.0 Z6 HA | 5163462 | ○ | 20,00 | 20,00 | 150,00 | 41,00 | 98,00 | 2,00 | 6 | HA |

Bestellbeispiel Order example: 1 Stück piece 5163430 oder or UPH06.013.080 SH Z6 HA
Genauere Schnittwertempfehlung siehe Seite 254
Detailed cutting recommendations, see page 254

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

Schnittwertempfehlung für Eckfräser, Vorschub und Schnittgeschwindigkeit
Recommended cutting values for corner milling cutters, feed and cutting speed

Schichten
 Finishing

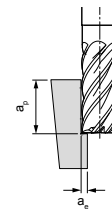


$a_p = 1,5 \times D$
 $a_e = 0,1 \times D$

UNItec Finish extra long Z6

| BZG | | Kühlung Cooling | | | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | | |
|-----|----|---------------------|----------------|-------------|------------------|---|-------|-------|-------|-------|-------|-------|-------|
| | | MMS/Luft MMS/Air | Trocken Dry | Nass Wet | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | |
| | | | | | | 4 | 6 | 8 | 10 | 12 | 16 | 20 | 25 |
| P | P1 | ● | ● | ● | 340 - 415 | 0,050 | 0,070 | 0,091 | 0,110 | 0,128 | 0,160 | 0,186 | 0,206 |
| | P2 | ● | ● | ● | 265 - 380 | 0,050 | 0,070 | 0,091 | 0,110 | 0,128 | 0,160 | 0,186 | 0,206 |
| | P3 | ● | ● | ● | 210 - 245 | 0,047 | 0,067 | 0,086 | 0,104 | 0,122 | 0,152 | 0,177 | 0,196 |
| | P4 | ● | | ● | 170 | 0,033 | 0,047 | 0,060 | 0,073 | 0,085 | 0,107 | 0,124 | 0,137 |
| | P5 | | | ● | 170 - 255 | 0,048 | 0,068 | 0,088 | 0,106 | 0,124 | 0,155 | 0,180 | 0,199 |
| M | M1 | ● | | ● | 115 - 125 | 0,029 | 0,041 | 0,053 | 0,064 | 0,075 | 0,094 | 0,108 | 0,120 |
| | M2 | | | ● | 105 - 115 | 0,024 | 0,034 | 0,044 | 0,053 | 0,062 | 0,077 | 0,090 | 0,099 |
| K | K1 | ● | ● | ● | 455 | 0,083 | 0,117 | 0,151 | 0,183 | 0,214 | 0,267 | 0,310 | 0,343 |
| | K2 | ● | ● | ● | 190 - 415 | 0,070 | 0,100 | 0,128 | 0,156 | 0,182 | 0,227 | 0,263 | 0,292 |
| | K3 | ● | ● | ● | 285 - 300 | 0,058 | 0,082 | 0,106 | 0,128 | 0,149 | 0,187 | 0,217 | 0,240 |

Schichten
 Finishing



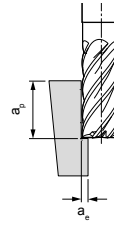
Eintauchwinkel
 Plunge angle
 0,5° - 1,0°

UNItec Pro H Finish neck 2xD SH/FR Z6,
UNItec Pro H Finish neck 3xD SH/FR Z6,
UNItec Pro H Finish extra long neck SH/FR Z6

| BZG | | Kühlung Cooling | | | a_p [mm] | a_e [mm] | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | | | | |
|-----|----|-----------------|---------------------|-----|---------------|---------------|------------------|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | Trocken Dry | Luft/MMS MMS/Air | KSS | | | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | | |
| | | | | | | | | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| P | P1 | ● | ● | ● | 1xD | 0,02xD | 180-220 | 0,025 | 0,030 | 0,040 | 0,050 | 0,065 | 0,075 | 0,090 | 0,105 | 0,118 | 0,131 |
| | P2 | ● | ● | ● | 1xD | 0,02xD | 160-200 | 0,025 | 0,030 | 0,040 | 0,050 | 0,065 | 0,075 | 0,090 | 0,105 | 0,118 | 0,131 |
| | P3 | ● | ● | ● | 1xD | 0,02xD | 140-200 | 0,025 | 0,030 | 0,040 | 0,050 | 0,065 | 0,075 | 0,090 | 0,105 | 0,118 | 0,131 |
| | P4 | | ● | ● | 1xD | 0,02xD | 140-160 | 0,021 | 0,026 | 0,034 | 0,043 | 0,055 | 0,064 | 0,077 | 0,089 | 0,100 | 0,111 |
| | P5 | | ● | ● | 1xD | 0,02xD | 140-170 | 0,021 | 0,026 | 0,034 | 0,043 | 0,055 | 0,064 | 0,077 | 0,089 | 0,100 | 0,111 |
| M | M1 | | | ● | 1xD | 0,018xD | 110-130 | 0,023 | 0,027 | 0,036 | 0,045 | 0,059 | 0,068 | 0,081 | 0,095 | 0,106 | 0,118 |
| | M2 | | | ● | 1xD | 0,015xD | 90-130 | 0,021 | 0,026 | 0,034 | 0,043 | 0,055 | 0,064 | 0,077 | 0,089 | 0,100 | 0,111 |
| K | K1 | ● | ● | ● | 1xD | 0,02xD | 200-220 | 0,025 | 0,030 | 0,040 | 0,050 | 0,065 | 0,075 | 0,090 | 0,105 | 0,118 | 0,131 |
| | K2 | ● | ● | ● | 1xD | 0,02xD | 170-200 | 0,024 | 0,029 | 0,038 | 0,048 | 0,062 | 0,071 | 0,086 | 0,100 | 0,112 | 0,124 |
| | K3 | ● | ● | ● | 1xD | 0,02xD | 180-220 | 0,025 | 0,030 | 0,040 | 0,050 | 0,065 | 0,075 | 0,090 | 0,105 | 0,118 | 0,131 |
| H | H1 | ● | ● | | 1xD | 0,015xD | 90-130 | 0,021 | 0,026 | 0,034 | 0,043 | 0,055 | 0,064 | 0,077 | 0,089 | 0,100 | 0,111 |
| | H2 | | ● | | 1xD | 0,008xD | 80-100 | 0,015 | 0,018 | 0,024 | 0,030 | 0,039 | 0,045 | 0,054 | 0,063 | 0,071 | 0,079 |
| | H3 | | ● | | 1xD | 0,006xD | 60-90 | 0,013 | 0,015 | 0,020 | 0,025 | 0,033 | 0,038 | 0,045 | 0,053 | 0,059 | 0,066 |
| | H4 | ● | ● | | 1xD | 0,008xD | 80-100 | 0,015 | 0,018 | 0,024 | 0,030 | 0,039 | 0,045 | 0,054 | 0,063 | 0,071 | 0,079 |

Schnittwertempfehlung für Eckfräser, Vorschub und Schnittgeschwindigkeit
Recommended cutting values for corner milling cutters, feed and cutting speed

Schlichten
 Finishing



$$a_p = 1,5 \times D$$

$$a_e = 0,1 \times D$$

UNItec Pro Finish long neck Z6/Z8

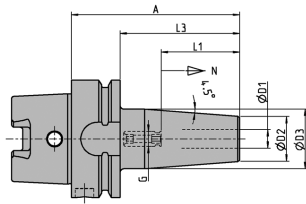
| BZG | Kühlung Cooling | | | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | | | |
|-----|---------------------|----------------|-------------|------------------|---|-------|-------|-------|-------|-------|-------|-------|-------|
| | MMS/Luft MMS/Air | Trocken Dry | Nass Wet | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | |
| | | | | | 2 | 4 | 6 | 8 | 10 | 12 | 16 | 20 | |
| P | P1 | ● | ● | ● | 485 - 595 | 0,062 | 0,035 | 0,062 | 0,088 | 0,113 | 0,137 | 0,160 | 0,257 |
| | P2 | ● | ● | ● | 380 - 540 | 0,062 | 0,035 | 0,062 | 0,088 | 0,113 | 0,137 | 0,160 | 0,257 |
| | P3 | ● | ● | ● | 295 - 350 | 0,059 | 0,033 | 0,059 | 0,084 | 0,108 | 0,131 | 0,152 | 0,244 |
| | P4 | ● | | ● | 245 | 0,041 | 0,023 | 0,041 | 0,059 | 0,076 | 0,092 | 0,107 | 0,172 |
| | P5 | | | ● | 245 - 360 | 0,060 | 0,034 | 0,060 | 0,085 | 0,110 | 0,133 | 0,155 | 0,249 |
| M | M1 | ● | | ● | 160 - 180 | 0,036 | 0,020 | 0,036 | 0,051 | 0,066 | 0,080 | 0,093 | 0,150 |
| | M2 | | | ● | 150 - 160 | 0,030 | 0,017 | 0,030 | 0,043 | 0,055 | 0,066 | 0,077 | 0,124 |
| K | K1 | ● | ● | ● | 650 | 0,103 | 0,058 | 0,103 | 0,147 | 0,189 | 0,229 | 0,267 | 0,429 |
| | K2 | ● | ● | ● | 270 - 595 | 0,088 | 0,050 | 0,088 | 0,125 | 0,161 | 0,195 | 0,227 | 0,365 |
| | K3 | ● | ● | ● | 405 - 430 | 0,072 | 0,041 | 0,072 | 0,103 | 0,132 | 0,160 | 0,187 | 0,300 |

* Angegebene Schnittdaten sind als Richtwert zu sehen, welche durch Versuche für jeden Anwendungsfall separat optimiert werden.
 * Recommended cutting data has to be seen as a reference which can be optimised for each application through trials separately

HSK-Werkzeugaufnahmen für Eckfräsen - Schlichten

HSK-Tool holders for Edge milling finishing

www.boehlerit.com




| Aufnahme HSK-A63 für Schafffräser Chuck HSK-A63 for end milling cutter | | | | Aufnahme HSK-A100 für Schafffräser Chuck HSK-A100 for end milling cutter | | | |
|---|-------------------------------------|-----------------------------|-------------------------------|---|---------------------------------------|-----------------------------|-------------------------------|
| Ø Dc | HSK-A63-Bezeichnung HSK-A63-Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Ø Dc | HSK-A100-Bezeichnung HSK-A100-Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability |
| Ø6 | T0600/HSK-A63 | 6726201 | ○ | Ø6 | T0600/HSK-A100 | 6726342 | ○ |
| Ø8 | T0800/HSK-A63 | 6726202 | ○ | Ø8 | T0800/HSK-A100 | 6726343 | ○ |
| Ø10 | T1000/HSK-A63 | 6726203 | ● | Ø10 | T1000/HSK-A100 | 6726344 | ● |
| Ø12 | T1200/HSK-A63 | 6726204 | ● | Ø12 | T1200/HSK-A100 | 6726345 | ● |
| Ø16 | T1600/HSK-A63 | 6726206 | ● | Ø16 | T1600/HSK-A100 | 6726347 | ● |
| Ø20 | T2000/HSK-A63 | 6726207 | ● | Ø20 | T2000/HSK-A100 | 6726349 | ● |

boehlerit

Trochoidal Fräsen
Trochoidal milling



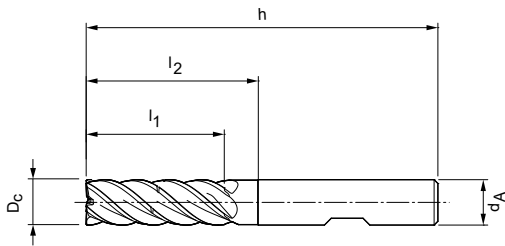
Programmübersicht Trochoidal Fräsen
Program overview trochoidal milling

| Trochoidal Fräsen Trochoidal milling | |
|---|----|
| TROCHotec | |
|  | |
| Zähnezahl Amount teeth | Z5 |
| P.1 | ■ |
| P.2 | ■ |
| P.3 | ■ |
| P.4 | ■ |
| P.5 | ■ |
| P.6 | ■ |
| M.1 | ■ |
| M.2 | ■ |
| K.1 | ■ |
| K.2 | ■ |
| K.3 | ■ |
| S.1 | ■ |
| S.2 | ■ |
| S.3 | ■ |
| S.4 | ■ |
| H.1 | ■ |
| H.2 | ■ |
| H.3 | □ |
| H.4 | □ |

TROCHotec Universal 3xD neck

Ausführung 3xD mit Hals Z5

Execution 3xD neck Z5



| Hard Facts | |
|--------------------|---|
| Fräserdurchmesser: | 4,00 - 25,00 mm |
| Beschichtung: | AlCrN PVD |
| Schneidenzahl: | Z = 5 |
| Drallwinkel: | 41° - 42° |
| Wuchtgüte: | Schneidenanteil gewuchtet auf G2.5 nach DIN ISO 1940-G2.5 |
| Besonderheiten: | Ungleichteilung |
| Diameter: | 4.00 - 25.00 mm |
| Coating: | AlCrN PVD |
| Amount/Teeth: | Z = 5 |
| Helix angle: | 41° - 42° |
| Balance: | Heaved to G2.5 acc. DIN ISO 1940-G2.5 |
| Special feature: | Unequal division |

| TROCHotec Universal 3xD neck | | |
|------------------------------|-----|---|
| ISO | | |
| P | P.1 | ■ |
| | P.2 | ■ |
| | P.3 | ■ |
| | P.4 | ■ |
| | P.5 | ■ |
| M | M.1 | □ |
| | M.2 | □ |
| K | K.1 | ■ |
| | K.2 | ■ |
| | K.3 | ■ |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|--------|----------------|----------------|--------|---|----|-----------------|
| | | | D _C | d _A | h | l ₁ | l ₂ | Cx 45° | | | |
| T04.016.062 Cx Z5 HB | 5163067 | ● | 4,00 | 6,00 | 62,00 | 16,00 | 23,00 | 0,08 | 5 | HB | |
| T05.017.062 Cx Z5 HB | 5163693 | ○ | 5,00 | 6,00 | 62,00 | 17,00 | 24,00 | 0,10 | 5 | HB | |
| T06.018.062 Cx Z5 HB | 5163082 | ● | 6,00 | 6,00 | 62,00 | 18,00 | 25,00 | 0,12 | 5 | HB | |
| T08.024.068 Cx Z5 HB | 5163083 | ● | 8,00 | 8,00 | 68,00 | 24,00 | 30,00 | 0,16 | 5 | HB | |
| T10.030.080 Cx Z5 HB | 5163084 | ● | 10,00 | 10,00 | 80,00 | 30,00 | 35,00 | 0,20 | 5 | HB | |
| T12.036.093 Cx Z5 HB | 5163085 | ● | 12,00 | 12,00 | 93,00 | 36,00 | 45,00 | 0,24 | 5 | HB | |
| T14.042.099 Cx Z5 HB | 5163694 | ○ | 14,00 | 14,00 | 99,00 | 42,00 | 50,00 | 0,28 | 5 | HB | |
| T16.048.108 Cx Z5 HB | 5163087 | ● | 16,00 | 16,00 | 108,00 | 48,00 | 55,00 | 0,32 | 5 | HB | |
| T18.054.117 Cx Z5 HB | 5163695 | ○ | 18,00 | 18,00 | 117,00 | 54,00 | 67,00 | 0,36 | 5 | HB | |
| T20.060.126 Cx Z5 HB | 5163088 | ● | 20,00 | 20,00 | 126,00 | 60,00 | 70,00 | 0,40 | 5 | HB | |
| T25.075.150 Cx Z5 HB | 5163696 | ○ | 25,00 | 25,00 | 150,00 | 75,00 | 92,00 | 0,50 | 5 | HB | |

Bestellbeispiel Order example: 1 Stück piece 5163067 oder or T04.016.062 Cx Z5 HB

Genaue Schnittwertempfehlung siehe Seite 265

Detailed cutting recommendations, see page 265

● Verfügbar ab Lager Available from stock

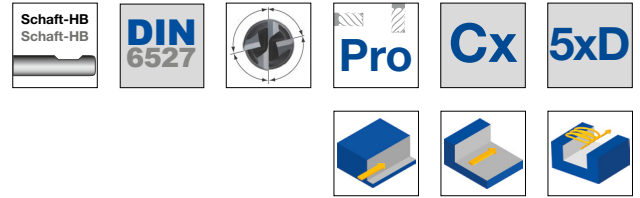
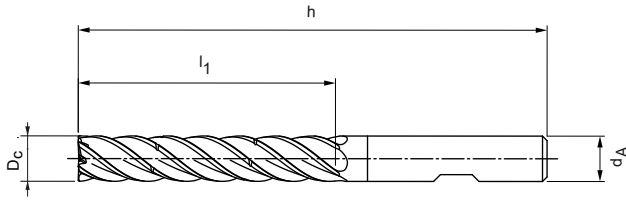
○ Kurzfristig lieferbar Shortly available

○ Lieferzeit auf Anfrage Delivery time on request

TROCHotec Universal 5xD

Ausführung 5xD Z5

Execution 5xD Z5



| Hard Facts | |
|--------------------|---|
| Fräserdurchmesser: | 8,00 - 25,00 mm |
| Beschichtung: | AlCrN PVD |
| Schneidenzahl: | Z = 5 |
| Drallwinkel: | ~41° |
| Wuchtgüte: | Schneidenanteil gewuchtet auf G2.5 nach DIN ISO 1940-G2.5 |
| Besonderheiten: | Ungleichteilung |
| Diameter: | 8.00 - 25.00 mm |
| Coating: | AlCrN PVD |
| Amount/Teeth: | Z = 5 |
| Helix angle: | ~41° |
| Balance: | Heaved to G2.5 acc. DIN ISO 1940-G2.5 |
| Special feature: | Unequal division |

| TROCHotec Universal 5xD neck | | |
|------------------------------|-----|---|
| ISO | | |
| P | P.1 | ■ |
| | P.2 | ■ |
| | P.3 | ■ |
| | P.4 | ■ |
| | P.5 | ■ |
| M | M.1 | □ |
| | M.2 | □ |
| K | K.1 | ■ |
| | K.2 | ■ |
| | K.3 | ■ |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|--------|----------------|--------|---|-----------------|
| | | | D _c | d _A | h | l ₁ | Cx 45° | | |
| T08.040.081 Cx Z5 HB | 5163697 | ● | 8,00 | 8,00 | 81,00 | 40,00 | 0,16 | 5 | HB |
| T10.050.096 Cx Z5 HB | 5163698 | ● | 10,00 | 10,00 | 96,00 | 50,00 | 0,20 | 5 | HB |
| T12.060.112 Cx Z5 HB | 5163699 | ● | 12,00 | 12,00 | 112,00 | 60,00 | 0,24 | 5 | HB |
| T14.070.122 Cx Z5 HB | 5163700 | ○ | 14,00 | 14,00 | 122,00 | 70,00 | 0,28 | 5 | HB |
| T16.080.136 Cx Z5 HB | 5163701 | ● | 16,00 | 16,00 | 136,00 | 80,00 | 0,32 | 5 | HB |
| T18.090.147 Cx Z5 HB | 5163702 | ○ | 18,00 | 18,00 | 147,00 | 90,00 | 0,36 | 5 | HB |
| T20.100.160 Cx Z5 HB | 5163704 | ● | 20,00 | 20,00 | 160,00 | 100,00 | 0,40 | 5 | HB |
| T25.125.195 Cx Z5 HB | 5163705 | ● | 25,00 | 25,00 | 195,00 | 125,00 | 0,50 | 5 | HB |

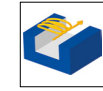
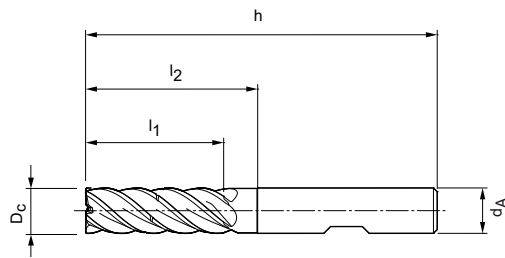
Bestellbeispiel Order example: 1 Stück piece 5163697 oder or T08.040.081 Cx Z5 HB
 Genaue Schnittwertempfehlung siehe Seite 265
 Detailed cutting recommendations, see page 265

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

TROCHotec PM 3xD neck

Ausführung 3xD mit Hals Z5

Execution 3xD neck Z5



| Hard Facts | |
|--------------------|---|
| Fräserdurchmesser: | 4,00 - 25,00 mm |
| Beschichtung: | AlCrN PVD |
| Schneidenzahl: | Z = 5 |
| Drallwinkel: | 41° - 42° |
| Wuchtgüte: | Schneidenanteil gewuchtet auf G2.5 nach DIN ISO 1940-G2.5 |
| Besonderheiten: | Ungleichteilung |
| Diameter: | 4.00 - 25.00 mm |
| Coating: | AlCrN PVD |
| Amount/Teeth: | Z = 5 |
| Helix angle: | 41° - 42° |
| Balance: | Heaved to G2.5 acc. DIN ISO 1940-G2.5 |
| Special feature: | Unequal division |

| TROCHotec PM 3xD neck | | |
|-----------------------|-----|---|
| ISO | | |
| P | P.1 | ■ |
| | P.2 | ■ |
| | P.3 | ■ |
| | P.4 | ■ |
| | P.5 | ■ |
| M | M.1 | ■ |
| | M.2 | ■ |
| K | K.1 | ■ |
| | K.2 | ■ |
| | K.3 | ■ |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|--------|----------------|----------------|--------|---|-----------------|
| | | | D _C | d _A | h | l ₁ | l ₂ | Cx 45° | | |
| TP04.016.062 Cx Z5 HB | 5163089 | ● | 4,00 | 6,00 | 62,00 | 16,00 | 23,00 | 0,08 | 5 | HB |
| TP05.017.062 Cx Z5 HB | 5163706 | ⦿ | 5,00 | 6,00 | 62,00 | 17,00 | 24,00 | 0,10 | 5 | HB |
| TP06.018.062 Cx Z5 HB | 5163090 | ● | 6,00 | 6,00 | 62,00 | 18,00 | 25,00 | 0,12 | 5 | HB |
| TP08.024.068 Cx Z5 HB | 5163091 | ● | 8,00 | 8,00 | 68,00 | 24,00 | 30,00 | 0,16 | 5 | HB |
| TP10.030.080 Cx Z5 HB | 5163093 | ● | 10,00 | 10,00 | 80,00 | 30,00 | 35,00 | 0,20 | 5 | HB |
| TP12.036.093 Cx Z5 HB | 5163095 | ● | 12,00 | 12,00 | 93,00 | 36,00 | 45,00 | 0,24 | 5 | HB |
| TP14.042.099 Cx Z5 HB | 5163707 | ⦿ | 14,00 | 14,00 | 99,00 | 42,00 | 50,00 | 0,28 | 5 | HB |
| TP16.048.108 Cx Z5 HB | 5163096 | ● | 16,00 | 16,00 | 108,00 | 48,00 | 55,00 | 0,32 | 5 | HB |
| TP18.054.117 Cx Z5 HB | 5163708 | ⦿ | 18,00 | 18,00 | 117,00 | 54,00 | 67,00 | 0,36 | 5 | HB |
| TP20.060.126 Cx Z5 HB | 5163097 | ● | 20,00 | 20,00 | 126,00 | 60,00 | 70,00 | 0,40 | 5 | HB |
| TP25.075.150 Cx Z5 HB | 5163711 | ⦿ | 25,00 | 25,00 | 150,00 | 75,00 | 92,00 | 0,50 | 5 | HB |

Bestellbeispiel Order example: 1 Stück piece 5163089 oder or TP04.016.062 Cx Z5 HB

Genaue Schnittwertempfehlung siehe Seite 265

Detailed cutting recommendations, see page 265

● Verfügbar ab Lager Available from stock

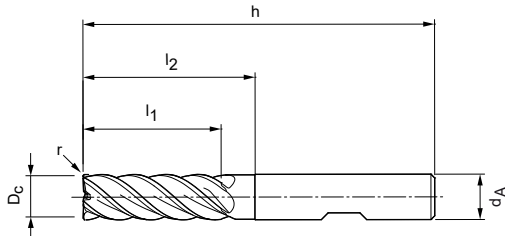
⦿ Kurzfristig lieferbar Shortly available

○ Lieferzeit auf Anfrage Delivery time on request

TROCHotec S 3xD neck

Ausführung 3xD mit Hals Z5

Execution 3xD neck Z5



| Hard Facts | |
|--------------------|---|
| Fräserdurchmesser: | 5,00 - 25,00 mm |
| Beschichtung: | TiAlN PVD |
| Schneidenzahl: | Z = 5 |
| Drallwinkel: | 41° - 42° |
| Wuchtgüte: | Schneidenanteil gewuchtet auf G2.5 nach DIN ISO 1940-G2.5 |
| Besonderheiten: | Ungleichteilung |
| Diameter: | 5.00 - 25.00 mm |
| Coating: | TiAlN PVD |
| Amount/Teeth: | Z = 5 |
| Helix angle: | 41° - 42° |
| Balance: | Heaved to G2.5 acc. DIN ISO 1940-G2.5 |
| Special feature: | Unequal division |

| TROCHotec S 3xD neck | | |
|----------------------|-----|-------------------------------------|
| ISO | | |
| M | M.1 | <input type="checkbox"/> |
| | M.2 | <input type="checkbox"/> |
| S | S.1 | <input type="checkbox"/> |
| | S.2 | <input checked="" type="checkbox"/> |
| | S.3 | <input checked="" type="checkbox"/> |
| | S.4 | <input checked="" type="checkbox"/> |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|--------|----------------|----------------|------|---|-----------------|
| | | | D _C | d _A | h | l ₁ | l ₂ | r | | |
| TS05.017.062 Cr Z5 HB | 5163712 | ○ | 5,00 | 6,00 | 62,00 | 17,00 | 24,00 | 0,10 | 5 | HB |
| TS06.018.062 Cr Z5 HB | 5163099 | ● | 6,00 | 6,00 | 62,00 | 18,00 | 25,00 | 0,10 | 5 | HB |
| TS08.024.068 Cr Z5 HB | 5163100 | ● | 8,00 | 8,00 | 68,00 | 24,00 | 30,00 | 0,20 | 5 | HB |
| TS10.030.080 Cr Z5 HB | 5163101 | ● | 10,00 | 10,00 | 80,00 | 30,00 | 35,00 | 0,20 | 5 | HB |
| TS12.036.093 Cr Z5 HB | 5163103 | ● | 12,00 | 12,00 | 93,00 | 36,00 | 45,00 | 0,30 | 5 | HB |
| TS14.042.099 Cr Z5 HB | 5163713 | ○ | 14,00 | 14,00 | 99,00 | 42,00 | 50,00 | 0,30 | 5 | HB |
| TS16.048.108 Cr Z5 HB | 5163111 | ● | 16,00 | 16,00 | 108,00 | 48,00 | 55,00 | 0,30 | 5 | HB |
| TS18.054.117 Cr Z5 HB | 5163715 | ○ | 18,00 | 18,00 | 117,00 | 54,00 | 67,00 | 0,30 | 5 | HB |
| TS20.060.126 Cr Z5 HB | 5163112 | ● | 20,00 | 20,00 | 126,00 | 60,00 | 70,00 | 0,30 | 5 | HB |
| TS25.075.150 Cr Z5 HB | 5163716 | ○ | 25,00 | 25,00 | 150,00 | 75,00 | 92,00 | 0,40 | 5 | HB |

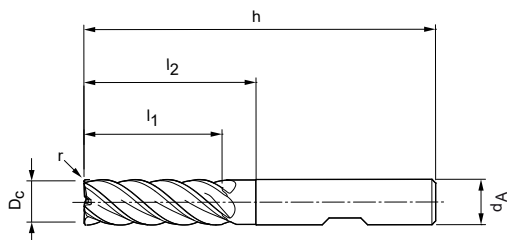
Bestellbeispiel Order example: 1 Stück piece 5163712 oder or TS05.017.062 Cr Z5 HB
 Genaue Schnittwertempfehlung siehe Seite 265
 Detailed cutting recommendations, see page 265

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

TROCHotec T 3xD neck

Ausführung 3xD mit Hals Z5

Execution 3xD neck Z5



| Hard Facts | |
|--------------------|---|
| Fräserdurchmesser: | 5,00 - 25,00 mm |
| Beschichtung: | TiCCrN PVD |
| Schneidenzahl: | Z = 5 |
| Drallwinkel: | 41° - 42° |
| Wuchtgüte: | Schneidenanteil gewuchtet auf G2.5 nach DIN ISO 1940-G2.5 |
| Besonderheiten: | Ungleichteilung |
| Diameter: | 5.00 - 25.00 mm |
| Coating: | TiCCrN PVD |
| Amount/Teeth: | Z = 5 |
| Helix angle: | 41° - 42° |
| Balance: | Heaved to G2.5 acc. DIN ISO 1940-G2.5 |
| Special feature: | Unequal division |

| TROCHotec T 3xD neck | | |
|----------------------|-----|---|
| ISO | | |
| S | S.1 | ■ |
| | S.2 | ■ |
| | S.3 | □ |
| | S.4 | □ |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|--------|----------------|----------------|------|---|-----------------|
| | | | D _C | d _A | h | l ₁ | l ₂ | r | | |
| TT05.017.062 Cr Z5 HB | 5163717 | ○ | 5,00 | 6,00 | 62,00 | 17,00 | 24,00 | 0,10 | 5 | HB |
| TT06.018.062 Cr Z5 HB | 5163718 | ○ | 6,00 | 6,00 | 62,00 | 18,00 | 25,00 | 0,10 | 5 | HB |
| TT08.024.068 Cr Z5 HB | 5163719 | ● | 8,00 | 8,00 | 68,00 | 24,00 | 30,00 | 0,20 | 5 | HB |
| TT10.030.080 Cr Z5 HB | 5163720 | ○ | 10,00 | 10,00 | 80,00 | 30,00 | 35,00 | 0,20 | 5 | HB |
| TT12.036.093 Cr Z5 HB | 5163721 | ● | 12,00 | 12,00 | 93,00 | 36,00 | 45,00 | 0,30 | 5 | HB |
| TT14.042.099 Cr Z5 HB | 5163722 | ○ | 14,00 | 14,00 | 99,00 | 42,00 | 50,00 | 0,30 | 5 | HB |
| TT16.048.108 Cr Z5 HB | 5163723 | ○ | 16,00 | 16,00 | 108,00 | 48,00 | 55,00 | 0,30 | 5 | HB |
| TT18.054.117 Cr Z5 HB | 5163724 | ○ | 18,00 | 18,00 | 117,00 | 54,00 | 67,00 | 0,30 | 5 | HB |
| TT20.060.126 Cr Z5 HB | 5163725 | ○ | 20,00 | 20,00 | 126,00 | 60,00 | 70,00 | 0,30 | 5 | HB |
| TT25.075.150 Cr Z5 HB | 5163726 | ○ | 25,00 | 25,00 | 150,00 | 75,00 | 92,00 | 0,40 | 5 | HB |

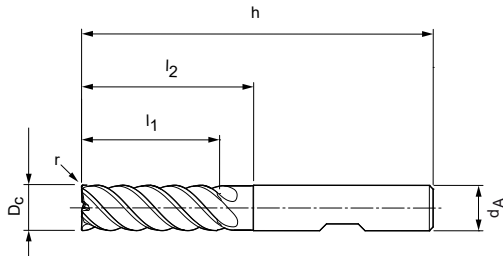
Bestellbeispiel Order example: 1 Stück piece 5163717 oder or TT05.017.062 Cr Z5 HB
 Genaue Schnittwertempfehlung siehe Seite 265
 Detailed cutting recommendations, see page 265

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

TROCHotec H 3xD neck

Ausführung 3xD mit Hals Z5

Execution 3xD neck Z5



| Hard Facts | |
|--------------------|---|
| Fräserdurchmesser: | 5,00 - 25,00 mm |
| Beschichtung: | AlTiSiN PVD |
| Schneidenzahl: | Z = 5 |
| Drallwinkel: | 41° - 42° |
| Wuchtgüte: | Schneidenanteil gewuchtet auf G2.5 nach DIN ISO 1940-G2.5 |
| Besonderheiten: | Ungleichteilung |
| Diameter: | 5.00 - 25.00 mm |
| Coating: | AlTiSiN PVD |
| Amount/Teeth: | Z = 5 |
| Helix angle: | 41° - 42° |
| Balance: | Heaved to G2.5 acc. DIN ISO 1940-G2.5 |
| Special feature: | Unequal division |

| TROCHotec H 3xD neck | | |
|----------------------|-----|---|
| ISO | | |
| H | H.1 | ■ |
| | H.2 | ■ |
| | H.3 | □ |
| | H.4 | □ |

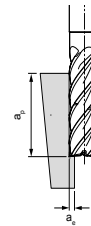
| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|--------|----------------|----------------|------|---|-----------------|
| | | | D _c | d _A | h | l ₁ | l ₂ | r | | |
| TH05.017.062 Cr Z5 HB | 5163727 | ○ | 5,00 | 6,00 | 62,00 | 17,00 | 24,00 | 0,10 | 5 | HB |
| TH06.018.062 Cr Z5 HB | 5163113 | ● | 6,00 | 6,00 | 62,00 | 18,00 | 25,00 | 0,10 | 5 | HB |
| TH08.024.068 Cr Z5 HB | 5163114 | ● | 8,00 | 8,00 | 68,00 | 24,00 | 30,00 | 0,20 | 5 | HB |
| TH10.030.080 Cr Z5 HB | 5163115 | ● | 10,00 | 10,00 | 80,00 | 30,00 | 35,00 | 0,20 | 5 | HB |
| TH12.036.093 Cr Z5 HB | 5163116 | ● | 12,00 | 12,00 | 93,00 | 36,00 | 45,00 | 0,30 | 5 | HB |
| TH14.042.099 Cr Z5 HB | 5163728 | ⊙ | 14,00 | 14,00 | 99,00 | 42,00 | 50,00 | 0,30 | 5 | HB |
| TH16.048.108 Cr Z5 HB | 5163118 | ● | 16,00 | 16,00 | 108,00 | 48,00 | 55,00 | 0,30 | 5 | HB |
| TH18.054.117 Cr Z5 HB | 5163551 | ○ | 18,00 | 18,00 | 117,00 | 54,00 | 67,00 | 0,30 | 5 | HB |
| TH20.060.126 Cr Z5 HB | 5163122 | ● | 20,00 | 20,00 | 126,00 | 60,00 | 70,00 | 0,30 | 5 | HB |
| TH25.075.150 Cr Z5 HB | 5163552 | ○ | 25,00 | 25,00 | 150,00 | 75,00 | 92,00 | 0,40 | 5 | HB |

Bestellbeispiel Order example: 1 Stück piece 5163727 oder or TH05.017.062 Cr Z5 HB
 Genaue Schnittwertempfehlung siehe Seite 265
 Detailed cutting recommendations, see page 265

- Verfügbar ab Lager Available from stock
- ⊙ Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

Schnittwertempfehlung für Eckfräser, Vorschub und Schnittgeschwindigkeit
Recommended cutting values for corner milling cutters, feed and cutting speed

Trochoides Fräsen
Trochoidal milling



$a_p = \max. 3 \times D$
 $a_e = \text{abhängig vom Werkstoff}$
depending on material

TROCHotec Universal 3xD neck Z5, 5xD neck Z5
TROCHotec PM 3xD neck Z5

| BZG | Kühlung Cooling | | | v_c [m/min] | f_z [mm/Zahn] in % vom D f_z [mm/tooth] in % of D | a_e [mm] in % vom D in % of D | h_m [mm] in % vom D in % of D | Bearbeitungsbeispiel Machining example |
|-----|---------------------|----------------|-------------|---------------|--|---------------------------------------|---------------------------------------|--|
| | MMS/Luft MMS/Air | Trocken Dry | Nass Wet | | | | | |
| P | P1 | ● | ● | 320 - 520 | 2,0-2,6 | 14-18 | 0,66-0,8 | 16MnCr5 $\phi = 12$ mm $v_c = 500$ m/min $f_z = 0,28$ mm $a_e = 1,8$ mm $a_p = 32$ mm 42CrMo4 $\phi = 12$ mm $v_c = 375$ m/min $f_z = 0,17$ mm $a_e = 1,2$ mm $a_p = 32$ mm |
| | P2 | ● | ● | 280 - 480 | 1,8-2,4 | 10-14 | 0,58-0,71 | |
| | P3 | ● | ● | 210 - 350 | 1,5-2,2 | 8-14 | 0,54-0,65 | |
| | P4 | ● | ● | 180-260 | 1,0-1,8 | 6-12 | 0,5-0,6 | |
| | P5 | | | 160 - 300 | 1,4-2,0 | 8-12 | 0,54-0,62 | |
| M | M1 | ● | ● | 130 - 220 | 0,6-1,0 | 5-10 | 0,48-0,6 | X5CrNi18-10 $\phi = 12$ mm $v_c = 180$ m/min $f_z = 0,09$ mm $a_e = 1,2$ mm $a_p = 32$ mm |
| | M2 | | ● | 120 - 180 | 0,6-1,0 | 5-10 | 0,46-0,58 | |
| K | K1 | ● | ● | 400-500 | 2,0-2,6 | 15-20 | 0,64-0,78 | |
| | K2 | ● | ● | 180 - 500 | 1,8-2,4 | 12-16 | 0,62-0,7 | |
| | K3 | ● | ● | 210 - 360 | 1,6-2,2 | 10-16 | 0,6-0,68 | |

TROCHotec S 3xD neck Z5, T 3xD neck Z5

| BZG | Kühlung Cooling | | | v_c [m/min] | f_z [mm/Zahn] in % vom D f_z [mm/tooth] in % of D | a_e [mm] in % vom D in % of D | h_m [mm] in % vom D in % of D | Bearbeitungsbeispiel Machining example |
|-----|---------------------|----------------|-------------|---------------|--|---------------------------------------|---------------------------------------|--|
| | MMS/Luft MMS/Air | Trocken Dry | Nass Wet | | | | | |
| M | M1 | ● | ● | 130-220 | 0,6-1,0 | 5-10 | 0,48-0,6 | X5CrNi18-10 $\phi = 12$ mm $v_c = 180$ m/min $f_z = 0,09$ mm $a_e = 1,2$ mm $a_p = 32$ mm |
| | M2 | | ● | 110-180 | 0,6-1,0 | 5-10 | 0,46-0,58 | |
| S | S1 | | ● | 110-170 | 0,65-1,3 | 6-12 | 0,52-0,6 | TiAl6V4 $\phi = 12$ mm $v_c = 140$ m/min $f_z = 0,09$ mm $a_e = 1,2$ mm $a_p = 30$ mm |
| | S2 | | ● | 70 - 150 | 0,6-1,2 | 5-10 | 0,46-0,56 | |
| | S3 | | ● | 50 - 120 | 0,4-1,0 | 5-10 | 0,4-0,52 | |
| | S4 | | ● | 35-90 | 0,3-0,8 | 4-8 | 0,38-0,46 | |

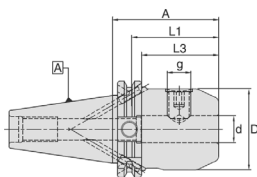
TROCHotec H 3xD neck Z5

| BZG | Kühlung Cooling | | | v_c [m/min] | f_z [mm/Zahn] in % vom D f_z [mm/tooth] in % of D | a_e [mm] in % vom D in % of D | h_m [mm] in % vom D in % of D | Bearbeitungsbeispiel Machining example |
|-----|---------------------|----------------|-------------|---------------|--|---------------------------------------|---------------------------------------|---|
| | MMS/Luft MMS/Air | Trocken Dry | Nass Wet | | | | | |
| H | H1 | ● | ● | 80-140 | 0,45-0,65 | 7-12 | 0,42-0,52 | X155CrVMo12-1 $\phi = 12$ mm $v_c = 110$ m/min $f_z = 0,052$ mm $h_m = 0,04$ mm $a_e = 1$ mm |
| | H2 | ● | ● | 60-120 | 0,4-0,52 | 6-12 | 0,4-0,5 | |
| | H3 | ● | ● | 50-100 | 0,3-0,5 | 5-10 | 0,38-0,46 | |
| | H4 | ● | ● | 60-120 | 0,35-0,55 | 6-12 | 0,4-0,48 | |

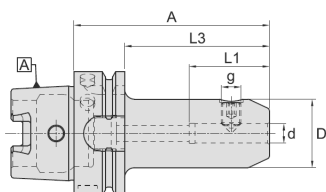
* Angegebene Schnittdaten sind als Richtwert zu sehen, welche durch Versuche für jeden Anwendungsfall separat optimiert werden.
* Recommended cutting data has to be seen as a reference which can be optimised for each application through trials separately

SK- und HSK- Werkzeugaufnahmen für Trochoidal Fräsen

SK- und HSK- Tool holders for Trochoidal milling



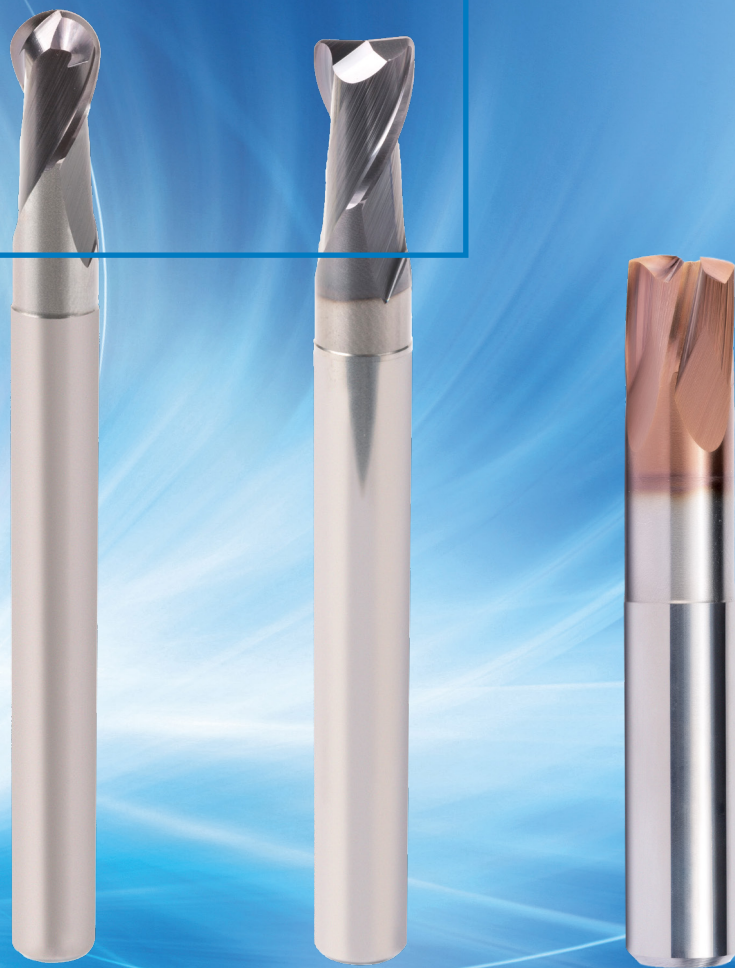
| Aufnahme SK40 für Schaftfräser Chuck SK40 for end milling cutter | | | | | | | |
|---|---------------------------------|-----------------------------|-------------------------------|------|---------------------------------|-----------------------------|-------------------------------|
| Ø Dc | SK-40-Bezeichnung SK-40-Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Ø Dc | SK-40-Bezeichnung SK-40-Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability |
| Ø6 | WSLH/06-50/SK-40 | 4600745 | ○ | Ø16 | WSLH/16-35/SK-40 | 4600771 | ● |
| Ø8 | WSLH/08-50/SK-40 | 4600750 | ○ | Ø18 | WSLH/18-63/SK-40 | 4600776 | ○ |
| Ø10 | WSLH/10-50/SK-40 | 4600755 | ○ | Ø20 | WSLH/20-35/SK-40 | 4600782 | ● |
| Ø12 | WSLH/12-50/SK-40 | 4600760 | ○ | Ø25 | WSLH/25-35/SK-40 | 4600788 | ● |
| Ø14 | WSLH/14-50/SK-40 | 4600770 | ○ | | | | |





| Aufnahme HSK-A63 für Schaftfräser Chuck HSK-A63 for end milling cutter | | | | Aufnahme HSK-A100 für Schaftfräser Chuck HSK-A100 for end milling cutter | | | |
|---|-------------------------------------|-----------------------------|-------------------------------|---|---------------------------------------|-----------------------------|-------------------------------|
| Ø Dc | HSK-A63-Bezeichnung HSK-A63-Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Ø Dc | HSK-A100-Bezeichnung HSK-A100-Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability |
| Ø6 | WSLH/06-65/HSK-A63 | 4601702 | ○ | Ø6 | WSLH/06-80/HSK-A100 | 4601614 | ○ |
| Ø8 | WSLH/08-65/HSK-A63 | 4601705 | ○ | Ø8 | WSLH/08-80/HSK-A100 | 4601616 | ○ |
| Ø10 | WSLH/10-65/HSK-A63 | 4601708 | ○ | Ø10 | WSLH/10-80/HSK-A100 | 4601618 | ○ |
| Ø12 | WSLH/12-80/HSK-A63 | 4601711 | ○ | Ø12 | WSLH/12-80/HSK-A100 | 4601620 | ○ |
| Ø14 | WSLH/14-80/HSK-A63 | 4601715 | ○ | Ø14 | WSLH/14-80/HSK-A100 | 4601622 | ○ |
| Ø16 | WSLH/16-80/HSK-A63 | 4601719 | ○ | Ø16 | WSLH/16-100/HSK-A100 | 4601624 | ● |
| Ø18 | WSLH/18-80/HSK-A63 | 4601723 | ○ | Ø18 | WSLH/18-100/HSK-A100 | 4601626 | ○ |
| Ø20 | WSLH/20-80/HSK-A63 | 4601727 | ● | Ø20 | WSLH/20-100/HSK-A100 | 4601628 | ● |
| Ø20 | WSLH/20-100/HSK-A63 | 5065495 | ○ | Ø25 | WSLH/25-100/HSK-A100 | 4601630 | ● |
| Ø25 | WSLH/25-110/HSK-A63 | 4601730 | ● | | | | |

boehlerit

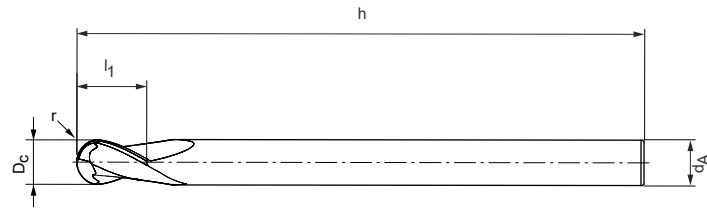
3D - Fräsen Vollhartmetall
3D - Milling solid carbide



| 3D - Fräsen 3D - Milling | | | | |
|-----------------------------|---|---|--|---|
| | BALLtec | TORROtec SC | FEEDtec | UNItec Pro |
| |  |  |  |  |
| Zähnezahl Amount teeth | Z2, Z4 | Z2 | Z4, Z6 | Z4, Z5 |
| P.1 | ■ | ■ | ■ | ■ |
| P.2 | ■ | ■ | ■ | ■ |
| P.3 | ■ | ■ | ■ | ■ |
| P.4 | ■ | ■ | ■ | ■ |
| P.5 | ■ | ■ | ■ | ■ |
| M.1 | □ | □ | | |
| M.2 | □ | □ | | |
| K.1 | □ | □ | ■ | ■ |
| K.2 | □ | □ | ■ | ■ |
| K.3 | □ | | | |
| N.1 | ■ | ■ | | |
| N.2 | ■ | ■ | | |
| N.3 | □ | □ | | |
| N.4 | ■ | | | |
| H.1 | ■ | ■ | ■ | ■ |
| H.2 | ■ | ■ | ■ | ■ |
| H.3 | ■ | ■ | ■ | ■ |
| H.4 | ■ | ■ | ■ | ■ |

BALLtec SC Universal

Kugelfräser „Form B“ Z2
Ballnose cutter „Form B“ Z2



| Hard Facts | |
|--------------------|--|
| Fräserdurchmesser: | 6,00 - 10,00 mm |
| Beschichtung: | AlCrN PVD |
| Schneidenzahl: | Z = 2 |
| Drallwinkel: | 28° |
| Radiusgenauigkeit: | R = ± 0,005 bis ø 6 mm R = ± 0,01 ab ø 8 mm |
| Anwendung: | Geeignet zur Bearbeitung von Werkstoffen bis 55 HRC. |
| Diameter: | 6.00 - 10.00 mm |
| Coating: | AlCrN PVD |
| Amount/Teeth: | Z = 2 |
| Helix angle: | 28° |
| Tolerance: | R = ± 0.005 until ø 6 mm R = ± 0.01 from ø 8 mm |
| Application: | Machining of materials up to 55 HRC. |

| BALLtec SC Universal | | |
|----------------------|-----|---|
| ISO | | |
| P | P.1 | ■ |
| | P.2 | ■ |
| | P.3 | ■ |
| | P.4 | ■ |
| | P.5 | ■ |
| M | M.1 | □ |
| | M.2 | □ |
| K | K.1 | □ |
| | K.2 | □ |
| | K.3 | □ |
| H | H.1 | ■ |
| | H.2 | □ |

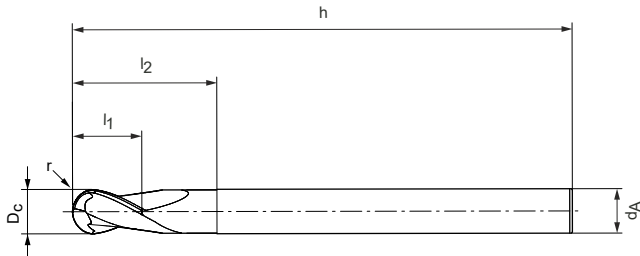
| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|-------|----------------|------|---|-----------------|
| | | | D _c | d _A | l | l ₁ | r | | |
| BCU006.006.060 FR3.0 Z2 HA B | 5164114 | ● | 6,00 | 6,00 | 60,00 | 6,00 | 3,00 | 2 | HA |
| BCU008.008.064 FR4.0 Z2 HA B | 5164116 | ● | 8,00 | 8,00 | 64,00 | 8,00 | 4,00 | 2 | HA |
| BCU010.010.075 FR5.0 Z2 HA B | 5164117 | ● | 10,00 | 10,00 | 75,00 | 10,00 | 5,00 | 2 | HA |

Bestellbeispiel Order example: 1 Stück piece 5164114 oder or BCU006.006.060 FR3.0 Z2 HA B
Genauere Schnittwertempfehlung siehe Seite 295
Detailed cutting recommendations, see page 295

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

BALLtec SC Universal

Kugelfräser mit Hals „Form B“ Z2
Ballnose cutter neck „Form B“ Z2



| Hard Facts | |
|--------------------|--|
| Fräserdurchmesser: | 0,40 - 6,00 mm |
| Beschichtung: | AlCrN PVD |
| Schneidenzahl: | Z = 2 |
| Drallwinkel: | 28° |
| Radiusgenauigkeit: | R = ± 0,005 bis ø 6 mm R = ± 0,01 ab ø 8 mm |
| Anwendung: | Geeignet zur Bearbeitung von Werkstoffen bis 55 HRC. |
| Diameter: | 0.40 - 6.00 mm |
| Coating: | AlCrN PVD |
| Amount/Teeth: | Z = 2 |
| Helix angle: | 28° |
| Tolerance: | R = ± 0.005 until ø 6 mm R = ± 0.01 from ø 8 mm |
| Application: | Machining of materials up to 55 HRC. |

| BALLtec SC Universal | | |
|----------------------|-----|---|
| ISO | | |
| P | P.1 | ■ |
| | P.2 | ■ |
| | P.3 | ■ |
| | P.4 | ■ |
| | P.5 | ■ |
| M | M.1 | □ |
| | M.2 | □ |
| K | K.1 | □ |
| | K.2 | □ |
| | K.3 | □ |
| H | H.1 | □ |
| | H.2 | □ |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | z | Schaft Shank |
|-------------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|-------|----------------|----------------|------|---|-----------------|
| | | | D _c | d _A | h | l ₁ | l ₂ | r | | |
| BCU00.4.00.4.050 FR0.2 Z2 00.7 HA B | 5164235 | ● | 0,40 | 4,00 | 50,00 | 0,40 | 0,75 | 0,20 | 2 | HA |
| BCU00.4.00.4.050 FR0.2 Z2 001 HA B | 5164238 | ● | 0,40 | 4,00 | 50,00 | 0,40 | 1,00 | 0,20 | 2 | HA |
| BCU00.4.00.4.050 FR0.2 Z2 01.5 HA B | 5164118 | ● | 0,40 | 4,00 | 50,00 | 0,40 | 1,50 | 0,20 | 2 | HA |
| BCU00.4.00.4.050 FR0.2 Z2 002 HA B | 5164242 | ● | 0,40 | 4,00 | 50,00 | 0,40 | 2,00 | 0,20 | 2 | HA |
| BCU00.5.00.5.050 FR0.3 Z2 01.5 HA B | 5164243 | ● | 0,50 | 4,00 | 50,00 | 0,50 | 1,50 | 0,25 | 2 | HA |
| BCU00.5.00.5.050 FR0.3 Z2 002 HA B | 5164244 | ● | 0,50 | 4,00 | 50,00 | 0,50 | 2,00 | 0,25 | 2 | HA |
| BCU00.5.00.5.050 FR0.3 Z2 003 HA B | 5164119 | ● | 0,50 | 4,00 | 50,00 | 0,50 | 3,00 | 0,25 | 2 | HA |
| BCU00.5.00.5.050 FR0.3 Z2 004 HA B | 5164245 | ● | 0,50 | 4,00 | 50,00 | 0,50 | 4,00 | 0,25 | 2 | HA |
| BCU00.6.00.6.050 FR0.3 Z2 002 HA B | 5164247 | ● | 0,60 | 4,00 | 50,00 | 0,60 | 2,00 | 0,30 | 2 | HA |
| BCU00.6.00.6.050 FR0.3 Z2 003 HA B | 5164120 | ● | 0,60 | 4,00 | 50,00 | 0,60 | 3,00 | 0,30 | 2 | HA |
| BCU00.6.00.6.050 FR0.3 Z2 004 HA B | 5164248 | ● | 0,60 | 4,00 | 50,00 | 0,60 | 4,00 | 0,30 | 2 | HA |
| BCU00.6.00.6.050 FR0.3 Z2 005 HA B | 5164249 | ● | 0,60 | 4,00 | 50,00 | 0,60 | 5,00 | 0,30 | 2 | HA |
| BCU00.8.00.8.050 FR0.4 Z2 003 HA B | 5164121 | ● | 0,80 | 4,00 | 50,00 | 0,80 | 3,00 | 0,40 | 2 | HA |
| BCU00.8.00.8.050 FR0.4 Z2 004 HA B | 5164255 | ● | 0,80 | 4,00 | 50,00 | 0,80 | 4,00 | 0,40 | 2 | HA |

Bestellbeispiel Order example: 1 Stück piece 5164235 oder or BCU00.4.00.4.050 FR0.2 Z2 00.7 HA B
Genauere Schnittwertempfehlung siehe Seite 295
Detailed cutting recommendations, see page 295

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

BALLtec SC Universal

Kugelfräser mit Hals „Form B“ Z2

Ballnose cutter neck „Form B“ Z2

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | z | Schaft Shank |
|------------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|-------|----------------|----------------|------|---|-----------------|
| | | | D _G | d _A | h | l ₁ | l ₂ | r | | |
| BCU00.8.00.8.050 FR0.4 Z2 006 HA B | 5164264 | ○ | 0,80 | 4,00 | 50,00 | 0,80 | 6,00 | 0,40 | 2 | HA |
| BCU001.001.050 FR0.5 Z2 003 HA B | 5164122 | ● | 1,00 | 4,00 | 50,00 | 1,00 | 3,00 | 0,50 | 2 | HA |
| BCU001.001.050 FR0.5 Z2 004 HA B | 5164265 | ○ | 1,00 | 4,00 | 50,00 | 1,00 | 4,00 | 0,50 | 2 | HA |
| BCU001.001.050 FR0.5 Z2 005 HA B | 5164123 | ● | 1,00 | 4,00 | 50,00 | 1,00 | 5,00 | 0,50 | 2 | HA |
| BCU001.001.050 FR0.5 Z2 006 HA B | 5164267 | ○ | 1,00 | 4,00 | 50,00 | 1,00 | 6,00 | 0,50 | 2 | HA |
| BCU001.001.050 FR0.5 Z2 008 HA B | 5164290 | ○ | 1,00 | 4,00 | 50,00 | 1,00 | 8,00 | 0,50 | 2 | HA |
| BCU001.001.050 FR0.5 Z2 010 HA B | 5164292 | ○ | 1,00 | 4,00 | 50,00 | 1,00 | 10,00 | 0,50 | 2 | HA |
| BCU01.5.01.5.050 FR0.8 Z2 005 HA B | 5164293 | ○ | 1,50 | 4,00 | 50,00 | 1,50 | 5,00 | 0,75 | 2 | HA |
| BCU01.5.01.5.050 FR0.8 Z2 006 HA B | 5164294 | ○ | 1,50 | 4,00 | 50,00 | 1,50 | 6,00 | 0,75 | 2 | HA |
| BCU01.5.01.5.050 FR0.8 Z2 008 HA B | 5164295 | ○ | 1,50 | 4,00 | 50,00 | 1,50 | 8,00 | 0,75 | 2 | HA |
| BCU01.5.01.5.050 FR0.8 Z2 010 HA B | 5164296 | ○ | 1,50 | 4,00 | 50,00 | 1,50 | 10,00 | 0,75 | 2 | HA |
| BCU01.5.01.5.050 FR0.8 Z2 012 HA B | 5164297 | ○ | 1,50 | 4,00 | 50,00 | 1,50 | 12,00 | 0,75 | 2 | HA |
| BCU01.5.01.5.050 FR0.8 Z2 015 HA B | 5164298 | ○ | 1,50 | 4,00 | 50,00 | 1,50 | 15,00 | 0,75 | 2 | HA |
| BCU002.002.050 FR1.0 Z2 006 HA B | 5164124 | ● | 2,00 | 4,00 | 50,00 | 2,00 | 6,00 | 1,00 | 2 | HA |
| BCU002.002.050 FR1.0 Z2 008 HA B | 5164299 | ○ | 2,00 | 4,00 | 50,00 | 2,00 | 8,00 | 1,00 | 2 | HA |
| BCU002.002.050 FR1.0 Z2 010 HA B | 5164300 | ○ | 2,00 | 4,00 | 50,00 | 2,00 | 10,00 | 1,00 | 2 | HA |
| BCU002.002.050 FR1.0 Z2 012 HA B | 5164301 | ○ | 2,00 | 4,00 | 50,00 | 2,00 | 12,00 | 1,00 | 2 | HA |
| BCU002.002.050 FR1.0 Z2 015 HA B | 5164302 | ○ | 2,00 | 4,00 | 50,00 | 2,00 | 15,00 | 1,00 | 2 | HA |
| BCU002.002.050 FR1.0 Z2 018 HA B | 5164303 | ○ | 2,00 | 4,00 | 50,00 | 2,00 | 18,00 | 1,00 | 2 | HA |
| BCU002.002.050 FR1.0 Z2 020 HA B | 5164304 | ○ | 2,00 | 4,00 | 50,00 | 2,00 | 20,00 | 1,00 | 2 | HA |
| BCU02.5.02.5.075 FR1.3 Z2 025 HA B | 5164308 | ○ | 2,50 | 4,00 | 75,00 | 2,50 | 25,00 | 1,25 | 2 | HA |
| BCU003.003.063 FR1.5 Z2 010 HA B | 5164126 | ● | 3,00 | 6,00 | 60,00 | 3,00 | 10,00 | 1,50 | 2 | HA |
| BCU003.003.060 FR1.5 Z2 015 HA B | 5164309 | ○ | 3,00 | 6,00 | 60,00 | 3,00 | 15,00 | 1,50 | 2 | HA |
| BCU003.003.060 FR1.5 Z2 020 HA B | 5164310 | ○ | 3,00 | 6,00 | 60,00 | 3,00 | 20,00 | 1,50 | 2 | HA |
| BCU003.003.075 FR1.5 Z2 025 HA B | 5164311 | ○ | 3,00 | 6,00 | 75,00 | 3,00 | 25,00 | 1,50 | 2 | HA |
| BCU004.004.060 FR2.0 Z2 010 HA B | 5164312 | ○ | 4,00 | 6,00 | 60,00 | 4,00 | 10,00 | 2,00 | 2 | HA |
| BCU004.004.060 FR2.0 Z2 015 HA B | 5164127 | ● | 4,00 | 6,00 | 60,00 | 4,00 | 15,00 | 2,00 | 2 | HA |
| BCU004.004.060 FR2.0 Z2 020 HA B | 5164313 | ○ | 4,00 | 6,00 | 60,00 | 4,00 | 20,00 | 2,00 | 2 | HA |
| BCU004.004.075 FR2.0 Z2 025 HA B | 5164314 | ○ | 4,00 | 6,00 | 75,00 | 4,00 | 25,00 | 2,00 | 2 | HA |
| BCU004.004.075 FR2.0 Z2 030 HA B | 5164315 | ○ | 4,00 | 6,00 | 75,00 | 4,00 | 30,00 | 2,00 | 2 | HA |
| BCU004.004.075 FR2.0 Z2 035 HA B | 5164316 | ○ | 4,00 | 6,00 | 75,00 | 4,00 | 35,00 | 2,00 | 2 | HA |
| BCU005.005.060 FR2.5 Z2 015 HA B | 5164317 | ○ | 5,00 | 6,00 | 60,00 | 5,00 | 15,00 | 2,50 | 2 | HA |
| BCU005.005.060 FR2.5 Z2 020 HA B | 5164318 | ○ | 5,00 | 6,00 | 60,00 | 5,00 | 20,00 | 2,50 | 2 | HA |
| BCU006.006.060 FR3.0 Z2 015 HA B | 5164128 | ● | 6,00 | 6,00 | 60,00 | 6,00 | 15,00 | 3,00 | 2 | HA |
| BCU006.006.060 FR3.0 Z2 020 HA B | 5164319 | ○ | 6,00 | 6,00 | 60,00 | 6,00 | 20,00 | 3,00 | 2 | HA |
| BCU006.006.060 FR3.0 Z2 025 HA B | 5164320 | ○ | 6,00 | 6,00 | 60,00 | 6,00 | 25,00 | 3,00 | 2 | HA |
| BCU006.006.075 FR3.0 Z2 030 HA B | 5164322 | ○ | 6,00 | 6,00 | 75,00 | 6,00 | 30,00 | 3,00 | 2 | HA |
| BCU006.006.075 FR3.0 Z2 035 HA B | 5164323 | ○ | 6,00 | 6,00 | 75,00 | 6,00 | 35,00 | 3,00 | 2 | HA |

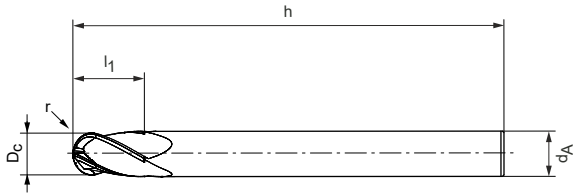
Bestellbeispiel Order example: 1 Stück piece 5164264 oder or BCU00.8.00.8.050 FR0.4 Z2 006 HA B
 Genaue Schnittwertempfehlung siehe Seite 295
 Detailed cutting recommendations, see page 295

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

BALLtec SC Universal

Kugelfräser „Form B“ Z4

Ballnose „Form B“ Z4



| Hard Facts | |
|--------------------|--|
| Fräserdurchmesser: | 6,00 - 10,00 mm |
| Beschichtung: | AlTiN PVD |
| Schneidenzahl: | Z = 4 |
| Drallwinkel: | 30° |
| Radiusgenauigkeit: | R = ± 0,005 |
| Anwendung: | Geeignet zur Bearbeitung von Werkstoffen bis 55 HRC. |
| Diameter: | 6.00 - 10.00 mm |
| Coating: | AlTiN PVD |
| Amount/Teeth: | Z = 4 |
| Helix angle: | 30° |
| Tolerance: | R = ± 0.005 |
| Application: | Machining of materials up to 55 HRC. |

| BALLtec SC Universal | | |
|----------------------|-----|---|
| ISO | | |
| P | P.1 | ■ |
| | P.2 | ■ |
| | P.3 | ■ |
| | P.4 | ■ |
| | P.5 | ■ |
| M | M.1 | □ |
| | M.2 | □ |
| K | K.1 | □ |
| | K.2 | □ |
| | K.3 | □ |
| H | H.1 | ■ |
| | H.2 | □ |

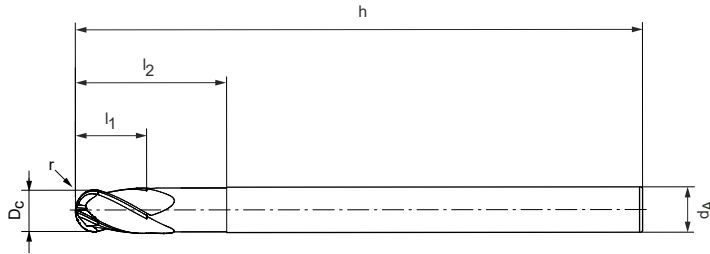
| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|-------|----------------|------|---|-----------------|
| | | | D _C | d _A | h | l ₁ | r | | |
| BCU006.006.060 FR3.0 Z4 HA B | 5164130 | ● | 6,00 | 6,00 | 60,00 | 6,00 | 3,00 | 4 | HA |
| BCU008.008.064 FR4.0 Z4 HA B | 5164131 | ● | 8,00 | 8,00 | 64,00 | 8,00 | 4,00 | 4 | HA |
| BCU010.010.075 FR5.0 Z4 HA B | 5164132 | ● | 10,00 | 10,00 | 75,00 | 10,00 | 5,00 | 4 | HA |

Bestellbeispiel Order example: 1 Stück piece 5164130 oder or BCU006.006.060 FR3.0 Z4 HA B
 Genaue Schnittwertempfehlung siehe Seite 295
 Detailed cutting recommendations, see page 295

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

BALLtec SC Universal

Kugelfräser mit Hals „Form B“ Z4
Ballnose cutter neck „Form B“ Z4



| Hard Facts | |
|--------------------|--|
| Fräserdurchmesser: | 3,00 - 6,00 mm |
| Beschichtung: | AlTiN PVD |
| Schneidenzahl: | Z = 4 |
| Drallwinkel: | 30° |
| Radiusgenauigkeit: | R = ± 0,005 |
| Anwendung: | Geeignet zur Bearbeitung von Werkstoffen bis 55 HRC. |
| Diameter: | 3.00 - 6.00 mm |
| Coating: | AlTiN PVD |
| Amount/Teeth: | Z = 4 |
| Helix angle: | 30° |
| Tolerance: | R = ± 0.005 |
| Application: | Machining of materials up to 55 HRC. |

| BALLtec SC Universal | | |
|----------------------|-----|---|
| ISO | | |
| P | P.1 | ■ |
| | P.2 | ■ |
| | P.3 | ■ |
| | P.4 | ■ |
| | P.5 | ■ |
| M | M.1 | □ |
| | M.2 | □ |
| K | K.1 | □ |
| | K.2 | □ |
| | K.3 | □ |
| H | H.1 | ■ |
| | H.2 | □ |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | z | Schaft Shank |
|----------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|-------|----------------|----------------|------|---|-----------------|
| | | | D _C | d _A | h | l ₁ | l ₂ | r | | |
| BCU003.003.060 FR1.5 Z4 010 HA B | 5164138 | ● | 3,00 | 6,00 | 60,00 | 3,00 | 10,00 | 1,50 | 4 | HA |
| BCU004.004.060 FR2.0 Z4 010 HA B | 5164139 | ● | 4,00 | 6,00 | 60,00 | 4,00 | 10,00 | 2,00 | 4 | HA |
| BCU005.005.060 FR2.5 Z4 015 HA B | 5164325 | ● | 5,00 | 6,00 | 60,00 | 5,00 | 15,00 | 2,50 | 4 | HA |
| BCU006.006.060 FR3.0 Z4 020 HA B | 5164326 | ● | 6,00 | 6,00 | 60,00 | 6,00 | 20,00 | 3,00 | 4 | HA |

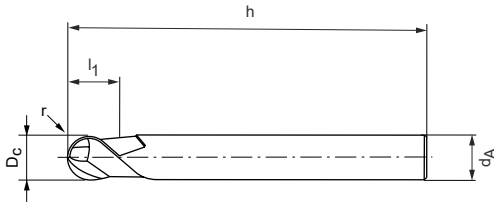
Bestellbeispiel Order example: 1 Stück piece 5164138 oder or BCU003.003.060 FR1.5 Z4 010 HA B
Genauere Schnittwertempfehlung siehe Seite 295
Detailed cutting recommendations, see page 295

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

BALLtec SC Hardened

Kugelfräser „Form B“ Z2

Ballnose cutter „Form B“ Z2



| Hard Facts | |
|--------------------|---|
| Fräserdurchmesser: | 6,00 - 10,00 mm |
| Beschichtung: | TiSiN PVD |
| Schneidenzahl: | Z = 2 |
| Drallwinkel: | 30° |
| Radiusgenauigkeit: | R = ±0,005 wenn d1 ≤ 6 mm R = ±0,01 wenn d1 > 6 mm |
| Anwendung: | Geeignet zur Bearbeitung von Werkstoffen bis 66 HRC. |
| Diameter: | 6.00 - 10.00 mm |
| Coating: | TiSiN PVD |
| Amount/Teeth: | Z = 2 |
| Helix angle: | 30° |
| Tolerance: | R = ±0.005 if d1 ≤ 6 mm R = ±0.01 if d1 > 6 mm |
| Application: | Machining of materials up to 66 HRC. |

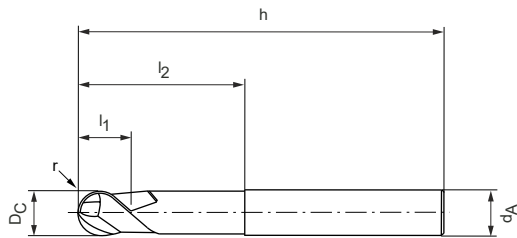
| BALLtec SC Hardened | | |
|---------------------|-----|---|
| ISO | | |
| P | P.1 | □ |
| | P.2 | □ |
| | P.3 | □ |
| | P.4 | □ |
| | P.5 | □ |
| K | K.1 | □ |
| | K.2 | □ |
| | K.3 | □ |
| H | H.1 | ■ |
| | H.2 | ■ |
| | H.3 | ■ |
| | H.4 | ■ |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|----|----------------|---|---|-----------------|
| | | | D _c | d _A | l | l ₁ | r | | |
| BCH006.06.9.060 FR3.0 Z2 HA B | 5169923 | ● | 6,00 | 6,00 | 60 | 6,9 | 3 | 2 | HA |
| BCH008.09.2.064 FR4.0 Z2 HA B | 5169924 | ● | 8,00 | 8,00 | 64 | 9,2 | 4 | 2 | HA |
| BCH010.011.075 FR5.0 Z2 HA B | 5169925 | ● | 10,00 | 10,00 | 75 | 11,5 | 5 | 2 | HA |

Bestellbeispiel Order example: 1 Stück piece 5169923 oder or BCH006.06.9.060 FR3.0 Z2 HA B
 Genaue Schnittwertempfehlung siehe Seite 296
 Detailed cutting recommendations, see page 296

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

BALLtec SC Hardened
Kugelfräser mit Hals „Form B“ Z2
Ballnose cutter neck „Form B“ Z2



| Hard Facts | |
|--------------------|---|
| Fräserdurchmesser: | 0,40 - 6,00 mm |
| Beschichtung: | TiSiN PVD |
| Schneidenzahl: | Z = 2 |
| Drallwinkel: | 30° |
| Radiusgenauigkeit: | R = ±0,005 wenn d1 ≤ 6 mm R = ±0,01 wenn d1 > 6 mm |
| Anwendung: | Geeignet zur Bearbeitung von Werkstoffen bis 66 HRC. |
| Diameter: | 0.40 - 6.00 mm |
| Coating: | TiSiN PVD |
| Amount/Teeth: | Z = 2 |
| Helix angle: | 30° |
| Tolerance: | R = ±0.005 if d1 ≤ 6 mm R = ±0.01 if d1 > 6 mm |
| Application: | Machining of materials up to 66 HRC. |

| BALLtec SC Hardened | | |
|---------------------|-----|---|
| ISO | | |
| P | P.1 | ☐ |
| | P.2 | ☐ |
| | P.3 | ☐ |
| | P.4 | ☐ |
| | P.5 | ☐ |
| K | K.1 | ☐ |
| | K.2 | ☐ |
| | K.3 | ☐ |
| H | H.1 | ■ |
| | H.2 | ■ |
| | H.3 | ■ |
| | H.4 | ■ |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] | | | Dimensions [mm] | | | z | Schaft Shank |
|--------------------------------------|-----------------------------|-------------------------------|------------------|----------------|----|-----------------|----------------|------|---|-----------------|
| | | | D _C | d _A | h | l ₁ | l ₂ | r | | |
| BCH00.4.00.5.050 FR0.2 Z2 00.7 HA B | 5170025 | ○ | 0,40 | 4,00 | 50 | 0,5 | 0,75 | 0,2 | 2 | HA |
| BCH00.4.00.5.050 FR0.2 Z2 001 HA B | 5170026 | ○ | 0,40 | 4,00 | 50 | 0,5 | 1 | 0,2 | 2 | HA |
| BCH00.4.00.5.050 FR0.2 Z2 01.5 HA B | 5170027 | ○ | 0,40 | 4,00 | 50 | 0,5 | 1,5 | 0,2 | 2 | HA |
| BCH00.4.00.5.050 FR0.2 Z2 002 HA B | 5170028 | ○ | 0,40 | 4,00 | 50 | 0,5 | 2 | 0,2 | 2 | HA |
| BCH00.5.00.6.050 FR0.25 Z2 01.5 HA B | 5170030 | ● | 0,50 | 4,00 | 50 | 0,6 | 1,5 | 0,25 | 2 | HA |
| BCH00.5.00.6.050 FR0.25 Z2 002 HA B | 5170031 | ● | 0,50 | 4,00 | 50 | 0,6 | 2 | 0,25 | 2 | HA |
| BCH00.5.00.6.050 FR0.25 Z2 003 HA B | 5170032 | ● | 0,50 | 4,00 | 50 | 0,6 | 3 | 0,25 | 2 | HA |
| BCH00.5.00.6.050 FR0.25 Z2 004 HA B | 5170033 | ● | 0,50 | 4,00 | 50 | 0,6 | 4 | 0,25 | 2 | HA |
| BCH00.6.00.7.050 FR0.3 Z2 002 HA B | 5170041 | ● | 0,60 | 4,00 | 50 | 0,7 | 2 | 0,3 | 2 | HA |
| BCH00.6.00.7.050 FR0.3 Z2 003 HA B | 5170042 | ● | 0,60 | 4,00 | 50 | 0,7 | 3 | 0,3 | 2 | HA |
| BCH00.6.00.7.050 FR0.3 Z2 004 HA B | 5170043 | ● | 0,60 | 4,00 | 50 | 0,7 | 4 | 0,3 | 2 | HA |
| BCH00.6.00.7.050 FR0.3 Z2 005 HA B | 5170045 | ● | 0,60 | 4,00 | 50 | 0,7 | 5 | 0,3 | 2 | HA |
| BCH00.8.00.9.050 FR0.4 Z2 003 HA B | 5170048 | ● | 0,80 | 4,00 | 50 | 0,9 | 3 | 0,4 | 2 | HA |
| BCH00.8.00.9.050 FR0.4 Z2 004 HA B | 5170049 | ● | 0,80 | 4,00 | 50 | 0,9 | 4 | 0,4 | 2 | HA |
| BCH00.8.00.9.050 FR0.4 Z2 006 HA B | 5170050 | ● | 0,80 | 4,00 | 50 | 0,9 | 6 | 0,4 | 2 | HA |

Bestellbeispiel Order example: 1 Stück piece 5170025 oder or BCH00.4.00.5.050 FR0.2 Z2 00.7 HA B
Genauere Schnittwertempfehlung siehe Seite 296
Detailed cutting recommendations, see page 296

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

BALLtec SC Hardened

Kugelfräser mit Hals „Form B“ Z2

Ballnose cutter neck „Form B“ Z2

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | z | Schaft Shank |
|-------------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|----|----------------|----------------|------|---|-----------------|
| | | | D _C | d _A | h | l ₁ | l ₂ | r | | |
| BCH001.01.2.050 FR0.5 Z2 003 HA B | 5170051 | ● | 1,00 | 4,00 | 50 | 1,2 | 3 | 0,5 | 2 | HA |
| BCH001.01.2.050 FR0.5 Z2 004 HA B | 5170057 | ● | 1,00 | 4,00 | 50 | 1,2 | 4 | 0,5 | 2 | HA |
| BCH001.01.2.050 FR0.5 Z2 005 HA B | 5170058 | ● | 1,00 | 4,00 | 50 | 1,2 | 5 | 0,5 | 2 | HA |
| BCH001.01.2.050 FR0.5 Z2 006 HA B | 5170059 | ● | 1,00 | 4,00 | 50 | 1,2 | 6 | 0,50 | 2 | HA |
| BCH001.01.2.050 FR0.5 Z2 008 HA B | 5170061 | ● | 1,00 | 4,00 | 50 | 1,2 | 8 | 0,50 | 2 | HA |
| BCH001.01.2.050 FR0.5 Z2 010 HA B | 5170069 | ● | 1,00 | 4,00 | 50 | 1,2 | 10 | 0,50 | 2 | HA |
| BCH01.5.01.7.050 FR0.75 Z2 005 HA B | 5170070 | ● | 1,50 | 4,00 | 50 | 1,7 | 5 | 0,75 | 2 | HA |
| BCH01.5.01.7.050 FR0.75 Z2 006 HA B | 5170071 | ● | 1,50 | 4,00 | 50 | 1,7 | 6 | 0,75 | 2 | HA |
| BCH01.5.01.7.050 FR0.75 Z2 008 HA B | 5170072 | ● | 1,50 | 4,00 | 50 | 1,7 | 8 | 0,75 | 2 | HA |
| BCH01.5.01.7.050 FR0.75 Z2 010 HA B | 5170073 | ● | 1,50 | 4,00 | 50 | 1,7 | 10 | 0,75 | 2 | HA |
| BCH01.5.01.7.050 FR0.75 Z2 012 HA B | 5170074 | ● | 1,50 | 4,00 | 50 | 1,7 | 12 | 0,75 | 2 | HA |
| BCH01.5.01.7.050 FR0.75 Z2 015 HA B | 5170075 | ● | 1,50 | 4,00 | 50 | 1,7 | 15 | 0,75 | 2 | HA |
| BCH002.02.3.050 FR1.0 Z2 006 HA B | 5170076 | ● | 2,00 | 4,00 | 50 | 2,3 | 6 | 1,00 | 2 | HA |
| BCH002.02.3.050 FR1.0 Z2 008 HA B | 5170077 | ● | 2,00 | 4,00 | 50 | 2,3 | 8 | 1,00 | 2 | HA |
| BCH002.02.3.050 FR1.0 Z2 010 HA B | 5170078 | ● | 2,00 | 4,00 | 50 | 2,3 | 10 | 1,00 | 2 | HA |
| BCH002.02.3.050 FR1.0 Z2 012 HA B | 5170079 | ● | 2,00 | 4,00 | 50 | 2,3 | 12 | 1,00 | 2 | HA |
| BCH002.02.3.050 FR1.0 Z2 015 HA B | 5170080 | ● | 2,00 | 4,00 | 50 | 2,3 | 15 | 1,00 | 2 | HA |
| BCH002.02.3.050 FR1.0 Z2 018 HA B | 5170093 | ● | 2,00 | 4,00 | 50 | 2,3 | 18 | 1,00 | 2 | HA |
| BCH002.02.3.050 FR1.0 Z2 020 HA B | 5170094 | ● | 2,00 | 4,00 | 50 | 2,3 | 20 | 1,00 | 2 | HA |
| BCH02.5.02.9.075 FR1.25 Z2 025 HA B | 5170095 | ● | 2,50 | 6,00 | 75 | 2,9 | 25 | 1,25 | 2 | HA |
| BCH003.03.5.060 FR1.5 Z2 010 HA B | 5170096 | ● | 3,00 | 6,00 | 60 | 3,5 | 10 | 1,50 | 2 | HA |
| BCH003.03.5.060 FR1.5 Z2 015 HA B | 5170097 | ● | 3,00 | 6,00 | 60 | 3,5 | 15 | 1,50 | 2 | HA |
| BCH003.03.5.060 FR1.5 Z2 020 HA B | 5170098 | ● | 3,00 | 6,00 | 60 | 3,5 | 20 | 1,50 | 2 | HA |
| BCH003.03.5.075 FR1.5 Z2 025 HA B | 5170099 | ● | 3,00 | 6,00 | 75 | 3,5 | 25 | 1,50 | 2 | HA |
| BCH004.04.6.060 FR2.0 Z2 010 HA B | 5170100 | ● | 4,00 | 6,00 | 60 | 4,6 | 10 | 2,00 | 2 | HA |
| BCH004.04.6.060 FR2.0 Z2 015 HA B | 5170101 | ● | 4,00 | 6,00 | 60 | 4,6 | 15 | 2,00 | 2 | HA |
| BCH004.04.6.060 FR2.0 Z2 020 HA B | 5170102 | ● | 4,00 | 6,00 | 60 | 4,6 | 20 | 2,00 | 2 | HA |
| BCH004.04.6.075 FR2.0 Z2 025 HA B | 5170103 | ● | 4,00 | 6,00 | 75 | 4,6 | 25 | 2,00 | 2 | HA |
| BCH004.04.6.075 FR2.0 Z2 030 HA B | 5170104 | ● | 4,00 | 6,00 | 75 | 4,6 | 30 | 2,00 | 2 | HA |
| BCH004.04.6.075 FR2.0 Z2 035 HA B | 5170105 | ● | 4,00 | 6,00 | 75 | 4,6 | 35 | 2,00 | 2 | HA |
| BCH005.05.8.060 FR2.5 Z2 015 HA B | 5170106 | ● | 5,00 | 6,00 | 60 | 5,8 | 15 | 2,50 | 2 | HA |
| BCH005.05.8.060 FR2.5 Z2 020 HA B | 5170107 | ● | 5,00 | 6,00 | 60 | 5,8 | 20 | 2,50 | 2 | HA |
| BCH006.06.9.060 FR3.0 Z2 015 HA B | 5170108 | ● | 6,00 | 6,00 | 60 | 6,9 | 15 | 3,00 | 2 | HA |
| BCH006.06.9.060 FR3.0 Z2 020 HA B | 5170128 | ● | 6,00 | 6,00 | 60 | 6,9 | 20 | 3,00 | 2 | HA |
| BCH006.06.9.060 FR3.0 Z2 025 HA B | 5170129 | ● | 6,00 | 6,00 | 60 | 6,9 | 25 | 3,00 | 2 | HA |
| BCH006.06.9.075 FR3.0 Z2 030 HA B | 5170130 | ● | 6,00 | 6,00 | 75 | 6,9 | 30 | 3,00 | 2 | HA |
| BCH006.06.9.075 FR3.0 Z2 035 HA B | 5170131 | ● | 6,00 | 6,00 | 75 | 6,9 | 35 | 3,00 | 2 | HA |

Bestellbeispiel Order example: 1 Stück piece 5170051 oder or BCH001.01.2.050 FR0.5 Z2 003 HA B

Genauere Schnittwertempfehlung siehe Seite 296

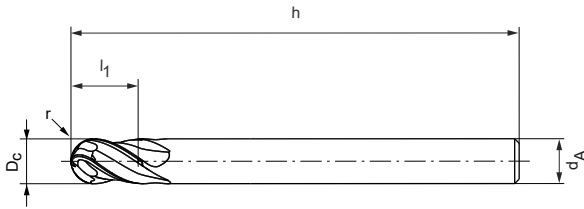
Detailed cutting recommendations, see page 296

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

BALLtec SC Hardened

Kugelfräser „Form B“ Z4

Ballnose „Form B“ Z4



| Hard Facts | |
|--------------------|---|
| Fräserdurchmesser: | 6,00 - 10,00 mm |
| Beschichtung: | TiSiN PVD |
| Schneidenzahl: | Z = 4 |
| Drallwinkel: | 35° |
| Radiusgenauigkeit: | R = ±0,005 wenn d1 ≤ 6 mm R = ±0,01 wenn d1 > 6 mm |
| Anwendung: | Geeignet zur Bearbeitung von Werkstoffen bis 66 HRC. |
| Diameter: | 6.00 - 10.00 mm |
| Coating: | TiSiN PVD |
| Amount/Teeth: | Z = 4 |
| Helix angle: | 35° |
| Tolerance: | R = ±0.005 if d1 ≤ 6 mm R = ±0.01 if d1 > 6 mm |
| Application: | Machining of materials up to 66 HRC. |

| BALLtec SC Hardened | | |
|---------------------|-----|-------------------------------------|
| ISO | | |
| P | P.1 | <input type="checkbox"/> |
| | P.2 | <input type="checkbox"/> |
| | P.3 | <input type="checkbox"/> |
| | P.4 | <input type="checkbox"/> |
| | P.5 | <input type="checkbox"/> |
| K | K.1 | <input type="checkbox"/> |
| | K.2 | <input type="checkbox"/> |
| | K.3 | <input type="checkbox"/> |
| H | H.1 | <input checked="" type="checkbox"/> |
| | H.2 | <input checked="" type="checkbox"/> |
| | H.3 | <input checked="" type="checkbox"/> |
| | H.4 | <input checked="" type="checkbox"/> |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|----|----------------|---|---|-----------------|
| | | | D _C | d _A | h | l ₁ | r | | |
| BCH006.06.9.060 FR3.0 Z4 HA B | 5169930 | ● | 6,00 | 6,00 | 60 | 6,9 | 3 | 4 | HA |
| BCH008.09.2.064 FR4.0 Z4 HA B | 5169931 | ● | 8,00 | 8,00 | 64 | 9,2 | 4 | 4 | HA |
| BCH010.011.075 FR5.0 Z4 HA B | 5169933 | ● | 10,00 | 10,00 | 75 | 11,5 | 5 | 4 | HA |

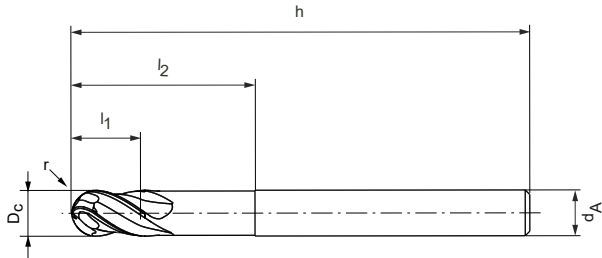
Bestellbeispiel Order example: 1 Stück piece 5169930 oder or BCH006.06.9.060 FR3.0 Z4 HA B
 Genaue Schnittwertempfehlung siehe Seite 296
 Detailed cutting recommendations, see page 296

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

BALLtec SC Hardened

Kugelfräser mit Hals „Form B“ Z4

Ballnose cutter neck „Form B“ Z4



| Hard Facts | |
|--------------------|---|
| Fräserdurchmesser: | 3,00 - 6,00 mm |
| Beschichtung: | TiSiN PVD |
| Schneidenzahl: | Z = 4 |
| Drallwinkel: | 35° |
| Radiusgenauigkeit: | R = ±0,005 wenn d1 ≤ 6 mm R = ±0,01 wenn d1 > 6 mm |
| Anwendung: | Geeignet zur Bearbeitung von Werkstoffen bis 66 HRC. |
| Diameter: | 3.00 - 6.00 mm |
| Coating: | TiSiN PVD |
| Amount/Teeth: | Z = 4 |
| Helix angle: | 35° |
| Tolerance: | R = ±0.005 if d1 ≤ 6 mm R = ±0.01 if d1 > 6 mm |
| Application: | Machining of materials up to 66 HRC. |

| BALLtec SC Hardened | | |
|---------------------|-----|-------------------------------------|
| ISO | | |
| P | P.1 | <input type="checkbox"/> |
| | P.2 | <input type="checkbox"/> |
| | P.3 | <input type="checkbox"/> |
| | P.4 | <input type="checkbox"/> |
| | P.5 | <input type="checkbox"/> |
| K | K.1 | <input type="checkbox"/> |
| | K.2 | <input type="checkbox"/> |
| | K.3 | <input type="checkbox"/> |
| H | H.1 | <input checked="" type="checkbox"/> |
| | H.2 | <input checked="" type="checkbox"/> |
| | H.3 | <input checked="" type="checkbox"/> |
| | H.4 | <input checked="" type="checkbox"/> |

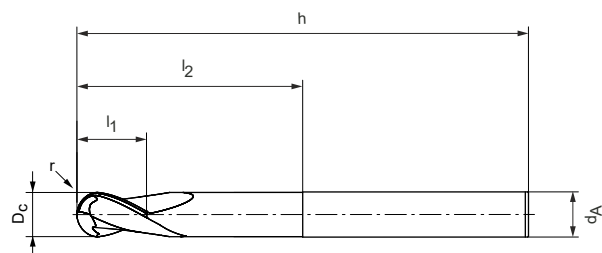
| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | z | Schaft Shank |
|-----------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|----|----------------|----------------|-----|---|-----------------|
| | | | D _c | d _A | h | l ₁ | l ₂ | r | | |
| BCH003.03.5.060 FR1.5 Z4 010 HA B | 5169934 | ● | 3,00 | 6,00 | 60 | 3,5 | 10 | 1,5 | 4 | HA |
| BCH004.04.6.060 FR2.0 Z4 010 HA B | 5169935 | ● | 4,00 | 6,00 | 60 | 4,6 | 10 | 2 | 4 | HA |
| BCH005.05.8.060 FR2.5 Z4 015 HA B | 5169936 | ○ | 5,00 | 6,00 | 60 | 5,8 | 15 | 2,5 | 4 | HA |
| BCH006.06.9.060 FR3.0 Z4 020 HA B | 5169937 | ● | 6,00 | 6,00 | 60 | 6,9 | 20 | 3 | 4 | HA |

Bestellbeispiel Order example: 1 Stück piece 5169934 oder or BCH003.03.5.060 FR1.5 Z4 010 HA B
 Genaue Schnittwertempfehlung siehe Seite 296
 Detailed cutting recommendations, see page 296

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

BALLtec SC N

Kugelfräser mit Hals „Form B“ Z2
Ballnose cutter neck „Form B“ Z2



| Hard Facts | |
|--------------------|-----------------|
| Fräserdurchmesser: | 1,00 - 20,00 mm |
| Beschichtung: | TiBX2r PVD |
| Schneidenzahl: | Z = 2 |
| Drallwinkel: | 30° |
| Radiusgenauigkeit: | R = ± 0,005 |
| | |
| Diameter: | 1.00 - 20.00 mm |
| Coating: | TiBX2r PVD |
| Amount/Teeth: | Z = 2 |
| Helix angle: | 30° |
| Tolerance: | R = ± 0.005 |

| BALLtec SC N | | |
|--------------|-----|---|
| ISO | | |
| M | M.1 | □ |
| | M.2 | □ |
| N | N.1 | ■ |
| | N.2 | ■ |
| | N.3 | □ |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | z | Schaft Shank |
|------------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|--------|----------------|----------------|-------|---|-----------------|
| | | | D _C | d _A | h | l ₁ | l ₂ | r | | |
| BCN001.01.5.075 FR0.5 Z2 020 HA B | 5164140 | ● | 1,00 | 4,00 | 75,00 | 1,50 | 20,00 | 0,50 | 2 | HA |
| BCN01.5.02.5.075 FR0.8 Z2 020 HA B | 5164143 | ● | 1,50 | 4,00 | 75,00 | 2,50 | 20,00 | 0,75 | 2 | HA |
| BCN002.003.075 FR1.0 Z2 020 HA B | 5164145 | ● | 2,00 | 4,00 | 75,00 | 3,00 | 20,00 | 1,00 | 2 | HA |
| BCN003.04.5.057 FR1.5 Z2 020 HA B | 5164146 | ● | 3,00 | 6,00 | 57,00 | 4,50 | 20,00 | 1,50 | 2 | HA |
| BCN004.006.057 FR2.0 Z2 020 HA B | 5164148 | ● | 4,00 | 6,00 | 57,00 | 6,00 | 20,00 | 2,00 | 2 | HA |
| BCN006.009.057 FR3.0 Z2 020 HA B | 5164149 | ● | 6,00 | 6,00 | 57,00 | 9,00 | 20,00 | 3,00 | 2 | HA |
| BCN008.012.090 FR4.0 Z2 035 HA B | 5164150 | ● | 8,00 | 8,00 | 90,00 | 12,00 | 35,00 | 4,00 | 2 | HA |
| BCN010.015.100 FR5.0 Z2 050 HA B | 5164337 | ⦿ | 10,00 | 10,00 | 100,00 | 15,00 | 50,00 | 5,00 | 2 | HA |
| BCN012.018.110 FR6.0 Z2 050 HA B | 5164339 | ⦿ | 12,00 | 12,00 | 110,00 | 18,00 | 50,00 | 6,00 | 2 | HA |
| BCN016.024.150 FR8.0 Z2 100 HA B | 5164341 | ⦿ | 16,00 | 16,00 | 150,00 | 24,00 | 100,00 | 8,00 | 2 | HA |
| BCN020.030.150 FR10.0 Z2 100 HA B | 5164345 | ⦿ | 20,00 | 20,00 | 150,00 | 30,00 | 100,00 | 10,00 | 2 | HA |

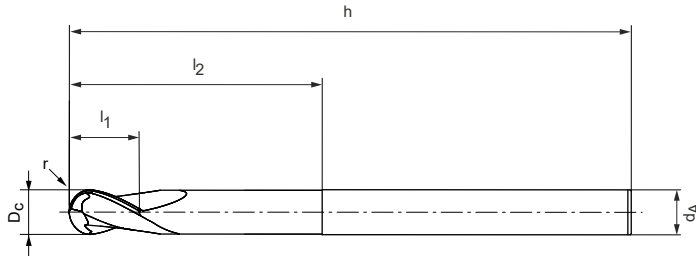
Bestellbeispiel Order example: 1 Stück piece 5164140 oder or BCN001.01.5.075 FR0.5 Z2 020 HA B
Genauere Schnittwertempfehlung siehe Seite 297
Detailed cutting recommendations, see page 297

- Verfügbar ab Lager Available from stock
- ⦿ Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

BALLtec SC Graphite

Kugelfräser mit Hals „Form B“ Z2

Ballnose cutter neck „Form B“ Z2



| Hard Facts | |
|--------------------|---|
| Fräserdurchmesser: | 0,40 - 10,00 mm |
| Beschichtung: | Diamantbeschichtung |
| Schneidenzahl: | Z = 2 |
| Drallwinkel: | 35° |
| Radiusgenauigkeit: | R = ±0,005 wenn d1 ≤ 2 mm R = +0,01 / -0,015 wenn d1 > 2 mm |
| Anwendung: | Geeignet zur Bearbeitung von Graphitelektroden. Durch eingeeengte Radiustoleranz vorwiegend zum Schlichten und Vorschlichten eingesetzt. |
| Diameter: | 0.40 - 10.00 mm |
| Coating: | Diamond coating |
| Amount/Teeth: | Z = 2 |
| Helix angle: | 35° |
| Tolerance: | R = ±0.005 if d1 ≤ 2 mm R = +0.01 / -0.015 if d1 > 2 mm |
| Application: | Suitable for machining graphite electrodes. Mainly used for finishing and pre-finishing due to narrowed radius tolerance. |

| BALLtec SC Graphite | | |
|---------------------|-----|---|
| ISO | | |
| N | N.4 | ■ |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | | z | Schaft Shank |
|--------------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|----|----------------|----------------|------|---|----|-----------------|
| | | | D _c | d _A | h | l ₁ | l ₂ | r | | | |
| BCG00.4.00.6.050 FR0.2 Z2 01.2 HA B | 5170143 | ● | 0,40 | 4,00 | 50 | 0,6 | 1,2 | 0,2 | 2 | HA | |
| BCG00.4.00.6.050 FR0.2 Z2 02.5 HA B | 5170144 | ● | 0,40 | 4,00 | 50 | 0,6 | 2,5 | 0,2 | 2 | HA | |
| BCG00.4.00.6.050 FR0.2 Z2 005 HA B | 5170145 | ● | 0,40 | 4,00 | 50 | 0,6 | 5 | 0,2 | 2 | HA | |
| BCG00.5.00.8.050 FR0.25 Z2 01.5 HA B | 5170146 | ● | 0,50 | 4,00 | 50 | 0,8 | 1,5 | 0,25 | 2 | HA | |
| BCG00.5.00.8.050 FR0.25 Z2 03.5 HA B | 5170147 | ● | 0,50 | 4,00 | 50 | 0,8 | 3,5 | 0,25 | 2 | HA | |
| BCG00.5.00.8.050 FR0.25 Z2 005 HA B | 5170148 | ● | 0,50 | 4,00 | 50 | 0,8 | 5 | 0,25 | 2 | HA | |
| BCG00.5.00.8.050 FR0.25 Z2 007 HA B | 5170149 | ● | 0,50 | 4,00 | 50 | 0,8 | 7 | 0,25 | 2 | HA | |
| BCG00.5.00.8.050 FR0.25 Z2 010 HA B | 5170150 | ● | 0,50 | 4,00 | 50 | 0,8 | 10 | 0,25 | 2 | HA | |
| BCG00.6.00.9.050 FR0.3 Z2 01.2 HA B | 5170151 | ● | 0,60 | 4,00 | 50 | 0,9 | 1,2 | 0,3 | 2 | HA | |
| BCG00.6.00.9.050 FR0.3 Z2 03.5 HA B | 5170152 | ● | 0,60 | 4,00 | 50 | 0,9 | 3,5 | 0,3 | 2 | HA | |
| BCG00.6.00.9.050 FR0.3 Z2 005 HA B | 5170153 | ● | 0,60 | 4,00 | 50 | 0,9 | 5 | 0,3 | 2 | HA | |
| BCG00.6.00.9.050 FR0.3 Z2 007 HA B | 5170154 | ● | 0,60 | 4,00 | 50 | 0,9 | 7 | 0,3 | 2 | HA | |
| BCG00.6.00.9.050 FR0.3 Z2 010 HA B | 5170155 | ● | 0,60 | 4,00 | 50 | 0,9 | 10 | 0,3 | 2 | HA | |
| BCG00.6.00.9.050 FR0.3 Z2 012 HA B | 5170156 | ● | 0,60 | 4,00 | 50 | 0,9 | 12 | 0,3 | 2 | HA | |

Bestellbeispiel Order example: 1 Stück piece 5170143 oder or BCG00.4.00.6.050 FR0.2 Z2 01.2 HA B

Genauere Schnittwertempfehlung siehe Seite 298

Detailed cutting recommendations, see page 298

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

BALLtec SC Graphite

Kugelfräser mit Hals „Form B“ Z2

Ballnose cutter neck „Form B“ Z2

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | z | Schaft Shank |
|-------------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|-----|----------------|----------------|------|---|-----------------|
| | | | D _G | d _A | h | l ₁ | l ₂ | r | | |
| BCG00.8.01.2.050 FR0.4 Z2 005 HA B | 5170157 | ● | 0,80 | 4,00 | 50 | 1,2 | 5 | 0,4 | 2 | HA |
| BCG00.8.01.2.050 FR0.4 Z2 010 HA B | 5170158 | ● | 0,80 | 4,00 | 50 | 1,2 | 10 | 0,4 | 2 | HA |
| BCG00.8.01.2.050 FR0.4 Z2 012 HA B | 5170159 | ● | 0,80 | 4,00 | 50 | 1,2 | 12 | 0,4 | 2 | HA |
| BCG00.8.01.2.050 FR0.4 Z2 016 HA B | 5170160 | ● | 0,80 | 4,00 | 50 | 1,2 | 16 | 0,4 | 2 | HA |
| BCG001.01.5.050 FR0.5 Z2 005 HA B | 5170161 | ● | 1,00 | 4,00 | 50 | 1,5 | 5 | 0,5 | 2 | HA |
| BCG001.01.5.050 FR0.5 Z2 010 HA B | 5170162 | ● | 1,00 | 4,00 | 50 | 1,5 | 10 | 0,5 | 2 | HA |
| BCG001.01.5.050 FR0.5 Z2 015 HA B | 5170312 | ● | 1,00 | 4,00 | 50 | 1,5 | 15 | 0,5 | 2 | HA |
| BCG001.01.5.050 FR0.5 Z2 020 HA B | 5170313 | ● | 1,00 | 4,00 | 50 | 1,5 | 20 | 0,5 | 2 | HA |
| BCG01.5.02.3.050 FR0.75 Z2 010 HA B | 5170314 | ● | 1,50 | 4,00 | 50 | 2,3 | 10 | 0,75 | 2 | HA |
| BCG01.5.02.3.050 FR0.75 Z2 015 HA B | 5170315 | ● | 1,50 | 4,00 | 50 | 2,3 | 15 | 0,75 | 2 | HA |
| BCG01.5.02.3.050 FR0.75 Z2 020 HA B | 5170316 | ● | 1,50 | 4,00 | 50 | 2,3 | 20 | 0,75 | 2 | HA |
| BCG01.5.02.3.075 FR0.75 Z2 025 HA B | 5170317 | ● | 1,50 | 4,00 | 75 | 2,3 | 25 | 0,75 | 2 | HA |
| BCG002.004.050 FR1.0 Z2 010 HA B | 5170318 | ● | 2,00 | 4,00 | 50 | 4 | 10 | 1 | 2 | HA |
| BCG002.004.050 FR1.0 Z2 015 HA B | 5170319 | ● | 2,00 | 4,00 | 50 | 4 | 15 | 1 | 2 | HA |
| BCG002.004.075 FR1.0 Z2 020 HA B | 5170320 | ● | 2,00 | 4,00 | 75 | 4 | 20 | 1 | 2 | HA |
| BCG002.004.075 FR1.0 Z2 025 HA B | 5170321 | ● | 2,00 | 4,00 | 75 | 4 | 25 | 1 | 2 | HA |
| BCG003.04.5.050 FR1.5 Z2 005 HA B | 5170322 | ● | 3,00 | 4,00 | 50 | 4,5 | 5 | 1,5 | 2 | HA |
| BCG003.006.050 FR1.5 Z2 010 HA B | 5170323 | ● | 3,00 | 4,00 | 50 | 6 | 10 | 1,5 | 2 | HA |
| BCG003.006.050 FR1.5 Z2 015 HA B | 5170327 | ● | 3,00 | 4,00 | 50 | 6 | 15 | 1,5 | 2 | HA |
| BCG003.006.075 FR1.5 Z2 020 HA B | 5170328 | ● | 3,00 | 4,00 | 75 | 6 | 20 | 1,5 | 2 | HA |
| BCG003.006.075 FR1.5 Z2 025 HA B | 5170329 | ● | 3,00 | 4,00 | 75 | 6 | 25 | 1,5 | 2 | HA |
| BCG003.006.075 FR1.5 Z2 030 HA B | 5170330 | ● | 3,00 | 4,00 | 75 | 6 | 30 | 1,5 | 2 | HA |
| BCG004.008.050 FR2.0 Z2 015 HA B | 5170331 | ● | 4,00 | 4,00 | 50 | 8 | 15 | 2 | 2 | HA |
| BCG004.008.075 FR2.0 Z2 020 HA B | 5170332 | ● | 4,00 | 4,00 | 75 | 8 | 20 | 2 | 2 | HA |
| BCG004.008.075 FR2.0 Z2 025 HA B | 5170333 | ● | 4,00 | 4,00 | 75 | 8 | 25 | 2 | 2 | HA |
| BCG004.008.100 FR2.0 Z2 045 HA B | 5170334 | ● | 4,00 | 4,00 | 100 | 8 | 45 | 2 | 2 | HA |
| BCG005.010.057 FR2.5 Z2 025 HA B | 5170335 | ● | 5,00 | 6,00 | 57 | 10 | 25 | 2,5 | 2 | HA |
| BCG005.010.100 FR2.5 Z2 045 HA B | 5170336 | ● | 5,00 | 6,00 | 100 | 10 | 45 | 2,5 | 2 | HA |
| BCG006.012.075 FR3.0 Z2 020 HA B | 5170337 | ● | 6,00 | 6,00 | 75 | 12 | 20 | 3 | 2 | HA |
| BCG006.012.075 FR3.0 Z2 025 HA B | 5170338 | ● | 6,00 | 6,00 | 75 | 12 | 25 | 3 | 2 | HA |
| BCG006.012.075 FR3.0 Z2 030 HA B | 5170339 | ● | 6,00 | 6,00 | 75 | 12 | 30 | 3 | 2 | HA |
| BCG006.012.100 FR3.0 Z2 045 HA B | 5170340 | ● | 6,00 | 6,00 | 100 | 12 | 45 | 3 | 2 | HA |
| BCG006.012.100 FR3.0 Z2 060 HA B | 5170341 | ● | 6,00 | 6,00 | 100 | 12 | 60 | 3 | 2 | HA |
| BCG008.016.063 FR4.0 Z2 025 HA B | 5170342 | ● | 8,00 | 8,00 | 63 | 16 | 25 | 4 | 2 | HA |
| BCG008.016.100 FR4.0 Z2 045 HA B | 5170344 | ● | 8,00 | 8,00 | 100 | 16 | 45 | 4 | 2 | HA |
| BCG008.016.150 FR4.0 Z2 060 HA B | 5170345 | ● | 8,00 | 8,00 | 150 | 16 | 60 | 4 | 2 | HA |
| BCG010.020.072 FR5.0 Z2 025 HA B | 5170346 | ● | 10,00 | 10,00 | 72 | 20 | 25 | 5 | 2 | HA |
| BCG010.020.100 FR5.0 Z2 045 HA B | 5170347 | ● | 10,00 | 10,00 | 100 | 20 | 45 | 5 | 2 | HA |
| BCG010.020.125 FR5.0 Z2 060 HA B | 5170348 | ● | 10,00 | 10,00 | 125 | 20 | 60 | 5 | 2 | HA |

Bestellbeispiel Order example: 1 Stück piece 5170157oder or BCG00.8.01.2.050 FR0.4 Z2 005 HA B

Genaue Schnittwertempfehlung siehe Seite 298

Detailed cutting recommendations, see page 298

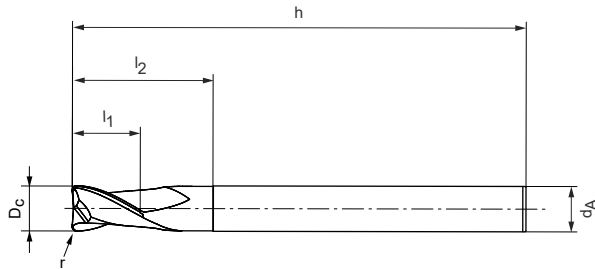
● Verfügbar ab Lager Available from stock

○ Kurzfristig lieferbar Shortly available

○ Lieferzeit auf Anfrage Delivery time on request

TORROtec SC Universal

Eckradiusfräser mit Hals „Form B“ Z2
Toric cutter neck „Form B“ Z2



| Hard Facts | |
|--------------------|--|
| Fräserdurchmesser: | 0,40 - 6,00 mm |
| Beschichtung: | AlTiN PVD |
| Schneidenzahl: | Z = 2 |
| Drallwinkel: | 30° |
| Radiusgenauigkeit: | R = ± 0,005 bis ø 6 mm R = ± 0,01 ab ø 8 mm |
| Anwendung: | Geeignet zur Bearbeitung von Werkstoffen bis 55 HRC. |
| Diameter: | 0.40 - 6.00 mm |
| Coating: | AlTiN PVD |
| Amount/Teeth: | Z = 2 |
| Helix angle: | 30° |
| Tolerance: | R = ± 0.005 until ø 6 mm R = ± 0.01 from ø 8 mm |
| Application: | Machining of materials up to 55 HRC. |

| BALLtec SC Universal | | |
|----------------------|-----|---|
| ISO | | |
| P | P.1 | ■ |
| | P.2 | ■ |
| | P.3 | ■ |
| | P.4 | ■ |
| | P.5 | ■ |
| M | M.1 | □ |
| | M.2 | □ |
| K | K.1 | □ |
| | K.2 | □ |
| | K.3 | □ |
| H | H.1 | ■ |
| | H.2 | □ |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | | z | Schaft Shank |
|-------------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|-------|----------------|----------------|------|---|----|-----------------|
| | | | D _C | d _A | h | l ₁ | l ₂ | r | | | |
| TCU00.4.00.4.050 FR0.1 Z2 001 HA B | 5164373 | ● | 0,40 | 4,00 | 50,00 | 0,45 | 0,75 | 0,10 | 2 | HA | |
| TCU00.4.00.4.050 FR0.1 Z2 001 HA B | 5164374 | ● | 0,40 | 4,00 | 50,00 | 0,45 | 1,00 | 0,10 | 2 | HA | |
| TCU00.4.00.4.050 FR0.1 Z2 01.5 HA B | 5164152 | ● | 0,40 | 4,00 | 50,00 | 0,45 | 1,50 | 0,10 | 2 | HA | |
| TCU00.4.00.4.050 FR0.1 Z2 002 HA B | 5164376 | ● | 0,40 | 4,00 | 50,00 | 0,45 | 2,00 | 0,10 | 2 | HA | |
| TCU00.4.00.4.060 FR0.1 Z2 002 HA B | 5164377 | ● | 0,40 | 6,00 | 60,00 | 0,45 | 2,00 | 0,10 | 2 | HA | |
| TCU00.4.00.4.060 FR0.1 Z2 003 HA B | 5164378 | ● | 0,40 | 6,00 | 60,00 | 0,45 | 3,00 | 0,10 | 2 | HA | |
| TCU00.5.00.6.050 FR0.1 Z2 01.5 HA B | 5164387 | ● | 0,50 | 4,00 | 50,00 | 0,60 | 1,50 | 0,10 | 2 | HA | |
| TCU00.5.00.6.050 FR0.1 Z2 002 HA B | 5164388 | ● | 0,50 | 4,00 | 50,00 | 0,60 | 2,00 | 0,10 | 2 | HA | |
| TCU00.5.00.6.050 FR0.1 Z2 003 HA B | 5164160 | ● | 0,50 | 4,00 | 50,00 | 0,60 | 3,00 | 0,10 | 2 | HA | |
| TCU00.5.00.6.050 FR0.1 Z2 004 HA B | 5164389 | ● | 0,50 | 4,00 | 50,00 | 0,60 | 4,00 | 0,10 | 2 | HA | |
| TCU00.5.00.6.050 FR0.1 Z2 005 HA B | 5164392 | ● | 0,50 | 4,00 | 50,00 | 0,60 | 5,00 | 0,10 | 2 | HA | |
| TCU00.5.00.6.050 FR0.1 Z2 006 HA B | 5164393 | ● | 0,50 | 4,00 | 50,00 | 0,60 | 6,00 | 0,10 | 2 | HA | |
| TCU00.6.00.7.050 FR0.1 Z2 002 HA B | 5164394 | ● | 0,60 | 4,00 | 50,00 | 0,70 | 2,00 | 0,10 | 2 | HA | |
| TCU00.6.00.7.050 FR0.1 Z2 003 HA B | 5164161 | ● | 0,60 | 4,00 | 50,00 | 0,70 | 3,00 | 0,10 | 2 | HA | |

Bestellbeispiel Order example: 1 Stück piece 5164373 oder or TCU00.4.00.4.050 FR0.1 Z2 001 HA B
Genauere Schnittwertempfehlung siehe Seite 299 und 300
Detailed cutting recommendations, see page 299 and 300

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

TORROtec SC Universal

Eckradiusfräser mit Hals „Form B“ Z2

Toric cutter neck „Form B“ Z2

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | z | Schaft Shank |
|------------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|-------|----------------|----------------|------|---|-----------------|
| | | | D _C | d _A | h | l ₁ | l ₂ | r | | |
| TCU00.6.00.7.050 FR0.1 Z2 004 HA B | 5164395 | ● | 0,60 | 4,00 | 50,00 | 0,70 | 4,00 | 0,10 | 2 | HA |
| TCU00.6.00.7.050 FR0.1 Z2 005 HA B | 5164397 | ● | 0,60 | 4,00 | 50,00 | 0,70 | 5,00 | 0,10 | 2 | HA |
| TCU00.6.00.7.050 FR0.1 Z2 006 HA B | 5164398 | ● | 0,60 | 4,00 | 50,00 | 0,70 | 6,00 | 0,10 | 2 | HA |
| TCU00.8.00.9.050 FR0.1 Z2 003 HA B | 5164163 | ● | 0,80 | 4,00 | 50,00 | 0,90 | 3,00 | 0,10 | 2 | HA |
| TCU00.8.00.9.050 FR0.1 Z2 004 HA B | 5164400 | ● | 0,80 | 4,00 | 50,00 | 0,90 | 4,00 | 0,10 | 2 | HA |
| TCU00.8.00.9.050 FR0.1 Z2 006 HA B | 5164401 | ● | 0,80 | 4,00 | 50,00 | 0,90 | 6,00 | 0,10 | 2 | HA |
| TCU00.8.00.9.050 FR0.1 Z2 008 HA B | 5164402 | ● | 0,80 | 4,00 | 50,00 | 0,90 | 8,00 | 0,10 | 2 | HA |
| TCU001.01.1.050 FR0.2 Z2 003 HA B | 5164165 | ● | 1,00 | 4,00 | 50,00 | 1,10 | 3,00 | 0,20 | 2 | HA |
| TCU001.01.1.050 FR0.2 Z2 004 HA B | 5164404 | ● | 1,00 | 4,00 | 50,00 | 1,10 | 4,00 | 0,20 | 2 | HA |
| TCU001.01.1.050 FR0.2 Z2 005 HA B | 5164166 | ● | 1,00 | 4,00 | 50,00 | 1,10 | 5,00 | 0,20 | 2 | HA |
| TCU001.01.1.050 FR0.2 Z2 006 HA B | 5164412 | ● | 1,00 | 4,00 | 50,00 | 1,10 | 6,00 | 0,20 | 2 | HA |
| TCU001.01.1.050 FR0.2 Z2 008 HA B | 5164413 | ● | 1,00 | 4,00 | 50,00 | 1,10 | 8,00 | 0,20 | 2 | HA |
| TCU001.01.1.050 FR0.2 Z2 010 HA B | 5164415 | ● | 1,00 | 4,00 | 50,00 | 1,10 | 10,00 | 0,20 | 2 | HA |
| TCU01.5.01.7.050 FR0.2 Z2 005 HA B | 5164416 | ● | 1,50 | 4,00 | 50,00 | 1,70 | 5,00 | 0,20 | 2 | HA |
| TCU01.5.01.7.050 FR0.2 Z2 006 HA B | 5164417 | ● | 1,50 | 4,00 | 50,00 | 1,70 | 6,00 | 0,20 | 2 | HA |
| TCU01.5.01.7.050 FR0.2 Z2 008 HA B | 5164418 | ● | 1,50 | 4,00 | 50,00 | 1,70 | 8,00 | 0,20 | 2 | HA |
| TCU01.5.01.7.050 FR0.2 Z2 010 HA B | 5164419 | ● | 1,50 | 4,00 | 50,00 | 1,70 | 10,00 | 0,20 | 2 | HA |
| TCU01.5.01.7.050 FR0.2 Z2 012 HA B | 5164420 | ● | 1,50 | 4,00 | 50,00 | 1,70 | 12,00 | 0,20 | 2 | HA |
| TCU01.5.01.7.050 FR0.2 Z2 015 HA B | 5164421 | ● | 1,50 | 4,00 | 50,00 | 1,70 | 15,00 | 0,20 | 2 | HA |
| TCU002.02.2.050 FR0.2 Z2 006 HA B | 5164167 | ● | 2,00 | 4,00 | 50,00 | 2,20 | 6,00 | 0,20 | 2 | HA |
| TCU002.02.2.050 FR0.2 Z2 008 HA B | 5164423 | ● | 2,00 | 4,00 | 50,00 | 2,20 | 8,00 | 0,20 | 2 | HA |
| TCU002.02.2.050 FR0.2 Z2 010 HA B | 5164424 | ● | 2,00 | 4,00 | 50,00 | 2,20 | 10,00 | 0,20 | 2 | HA |
| TCU002.02.2.050 FR0.2 Z2 012 HA B | 5164426 | ● | 2,00 | 4,00 | 50,00 | 2,20 | 12,00 | 0,20 | 2 | HA |
| TCU002.02.2.050 FR0.2 Z2 015 HA B | 5164427 | ● | 2,00 | 4,00 | 50,00 | 2,20 | 15,00 | 0,20 | 2 | HA |
| TCU002.02.2.050 FR0.2 Z2 018 HA B | 5164430 | ● | 2,00 | 4,00 | 50,00 | 2,20 | 18,00 | 0,20 | 2 | HA |
| TCU002.02.2.050 FR0.2 Z2 020 HA B | 5164431 | ● | 2,00 | 4,00 | 50,00 | 2,20 | 20,00 | 0,20 | 2 | HA |
| TCU002.02.2.050 FR0.5 Z2 006 HA B | 5164170 | ● | 2,00 | 4,00 | 50,00 | 2,20 | 6,00 | 0,50 | 2 | HA |
| TCU002.02.2.050 FR0.5 Z2 008 HA B | 5164443 | ● | 2,00 | 4,00 | 50,00 | 2,20 | 8,00 | 0,50 | 2 | HA |
| TCU002.02.2.050 FR0.5 Z2 010 HA B | 5164445 | ● | 2,00 | 4,00 | 50,00 | 2,20 | 10,00 | 0,50 | 2 | HA |
| TCU002.02.2.050 FR0.5 Z2 012 HA B | 5164448 | ● | 2,00 | 4,00 | 50,00 | 2,20 | 12,00 | 0,50 | 2 | HA |
| TCU002.02.2.050 FR0.5 Z2 015 HA B | 5164449 | ● | 2,00 | 4,00 | 50,00 | 2,20 | 15,00 | 0,50 | 2 | HA |
| TCU002.02.2.050 FR0.5 Z2 018 HA B | 5164450 | ● | 2,00 | 4,00 | 50,00 | 2,20 | 18,00 | 0,50 | 2 | HA |
| TCU002.02.2.050 FR0.5 Z2 020 HA B | 5164452 | ● | 2,00 | 4,00 | 50,00 | 2,20 | 20,00 | 0,50 | 2 | HA |
| TCU003.03.3.060 FR0.2 Z2 010 HA B | 5164171 | ● | 3,00 | 6,00 | 60,00 | 3,30 | 10,00 | 0,20 | 2 | HA |
| TCU003.03.3.060 FR0.2 Z2 015 HA B | 5164453 | ● | 3,00 | 6,00 | 60,00 | 3,30 | 15,00 | 0,20 | 2 | HA |
| TCU003.03.3.060 FR0.2 Z2 020 HA B | 5164454 | ● | 3,00 | 6,00 | 60,00 | 3,30 | 20,00 | 0,20 | 2 | HA |
| TCU003.03.3.075 FR0.2 Z2 025 HA B | 5164455 | ● | 3,00 | 6,00 | 75,00 | 3,30 | 25,00 | 0,20 | 2 | HA |
| TCU003.03.3.060 FR0.5 Z2 010 HA B | 5164175 | ● | 3,00 | 6,00 | 60,00 | 3,30 | 10,00 | 0,50 | 2 | HA |
| TCU003.03.3.060 FR0.5 Z2 015 HA B | 5164457 | ● | 3,00 | 6,00 | 60,00 | 3,30 | 15,00 | 0,50 | 2 | HA |
| TCU003.03.3.060 FR0.5 Z2 020 HA B | 5164458 | ● | 3,00 | 6,00 | 60,00 | 3,30 | 20,00 | 0,50 | 2 | HA |
| TCU003.03.3.075 FR0.5 Z2 025 HA B | 5164459 | ● | 3,00 | 6,00 | 75,00 | 3,30 | 25,00 | 0,50 | 2 | HA |
| TCU004.04.4.060 FR0.2 Z2 010 HA B | 5164460 | ● | 4,00 | 6,00 | 60,00 | 4,40 | 10,00 | 0,20 | 2 | HA |
| TCU004.04.4.060 FR0.2 Z2 015 HA B | 5164177 | ● | 4,00 | 6,00 | 60,00 | 4,40 | 15,00 | 0,20 | 2 | HA |
| TCU004.04.4.060 FR0.2 Z2 020 HA B | 5164462 | ● | 4,00 | 6,00 | 60,00 | 4,40 | 20,00 | 0,20 | 2 | HA |
| TCU004.04.4.075 FR0.2 Z2 025 HA B | 5164463 | ● | 4,00 | 6,00 | 75,00 | 4,40 | 25,00 | 0,20 | 2 | HA |
| TCU004.04.4.075 FR0.2 Z2 030 HA B | 5164464 | ● | 4,00 | 6,00 | 75,00 | 4,40 | 30,00 | 0,20 | 2 | HA |
| TCU004.04.4.075 FR0.2 Z2 035 HA B | 5164465 | ● | 4,00 | 6,00 | 75,00 | 4,40 | 35,00 | 0,20 | 2 | HA |
| TCU004.04.4.060 FR0.5 Z2 010 HA B | 5164466 | ● | 4,00 | 6,00 | 60,00 | 4,40 | 10,00 | 0,50 | 2 | HA |
| TCU004.04.4.060 FR0.5 Z2 015 HA B | 5164183 | ● | 4,00 | 6,00 | 60,00 | 4,40 | 15,00 | 0,50 | 2 | HA |
| TCU004.04.4.060 FR0.5 Z2 020 HA B | 5164468 | ● | 4,00 | 6,00 | 60,00 | 4,40 | 20,00 | 0,50 | 2 | HA |
| TCU004.04.4.075 FR0.5 Z2 025 HA B | 5164469 | ● | 4,00 | 6,00 | 75,00 | 4,40 | 25,00 | 0,50 | 2 | HA |
| TCU004.04.4.075 FR0.5 Z2 030 HA B | 5164470 | ● | 4,00 | 6,00 | 75,00 | 4,40 | 30,00 | 0,50 | 2 | HA |
| TCU004.04.4.075 FR0.5 Z2 035 HA B | 5164471 | ● | 4,00 | 6,00 | 75,00 | 4,40 | 35,00 | 0,50 | 2 | HA |

Bestellbeispiel Order example: 1 Stück piece 5164395 oder or TCU00.6.00.7.050 FR0.1 Z2 004 HA B
 Genaue Schnittwertempfehlung siehe Seite 299 und 300
 Detailed cutting recommendations, see page 299 and 300

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

TORROtec SC Universal

Eckradiusfräser mit Hals „Form B“ Z2

Toric cutter neck „Form B“ Z2

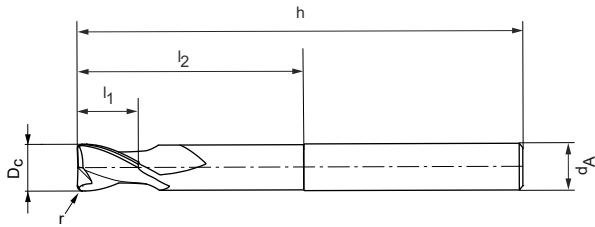
| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | z | Schaft Shank |
|----------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|-------|----------------|----------------|------|---|-----------------|
| | | | D _C | d _A | h | l ₁ | l ₂ | r | | |
| TCU006.007.060 FR0.2 Z2 015 HA B | 5164187 | ● | 6,00 | 6,00 | 60,00 | 7,00 | 15,00 | 0,20 | 2 | HA |
| TCU006.007.060 FR0.2 Z2 020 HA B | 5164472 | ⦿ | 6,00 | 6,00 | 60,00 | 7,00 | 20,00 | 0,20 | 2 | HA |
| TCU006.007.060 FR0.2 Z2 025 HA B | 5164474 | ⦿ | 6,00 | 6,00 | 60,00 | 7,00 | 25,00 | 0,20 | 2 | HA |
| TCU006.007.075 FR0.2 Z2 030 HA B | 5164475 | ⦿ | 6,00 | 6,00 | 75,00 | 7,00 | 30,00 | 0,20 | 2 | HA |
| TCU006.007.075 FR0.2 Z2 035 HA B | 5164476 | ⦿ | 6,00 | 6,00 | 75,00 | 7,00 | 35,00 | 0,20 | 2 | HA |
| TCU006.007.060 FR0.3 Z2 015 HA B | 5164477 | ⦿ | 6,00 | 6,00 | 60,00 | 7,00 | 15,00 | 0,30 | 2 | HA |
| TCU006.007.060 FR0.3 Z2 020 HA B | 5164478 | ⦿ | 6,00 | 6,00 | 60,00 | 7,00 | 20,00 | 0,30 | 2 | HA |
| TCU006.007.060 FR0.3 Z2 025 HA B | 5164479 | ⦿ | 6,00 | 6,00 | 60,00 | 7,00 | 25,00 | 0,30 | 2 | HA |
| TCU006.007.075 FR0.3 Z2 030 HA B | 5164480 | ⦿ | 6,00 | 6,00 | 75,00 | 7,00 | 30,00 | 0,30 | 2 | HA |
| TCU006.007.075 FR0.3 Z2 035 HA B | 5164481 | ⦿ | 6,00 | 6,00 | 75,00 | 7,00 | 35,00 | 0,30 | 2 | HA |
| TCU006.007.060 FR0.5 Z2 015 HA B | 5164188 | ● | 6,00 | 6,00 | 60,00 | 7,00 | 15,00 | 0,50 | 2 | HA |
| TCU006.007.060 FR0.5 Z2 020 HA B | 5164482 | ⦿ | 6,00 | 6,00 | 60,00 | 7,00 | 20,00 | 0,50 | 2 | HA |
| TCU006.007.060 FR0.5 Z2 025 HA B | 5164485 | ⦿ | 6,00 | 6,00 | 60,00 | 7,00 | 25,00 | 0,50 | 2 | HA |
| TCU006.007.075 FR0.5 Z2 030 HA B | 5164486 | ⦿ | 6,00 | 6,00 | 75,00 | 7,00 | 30,00 | 0,50 | 2 | HA |
| TCU006.007.075 FR0.5 Z2 035 HA B | 5164488 | ⦿ | 6,00 | 6,00 | 75,00 | 7,00 | 35,00 | 0,50 | 2 | HA |
| TCU006.007.060 FR1.0 Z2 015 HA B | 5164190 | ● | 6,00 | 6,00 | 60,00 | 7,00 | 15,00 | 1,00 | 2 | HA |
| TCU006.007.060 FR1.0 Z2 020 HA B | 5164491 | ⦿ | 6,00 | 6,00 | 60,00 | 7,00 | 20,00 | 1,00 | 2 | HA |
| TCU006.007.060 FR1.0 Z2 025 HA B | 5164495 | ⦿ | 6,00 | 6,00 | 60,00 | 7,00 | 25,00 | 1,00 | 2 | HA |
| TCU006.007.075 FR1.0 Z2 030 HA B | 5164496 | ⦿ | 6,00 | 6,00 | 75,00 | 7,00 | 30,00 | 1,00 | 2 | HA |
| TCU006.007.075 FR1.0 Z2 035 HA B | 5164497 | ⦿ | 6,00 | 6,00 | 75,00 | 7,00 | 35,00 | 1,00 | 2 | HA |

Bestellbeispiel Order example: 1 Stück piece 5164187 oder or TCU006.007.060 FR0.2 Z2 015 HA B
 Genaue Schnittwertempfehlung siehe Seite 299 und 300
 Detailed cutting recommendations, see page 299 and 300

- Verfügbar ab Lager Available from stock
- ⦿ Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

TORROtec SC Hardened

Eckradiusfräser mit Hals „Form B“ Z2
Toric cutter neck „Form B“ Z2



| Hard Facts | |
|--------------------|---|
| Fräserdurchmesser: | 0,40 - 6,00 mm |
| Beschichtung: | TiSiN PVD |
| Schneidenzahl: | Z = 2 |
| Drallwinkel: | 28° |
| Radiusgenauigkeit: | R = ±0,005 wenn d1 ≤ 6 mm R = ±0,01 wenn d1 > 6 mm |
| Anwendung: | Geeignet zur Bearbeitung von Werkstoffen bis 66 HRC. |
| Diameter: | 0.40 - 6.00 mm |
| Coating: | TiSiN PVD |
| Amount/Teeth: | Z = 2 |
| Helix angle: | 28° |
| Tolerance: | R = ±0.005 if d1 ≤ 6 mm R = ±0.01 if d1 > 6 mm |
| Application: | Machining of materials up to 66 HRC. |

| TORROtec SC Hardened | | |
|----------------------|-----|-------------------------------------|
| ISO | | |
| P | P.1 | <input type="checkbox"/> |
| | P.2 | <input type="checkbox"/> |
| | P.3 | <input type="checkbox"/> |
| | P.4 | <input type="checkbox"/> |
| | P.5 | <input type="checkbox"/> |
| K | K.1 | <input type="checkbox"/> |
| | K.2 | <input type="checkbox"/> |
| | K.3 | <input type="checkbox"/> |
| H | H.1 | <input checked="" type="checkbox"/> |
| | H.2 | <input checked="" type="checkbox"/> |
| | H.3 | <input checked="" type="checkbox"/> |
| | H.4 | <input checked="" type="checkbox"/> |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | | z | Schaft Shank |
|-------------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|----|----------------|----------------|-----|---|----|-----------------|
| | | | D _c | d _A | h | l ₁ | l ₂ | r | | | |
| TCH00.4.00.5.050 FR0.1 Z2 00.7 HA B | 5170374 | ● | 0,40 | 4,00 | 50 | 0,5 | 0,75 | 0,1 | 2 | HA | |
| TCH00.4.00.5.050 FR0.1 Z2 001 HA B | 5170375 | ● | 0,40 | 4,00 | 50 | 0,5 | 1 | 0,1 | 2 | HA | |
| TCH00.4.00.5.050 FR0.1 Z2 01.5 HA B | 5170376 | ● | 0,40 | 4,00 | 50 | 0,5 | 1,5 | 0,1 | 2 | HA | |
| TCH00.4.00.5.050 FR0.1 Z2 002 HA B | 5170377 | ● | 0,40 | 4,00 | 50 | 0,5 | 2 | 0,1 | 2 | HA | |
| TCH00.4.00.5.060 FR0.1 Z2 002 HA B | 5170378 | ● | 0,40 | 6,00 | 60 | 0,5 | 2 | 0,1 | 2 | HA | |
| TCH00.4.00.5.060 FR0.1 Z2 003 HA B | 5170379 | ● | 0,40 | 6,00 | 60 | 0,5 | 3 | 0,1 | 2 | HA | |
| TCH00.5.00.6.050 FR0.1 Z2 01.5 HA B | 5170380 | ● | 0,50 | 4,00 | 50 | 0,6 | 1,5 | 0,1 | 2 | HA | |
| TCH00.5.00.6.050 FR0.1 Z2 002 HA B | 5170381 | ● | 0,50 | 4,00 | 50 | 0,6 | 2 | 0,1 | 2 | HA | |
| TCH00.5.00.6.050 FR0.1 Z2 003 HA B | 5170382 | ● | 0,50 | 4,00 | 50 | 0,6 | 3 | 0,1 | 2 | HA | |
| TCH00.5.00.6.050 FR0.1 Z2 004 HA B | 5170383 | ● | 0,50 | 4,00 | 50 | 0,6 | 4 | 0,1 | 2 | HA | |
| TCH00.5.00.6.050 FR0.1 Z2 005 HA B | 5170384 | ● | 0,50 | 4,00 | 50 | 0,6 | 5 | 0,1 | 2 | HA | |
| TCH00.5.00.6.050 FR0.1 Z2 006 HA B | 5170385 | ● | 0,50 | 4,00 | 50 | 0,6 | 6 | 0,1 | 2 | HA | |

Bestellbeispiel Order example: 1 Stück piece 5170374 oder or TCH00.4.00.5.050 FR0.1 Z2 00.7 HA B
Genauere Schnittwertempfehlung siehe Seite 300
Detailed cutting recommendations, see page 300

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

TORROtec SC Hardened

Eckradiusfräser mit Hals „Form B“ Z2

Toric cutter neck „Form B“ Z2

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | z | Schaft Shank |
|------------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|----|----------------|----------------|-----|---|-----------------|
| | | | D _C | d _A | h | l ₁ | l ₂ | r | | |
| TCH00.6.00.7.050 FR0.1 Z2 002 HA B | 5170393 | ● | 0,60 | 4,00 | 50 | 0,7 | 2 | 0,1 | 2 | HA |
| TCH00.6.00.7.050 FR0.1 Z2 003 HA B | 5170394 | ● | 0,60 | 4,00 | 50 | 0,7 | 3 | 0,1 | 2 | HA |
| TCH00.6.00.7.050 FR0.1 Z2 004 HA B | 5170395 | ● | 0,60 | 4,00 | 50 | 0,7 | 4 | 0,1 | 2 | HA |
| TCH00.6.00.7.050 FR0.1 Z2 005 HA B | 5170396 | ● | 0,60 | 4,00 | 50 | 0,7 | 5 | 0,1 | 2 | HA |
| TCH00.6.00.7.050 FR0.1 Z2 006 HA B | 5170397 | ● | 0,60 | 4,00 | 50 | 0,7 | 6 | 0,1 | 2 | HA |
| TCH00.8.00.9.050 FR0.1 Z2 003 HA B | 5170398 | ● | 0,80 | 4,00 | 50 | 0,9 | 3 | 0,1 | 2 | HA |
| TCH00.8.00.9.050 FR0.1 Z2 004 HA B | 5170399 | ● | 0,80 | 4,00 | 50 | 0,9 | 4 | 0,1 | 2 | HA |
| TCH00.8.00.9.050 FR0.1 Z2 006 HA B | 5170400 | ● | 0,80 | 4,00 | 50 | 0,9 | 6 | 0,1 | 2 | HA |
| TCH00.8.00.9.050 FR0.1 Z2 008 HA B | 5170401 | ● | 0,80 | 4,00 | 50 | 0,9 | 8 | 0,1 | 2 | HA |
| TCH001.01.2.050 FR0.2 Z2 003 HA B | 5170402 | ● | 1,00 | 4,00 | 50 | 1,2 | 3 | 0,2 | 2 | HA |
| TCH001.01.2.050 FR0.2 Z2 004 HA B | 5170403 | ● | 1,00 | 4,00 | 50 | 1,2 | 4 | 0,2 | 2 | HA |
| TCH001.01.2.050 FR0.2 Z2 005 HA B | 5170404 | ● | 1,00 | 4,00 | 50 | 1,2 | 5 | 0,2 | 2 | HA |
| TCH001.01.2.050 FR0.2 Z2 006 HA B | 5170411 | ● | 1,00 | 4,00 | 50 | 1,2 | 6 | 0,2 | 2 | HA |
| TCH001.01.2.050 FR0.2 Z2 008 HA B | 5170412 | ● | 1,00 | 4,00 | 50 | 1,2 | 8 | 0,2 | 2 | HA |
| TCH001.01.2.050 FR0.2 Z2 010 HA B | 5170413 | ● | 1,00 | 4,00 | 50 | 1,2 | 10 | 0,2 | 2 | HA |
| TCH01.5.01.7.050 FR0.2 Z2 005 HA B | 5170414 | ● | 1,50 | 4,00 | 50 | 1,7 | 5 | 0,2 | 2 | HA |
| TCH01.5.01.7.050 FR0.2 Z2 006 HA B | 5170415 | ● | 1,50 | 4,00 | 50 | 1,7 | 6 | 0,2 | 2 | HA |
| TCH01.5.01.7.050 FR0.2 Z2 008 HA B | 5170416 | ● | 1,50 | 4,00 | 50 | 1,7 | 8 | 0,2 | 2 | HA |
| TCH01.5.01.7.050 FR0.2 Z2 010 HA B | 5170417 | ● | 1,50 | 4,00 | 50 | 1,7 | 10 | 0,2 | 2 | HA |
| TCH01.5.01.7.050 FR0.2 Z2 012 HA B | 5170418 | ● | 1,50 | 4,00 | 50 | 1,7 | 12 | 0,2 | 2 | HA |
| TCH01.5.01.7.050 FR0.2 Z2 015 HA B | 5170431 | ● | 1,50 | 4,00 | 50 | 1,7 | 15 | 0,2 | 2 | HA |
| TCH002.02.3.050 FR0.2 Z2 006 HA B | 5170432 | ● | 2,00 | 4,00 | 50 | 2,3 | 6 | 0,2 | 2 | HA |
| TCH002.02.3.050 FR0.2 Z2 008 HA B | 5170433 | ● | 2,00 | 4,00 | 50 | 2,3 | 8 | 0,2 | 2 | HA |
| TCH002.02.3.050 FR0.2 Z2 010 HA B | 5170434 | ● | 2,00 | 4,00 | 50 | 2,3 | 10 | 0,2 | 2 | HA |
| TCH002.02.3.050 FR0.2 Z2 012 HA B | 5170435 | ● | 2,00 | 4,00 | 50 | 2,3 | 12 | 0,2 | 2 | HA |
| TCH002.02.3.050 FR0.2 Z2 015 HA B | 5170436 | ● | 2,00 | 4,00 | 50 | 2,3 | 15 | 0,2 | 2 | HA |
| TCH002.02.3.050 FR0.2 Z2 018 HA B | 5170437 | ● | 2,00 | 4,00 | 50 | 2,3 | 18 | 0,2 | 2 | HA |
| TCH002.02.3.050 FR0.2 Z2 020 HA B | 5170438 | ● | 2,00 | 4,00 | 50 | 2,3 | 20 | 0,2 | 2 | HA |
| TCH002.02.3.050 FR0.5 Z2 006 HA B | 5170446 | ● | 2,00 | 4,00 | 50 | 2,3 | 6 | 0,5 | 2 | HA |
| TCH002.02.3.050 FR0.5 Z2 008 HA B | 5170447 | ● | 2,00 | 4,00 | 50 | 2,3 | 8 | 0,5 | 2 | HA |
| TCH002.02.3.050 FR0.5 Z2 010 HA B | 5170448 | ● | 2,00 | 4,00 | 50 | 2,3 | 10 | 0,5 | 2 | HA |
| TCH002.02.3.050 FR0.5 Z2 012 HA B | 5170449 | ● | 2,00 | 4,00 | 50 | 2,3 | 12 | 0,5 | 2 | HA |
| TCH002.02.3.050 FR0.5 Z2 015 HA B | 5170450 | ● | 2,00 | 4,00 | 50 | 2,3 | 15 | 0,5 | 2 | HA |
| TCH002.02.3.050 FR0.5 Z2 018 HA B | 5170451 | ● | 2,00 | 4,00 | 50 | 2,3 | 18 | 0,5 | 2 | HA |
| TCH002.02.3.050 FR0.5 Z2 020 HA B | 5170452 | ● | 2,00 | 4,00 | 50 | 2,3 | 20 | 0,5 | 2 | HA |
| TCH003.03.5.060 FR0.2 Z2 010 HA B | 5170453 | ● | 3,00 | 6,00 | 60 | 3,5 | 10 | 0,2 | 2 | HA |
| TCH003.03.5.060 FR0.2 Z2 015 HA B | 5170454 | ● | 3,00 | 6,00 | 60 | 3,5 | 15 | 0,2 | 2 | HA |
| TCH003.03.5.060 FR0.2 Z2 020 HA B | 5170455 | ● | 3,00 | 6,00 | 60 | 3,5 | 20 | 0,2 | 2 | HA |
| TCH003.03.5.075 FR0.2 Z2 025 HA B | 5170456 | ● | 3,00 | 6,00 | 75 | 3,5 | 25 | 0,2 | 2 | HA |
| TCH003.03.5.060 FR0.5 Z2 010 HA B | 5170457 | ● | 3,00 | 6,00 | 60 | 3,5 | 10 | 0,5 | 2 | HA |
| TCH003.03.5.060 FR0.5 Z2 015 HA B | 5170470 | ● | 3,00 | 6,00 | 60 | 3,5 | 15 | 0,5 | 2 | HA |
| TCH003.03.5.060 FR0.5 Z2 020 HA B | 5170471 | ● | 3,00 | 6,00 | 60 | 3,5 | 20 | 0,5 | 2 | HA |
| TCH003.03.5.075 FR0.5 Z2 025 HA B | 5170472 | ● | 3,00 | 6,00 | 75 | 3,5 | 25 | 0,5 | 2 | HA |
| TCH004.04.6.060 FR0.2 Z2 010 HA B | 5170473 | ● | 4,00 | 6,00 | 60 | 4,6 | 10 | 0,2 | 2 | HA |
| TCH004.04.6.060 FR0.2 Z2 015 HA B | 5170474 | ● | 4,00 | 6,00 | 60 | 4,6 | 15 | 0,2 | 2 | HA |
| TCH004.04.6.060 FR0.2 Z2 020 HA B | 5170475 | ● | 4,00 | 6,00 | 60 | 4,6 | 20 | 0,2 | 2 | HA |
| TCH004.04.6.075 FR0.2 Z2 025 HA B | 5170476 | ● | 4,00 | 6,00 | 75 | 4,6 | 25 | 0,2 | 2 | HA |
| TCH004.04.6.075 FR0.2 Z2 030 HA B | 5170477 | ● | 4,00 | 6,00 | 75 | 4,6 | 30 | 0,2 | 2 | HA |
| TCH004.04.6.075 FR0.2 Z2 035 HA B | 5170479 | ● | 4,00 | 6,00 | 75 | 4,6 | 35 | 0,2 | 2 | HA |
| TCH004.04.6.060 FR0.5 Z2 010 HA B | 5170483 | ● | 4,00 | 6,00 | 60 | 4,6 | 10 | 0,5 | 2 | HA |
| TCH004.04.6.060 FR0.5 Z2 015 HA B | 5170485 | ● | 4,00 | 6,00 | 60 | 4,6 | 15 | 0,5 | 2 | HA |

Bestellbeispiel Order example: 1 Stück piece 5170393 oder or TCH00.6.00.7.050 FR0.1 Z2 002 HA B
 Genaue Schnittwertempfehlung siehe Seite 300
 Detailed cutting recommendations, see page 300

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

TORROtec SC Hardened

Eckradiusfräser mit Hals „Form B“ Z2

Toric cutter neck „Form B“ Z2

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | z | Schaft Shank |
|-----------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|----|----------------|----------------|-----|---|-----------------|
| | | | D _C | d _A | h | l ₁ | l ₂ | r | | |
| TCH004.04.6.060 FR0.5 Z2 020 HA B | 5170486 | ● | 4,00 | 6,00 | 60 | 4,6 | 20 | 0,5 | 2 | HA |
| TCH004.04.6.075 FR0.5 Z2 025 HA B | 5170487 | ● | 4,00 | 6,00 | 75 | 4,6 | 25 | 0,5 | 2 | HA |
| TCH004.04.6.075 FR0.5 Z2 030 HA B | 5170488 | ● | 4,00 | 6,00 | 75 | 4,6 | 30 | 0,5 | 2 | HA |
| TCH004.04.6.075 FR0.5 Z2 035 HA B | 5170489 | ● | 4,00 | 6,00 | 75 | 4,6 | 35 | 0,5 | 2 | HA |
| TCH006.06.9.060 FR0.2 Z2 015 HA B | 5170490 | ● | 6,00 | 6,00 | 60 | 6,9 | 15 | 0,2 | 2 | HA |
| TCH006.06.9.060 FR0.2 Z2 020 HA B | 5170501 | ● | 6,00 | 6,00 | 60 | 6,9 | 20 | 0,2 | 2 | HA |
| TCH006.06.9.060 FR0.2 Z2 025 HA B | 5170502 | ● | 6,00 | 6,00 | 60 | 6,9 | 25 | 0,2 | 2 | HA |
| TCH006.06.9.075 FR0.2 Z2 030 HA B | 5170503 | ● | 6,00 | 6,00 | 75 | 6,9 | 30 | 0,2 | 2 | HA |
| TCH006.06.9.075 FR0.2 Z2 035 HA B | 5170504 | ● | 6,00 | 6,00 | 75 | 6,9 | 35 | 0,2 | 2 | HA |
| TCH006.06.9.060 FR0.3 Z2 015 HA B | 5170505 | ● | 6,00 | 6,00 | 60 | 6,9 | 15 | 0,3 | 2 | HA |
| TCH006.06.9.060 FR0.3 Z2 020 HA B | 5170506 | ● | 6,00 | 6,00 | 60 | 6,9 | 20 | 0,3 | 2 | HA |
| TCH006.06.9.060 FR0.3 Z2 025 HA B | 5170507 | ● | 6,00 | 6,00 | 60 | 6,9 | 25 | 0,3 | 2 | HA |
| TCH006.06.9.075 FR0.3 Z2 030 HA B | 5170508 | ● | 6,00 | 6,00 | 75 | 6,9 | 30 | 0,3 | 2 | HA |
| TCH006.06.9.075 FR0.3 Z2 035 HA B | 5170511 | ● | 6,00 | 6,00 | 75 | 6,9 | 35 | 0,3 | 2 | HA |
| TCH006.06.9.060 FR0.5 Z2 015 HA B | 5170512 | ● | 6,00 | 6,00 | 60 | 6,9 | 15 | 0,5 | 2 | HA |
| TCH006.06.9.060 FR0.5 Z2 020 HA B | 5170513 | ● | 6,00 | 6,00 | 60 | 6,9 | 20 | 0,5 | 2 | HA |
| TCH006.06.9.060 FR0.5 Z2 025 HA B | 5170514 | ● | 6,00 | 6,00 | 60 | 6,9 | 25 | 0,5 | 2 | HA |
| TCH006.06.9.075 FR0.5 Z2 030 HA B | 5170515 | ● | 6,00 | 6,00 | 75 | 6,9 | 30 | 0,5 | 2 | HA |
| TCH006.06.9.075 FR0.5 Z2 035 HA B | 5170516 | ● | 6,00 | 6,00 | 75 | 6,9 | 35 | 0,5 | 2 | HA |
| TCH006.06.9.060 FR1.0 Z2 015 HA B | 5170517 | ● | 6,00 | 6,00 | 60 | 6,9 | 15 | 1,0 | 2 | HA |
| TCH006.06.9.060 FR1.0 Z2 020 HA B | 5170518 | ● | 6,00 | 6,00 | 60 | 6,9 | 20 | 1,0 | 2 | HA |
| TCH006.06.9.060 FR1.0 Z2 025 HA B | 5170519 | ● | 6,00 | 6,00 | 60 | 6,9 | 25 | 1,0 | 2 | HA |
| TCH006.06.9.075 FR1.0 Z2 030 HA B | 5170520 | ● | 6,00 | 6,00 | 75 | 6,9 | 30 | 1,0 | 2 | HA |
| TCH006.06.9.075 FR1.0 Z2 035 HA B | 5170521 | ● | 6,00 | 6,00 | 75 | 6,9 | 35 | 1,0 | 2 | HA |

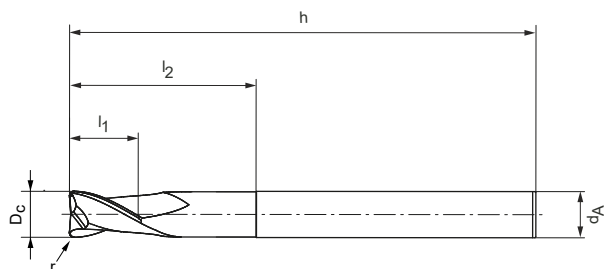
Bestellbeispiel Order example: 1 Stück piece 5170486 oder or TCH004.04.6.060 FR0.5 Z2 020 HA B
 Genaue Schnittwertempfehlung siehe Seite 300
 Detailed cutting recommendations, see page 300

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

TORROtec SC N

Eckradiusfräser mit Hals „Form B“ Z2

Toric cutter neck „Form B“ Z2



| Hard Facts | |
|--------------------|--|
| Fräserdurchmesser: | 2,00 - 20,00 mm |
| Beschichtung: | TiBX2r PVD |
| Schneidenzahl: | Z = 2 |
| Drallwinkel: | 30° |
| Radiusgenauigkeit: | R = ± 0,005 bis ø 6 mm R = ± 0,01 ab ø 8 mm |
| Diameter: | 2.00 - 20.00 mm |
| Coating: | TiBX2r PVD |
| Amount/Teeth: | Z = 2 |
| Helix angle: | 30° |
| Tolerance: | R = ± 0.005 until ø 6 mm R = ± 0.01 from ø 8 mm |

| TORROtec SC | | |
|-------------|-----|-------------------------------------|
| ISO | | |
| M | M.1 | <input type="checkbox"/> |
| | M.2 | <input type="checkbox"/> |
| N | N.1 | <input checked="" type="checkbox"/> |
| | N.2 | <input checked="" type="checkbox"/> |
| | N.3 | <input type="checkbox"/> |

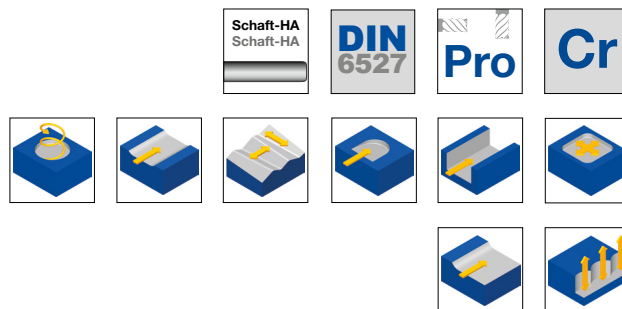
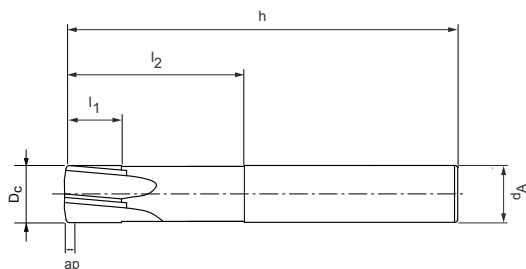
| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | z | Schaft Shank |
|----------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|--------|----------------|----------------|------|---|-----------------|
| | | | D _C | d _A | h | l ₁ | l ₂ | r | | |
| TCN002.002.050 FR0.2 Z2 010 HA B | 5164499 | ● | 2,00 | 4,00 | 50,00 | 2,00 | 10,00 | 0,20 | 2 | HA |
| TCN002.002.050 FR0.5 Z2 010 HA B | 5164194 | ● | 2,00 | 4,00 | 50,00 | 2,00 | 10,00 | 0,50 | 2 | HA |
| TCN003.003.050 FR0.2 Z2 012 HA B | 5164405 | ● | 3,00 | 4,00 | 50,00 | 3,00 | 12,00 | 0,20 | 2 | HA |
| TCN003.003.050 FR0.5 Z2 012 HA B | 5164195 | ● | 3,00 | 4,00 | 50,00 | 3,00 | 12,00 | 0,50 | 2 | HA |
| TCN004.004.050 FR0.2 Z2 015 HA B | 5164406 | ● | 4,00 | 4,00 | 50,00 | 4,00 | 15,00 | 0,20 | 2 | HA |
| TCN004.004.050 FR0.5 Z2 015 HA B | 5164196 | ● | 4,00 | 4,00 | 50,00 | 4,00 | 15,00 | 0,50 | 2 | HA |
| TCN006.006.057 FR0.2 Z2 021 HA B | 5164407 | ● | 6,00 | 6,00 | 57,00 | 6,00 | 21,00 | 0,20 | 2 | HA |
| TCN006.006.057 FR0.5 Z2 021 HA B | 5164198 | ● | 6,00 | 6,00 | 57,00 | 6,00 | 21,00 | 0,50 | 2 | HA |
| TCN006.006.057 FR1.0 Z2 021 HA B | 5164409 | ● | 6,00 | 6,00 | 57,00 | 6,00 | 21,00 | 1,00 | 2 | HA |
| TCN006.006.075 FR1.0 Z2 030 HA B | 5164201 | ● | 6,00 | 6,00 | 75,00 | 6,00 | 30,00 | 1,00 | 2 | HA |
| TCN008.008.063 FR0.5 Z2 027 HA B | 5164202 | ● | 8,00 | 8,00 | 63,00 | 8,00 | 27,00 | 0,50 | 2 | HA |
| TCN008.008.063 FR1.0 Z2 030 HA B | 5164204 | ● | 8,00 | 8,00 | 63,00 | 8,00 | 30,00 | 1,00 | 2 | HA |
| TCN010.010.072 FR0.5 Z2 032 HA B | 5164501 | ● | 10,00 | 10,00 | 72,00 | 10,00 | 32,00 | 0,50 | 2 | HA |
| TCN010.010.100 FR1.0 Z2 044 HA B | 5164503 | ● | 10,00 | 10,00 | 100,00 | 10,00 | 40,00 | 1,00 | 2 | HA |
| TCN012.012.110 FR1.5 Z2 060 HA B | 5164505 | ● | 12,00 | 12,00 | 110,00 | 12,00 | 60,00 | 1,50 | 2 | HA |
| TCN016.016.092 FR2.0 Z2 044 HA B | 5164507 | ● | 16,00 | 16,00 | 92,00 | 16,00 | 44,00 | 2,00 | 2 | HA |
| TCN020.020.104 FR2.0 Z2 054 HA B | 5164509 | ● | 20,00 | 20,00 | 104,00 | 20,00 | 54,00 | 2,00 | 2 | HA |

Bestellbeispiel Order example: 1 Stück piece 5164499 oder or TCN002.002.050 FR0.2 Z2 010 HA B
 Genaue Schnittwertempfehlung siehe Seite 302
 Detailed cutting recommendations, see page 302

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

FEEDtec SC Universal

Hochvorschubfräser mit Hals Z4
Highfeed cutter neck Z4



| Hard Facts | |
|--------------------|--|
| Fräserdurchmesser: | 3,00 - 12,00 mm |
| Beschichtung: | AlTiN PVD |
| Schneidenzahl: | Z = 4 |
| Drallwinkel: | 5° |
| Anwendung: | Speziell zum Schruppen von Bauteilen mit einer Härte bis 55HRC. Sehr gute Laufruhe auch bei großen Tiefe. |
| Diameter: | 3.00 - 12.00 mm |
| Coating: | AlTiN PVD |
| Amount/Teeth: | Z = 4 |
| Helix angle: | 5° |
| Application: | For roughing application in materials up to 55 HRC. Excellent running behaviour also at high projection length. |

| FEEDtec SC | | |
|------------|-----|---|
| ISO | | |
| P | P.1 | ■ |
| | P.2 | ■ |
| | P.3 | ■ |
| | P.4 | ■ |
| | P.5 | ■ |
| K | K.1 | ■ |
| | K.2 | ■ |
| | K.3 | ■ |
| H | H.1 | ■ |
| | H.2 | □ |

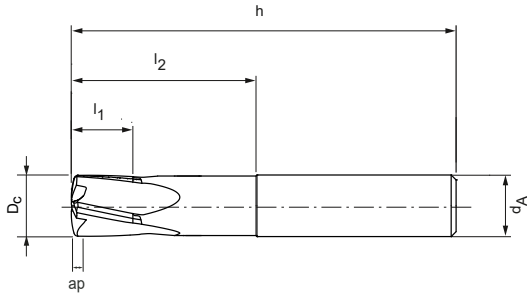
| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|-----|----------------|----------------|------|---|-----------------|
| | | | D _C | d _A | h | l ₁ | l ₂ | ap | | |
| FCU003.003.060 Cr Z4 015 HA | 5164205 | ● | 3,00 | 6,00 | 60 | 3,00 | 15,00 | 0,13 | 4 | HA |
| FCU004.004.060 Cr Z4 020 HA | 5164207 | ● | 4,00 | 6,00 | 60 | 4,00 | 20,00 | 0,17 | 4 | HA |
| FCU005.005.060 Cr Z4 020 HA | 5164209 | ● | 5,00 | 6,00 | 60 | 5,00 | 20,00 | 0,20 | 4 | HA |
| FCU006.006.060 Cr Z4 024 HA | 5164210 | ● | 6,00 | 6,00 | 60 | 6,00 | 24,00 | 0,24 | 4 | HA |
| FCU008.008.064 Cr Z4 032 HA | 5164212 | ● | 8,00 | 8,00 | 64 | 8,00 | 32,00 | 0,31 | 4 | HA |
| FCU010.010.100 Cr Z4 050 HA | 5164213 | ● | 10,00 | 10,00 | 100 | 10,00 | 50,00 | 0,39 | 4 | HA |
| FCU012.012.100 Cr Z4 060 HA | 5164351 | ⦿ | 12,00 | 12,00 | 100 | 12,00 | 60,00 | 0,46 | 4 | HA |

Bestellbeispiel Order example: 1 Stück piece 5164205 oder or FCU003.003.060 Cr Z4 015 HA
Genauere Schnittwertempfehlung siehe Seite 303
Detailed cutting recommendations, see page 303

- Verfügbar ab Lager Available from stock
- ⦿ Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

FEEDtec SC Hardened

Hochvorschubfräser mit Hals Z4/Z6
High feed cutter neck Z4/Z6



| Hard Facts | |
|--------------------|---|
| Fräserdurchmesser: | 2,00 - 12,00 mm |
| Beschichtung: | TiSiN PVD |
| Schneidezah: | Z = 4/6 Z4 ≤ 6 mm, Z6 ≥ 6 mm |
| Drallwinkel: | 12° |
| Anwendung: | Speziell zum Schruppen und Schlichten gehärteter Bauteile mit einer Härte ab 45 HRC, auch im unterbrochenen Schnitt, bis max. 66 HRC. Durch die innovative Stirngeometrie sind beim Schlichten sehr hohe Oberflächengüten realisierbar. |
| Diameter: | 2.00 - 12.00 mm |
| Coating: | TiSiN PVD |
| Amount/Teeth: | Z = 4/6 Z4 ≤ 6 mm, Z6 ≥ 6 mm |
| Helix angle: | 12° |
| Application: | Designed for roughing and semifinishing application on hardened materials shorting from 45 HRC. High performance also in interrupted cuts, due to special geometry. |

| FEEDtec SC | | |
|------------|-----|-------------------------------------|
| ISO | | |
| P | P.1 | <input type="checkbox"/> |
| | P.2 | <input type="checkbox"/> |
| | P.3 | <input type="checkbox"/> |
| | P.4 | <input type="checkbox"/> |
| | P.5 | <input type="checkbox"/> |
| K | K.1 | <input type="checkbox"/> |
| | K.2 | <input type="checkbox"/> |
| | K.3 | <input type="checkbox"/> |
| H | H.1 | <input checked="" type="checkbox"/> |
| | H.2 | <input checked="" type="checkbox"/> |
| | H.3 | <input checked="" type="checkbox"/> |
| | H.4 | <input type="checkbox"/> |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] | | | Dimensions [mm] | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|------------------|----------------|--------|-----------------|----------------|------|---|-----------------|
| | | | D _c | d _a | h | l ₁ | l ₂ | ap | | |
| FCH002.002.060 Cr Z4 006 HA | 5164215 | ● | 2,00 | 6,00 | 60,00 | 2,00 | 6,00 | 0,09 | 4 | HA |
| FCH002.002.060 Cr Z4 010 HA | 5164355 | ○ | 2,00 | 6,00 | 60,00 | 2,00 | 10,00 | 0,09 | 4 | HA |
| FCH003.003.060 Cr Z4 009 HA | 5164216 | ● | 3,00 | 6,00 | 60,00 | 3,00 | 9,00 | 0,13 | 4 | HA |
| FCH003.003.060 Cr Z4 015 HA | 5164357 | ○ | 3,00 | 6,00 | 60,00 | 3,00 | 15,00 | 0,13 | 4 | HA |
| FCH004.004.060 Cr Z4 012 HA | 5164219 | ● | 4,00 | 6,00 | 60,00 | 4,00 | 12,00 | 0,17 | 4 | HA |
| FCH004.004.060 Cr Z4 020 HA | 5164361 | ○ | 4,00 | 6,00 | 60,00 | 4,00 | 20,00 | 0,17 | 4 | HA |
| FCH005.005.060 Cr Z4 015 HA | 5164222 | ● | 5,00 | 6,00 | 60,00 | 5,00 | 15,00 | 0,22 | 4 | HA |
| FCH005.005.060 Cr Z4 020 HA | 5164363 | ○ | 5,00 | 6,00 | 60,00 | 5,00 | 20,00 | 0,22 | 4 | HA |
| FCH006.006.060 Cr Z4 018 HA | 5164225 | ● | 6,00 | 6,00 | 60,00 | 6,00 | 18,00 | 0,26 | 4 | HA |
| FCH006.006.060 Cr Z4 024 HA | 5164364 | ○ | 6,00 | 6,00 | 60,00 | 6,00 | 24,00 | 0,26 | 4 | HA |
| FCH006.006.060 Cr Z6 018 HA | 5164226 | ● | 6,00 | 6,00 | 60,00 | 6,00 | 18,00 | 0,26 | 6 | HA |
| FCH006.006.060 Cr Z6 024 HA | 5164365 | ○ | 6,00 | 6,00 | 60,00 | 6,00 | 24,00 | 0,26 | 6 | HA |
| FCH008.008.064 Cr Z6 024 HA | 5164229 | ● | 8,00 | 8,00 | 64,00 | 8,00 | 24,00 | 0,35 | 6 | HA |
| FCH008.008.064 Cr Z6 032 HA | 5164366 | ○ | 8,00 | 8,00 | 64,00 | 8,00 | 32,00 | 0,35 | 6 | HA |
| FCH008.008.075 Cr Z6 040 HA | 5164368 | ○ | 8,00 | 8,00 | 75,00 | 8,00 | 40,00 | 0,35 | 6 | HA |
| FCH010.010.075 Cr Z6 030 HA | 5164230 | ● | 10,00 | 10,00 | 75,00 | 10,00 | 30,00 | 0,44 | 6 | HA |
| FCH010.010.075 Cr Z6 040 HA | 5164369 | ○ | 10,00 | 10,00 | 75,00 | 10,00 | 40,00 | 0,44 | 6 | HA |
| FCH010.010.100 Cr Z6 050 HA | 5164370 | ○ | 10,00 | 10,00 | 100,00 | 10,00 | 50,00 | 0,44 | 6 | HA |
| FCH012.012.075 Cr Z6 036 HA | 5164231 | ● | 12,00 | 12,00 | 75,00 | 12,00 | 36,00 | 0,52 | 6 | HA |
| FCH012.012.100 Cr Z6 048 HA | 5164371 | ○ | 12,00 | 12,00 | 100,00 | 12,00 | 48,00 | 0,52 | 6 | HA |
| FCH012.012.100 Cr Z6 060 HA | 5164372 | ○ | 12,00 | 12,00 | 100,00 | 12,00 | 60,00 | 0,52 | 6 | HA |

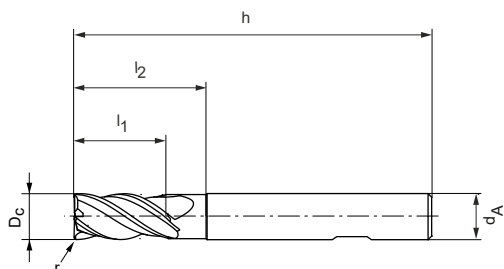
Bestellbeispiel Order example: 1 Stück piece 5164215 oder or FCH002.002.060 Cr Z4 006 HA
Genauere Schnittwertempfehlung siehe Seite 304
Detailed cutting recommendations, see page 304

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

UNItec Pro H long neck FR

Lange Ausführung mit Hals und Eckenradius Z4

Execution long neck with full radius Z4



| Hard Facts | |
|--------------------|------------------|
| Fräserdurchmesser: | 4,00 - 20,00 mm |
| Beschichtung: | TiSiN PVD |
| Schneidenzahl: | Z = 4 |
| Drallwinkel: | 42° |
| Besonderheiten: | Ungleichteilung |
| Diameter: | 4.00 - 20.00 mm |
| Coating: | TiSiN PVD |
| Amount/Teeth: | Z = 4 |
| Helix angle: | 42° |
| Special feature: | Unequal division |

| UNItec Pro H long neck FR | | |
|---------------------------|-----|-------------------------------------|
| ISO | | |
| P | P.1 | <input type="checkbox"/> |
| | P.2 | <input type="checkbox"/> |
| | P.3 | <input type="checkbox"/> |
| | P.4 | <input type="checkbox"/> |
| | P.5 | <input type="checkbox"/> |
| H | H.1 | <input checked="" type="checkbox"/> |
| | H.2 | <input checked="" type="checkbox"/> |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|-------|----------------|----------------|------|---|-----------------|
| | | | D _c | d _A | h | l ₁ | l ₂ | r | | |
| UPH04.011.057 FR0.5 Z4 HB | 5163463 | ● | *4,00 | 6,00 | 57,00 | 11,00 | - | 0,50 | 4 | HB |
| UPH04.011.057 FR1.0 Z4 HB | 5163465 | ● | *4,00 | 6,00 | 57,00 | 11,00 | - | 1,00 | 4 | HB |
| UPH05.013.057 FR0.5 Z4 HB | 5163467 | ○ | *5,00 | 6,00 | 57,00 | 13,00 | - | 0,50 | 4 | HB |
| UPH05.013.057 FR1.0 Z4 HB | 5163468 | ○ | *5,00 | 6,00 | 57,00 | 13,00 | - | 1,00 | 4 | HB |
| UPH06.013.057 FR0.5 Z4 HB | 5163469 | ● | 6,00 | 6,00 | 57,00 | 13,00 | 20,00 | 0,50 | 4 | HB |
| UPH06.013.057 FR1.0 Z4 HB | 5163470 | ● | 6,00 | 6,00 | 57,00 | 13,00 | 20,00 | 1,00 | 4 | HB |
| UPH06.013.057 FR1.5 Z4 HB | 5163471 | ○ | 6,00 | 6,00 | 57,00 | 13,00 | 20,00 | 1,50 | 4 | HB |
| UPH06.013.057 FR2.0 Z4 HB | 5163472 | ● | 6,00 | 6,00 | 57,00 | 13,00 | 20,00 | 2,00 | 4 | HB |
| UPH08.021.063 FR0.5 Z4 HB | 5163473 | ● | 8,00 | 8,00 | 63,00 | 21,00 | 25,00 | 0,50 | 4 | HB |
| UPH08.021.063 FR1.0 Z4 HB | 5163474 | ● | 8,00 | 8,00 | 63,00 | 21,00 | 25,00 | 1,00 | 4 | HB |
| UPH08.021.063 FR1.5 Z4 HB | 5163475 | ○ | 8,00 | 8,00 | 63,00 | 21,00 | 25,00 | 1,50 | 4 | HB |
| UPH08.021.063 FR2.0 Z4 HB | 5163476 | ● | 8,00 | 8,00 | 63,00 | 21,00 | 25,00 | 2,00 | 4 | HB |
| UPH08.021.063 FR2.5 Z4 HB | 5163477 | ○ | 8,00 | 8,00 | 63,00 | 21,00 | 25,00 | 2,50 | 4 | HB |
| UPH08.021.063 FR3.0 Z4 HB | 5163479 | ○ | 8,00 | 8,00 | 63,00 | 21,00 | 25,00 | 3,00 | 4 | HB |

Bestellbeispiel Order example: 1 Stück piece 5163463 oder or UPH04.011.057 FR0.5 Z4 HB

Genauere Schnittwertempfehlung siehe Seite 305

Detailed cutting recommendations, see page 305

* Ausführung ohne Hals

* Ausführung ohne Hals

● Verfügbar ab Lager Available from stock

○ Kurzfristig lieferbar Shortly available

○ Lieferzeit auf Anfrage Delivery time on request

UNitec Pro H long neck FR

Lange Ausführung mit Hals und Eckenradius Z4

Execution long neck with full radius Z4

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|--------|----------------|----------------|------|---|-----------------|
| | | | D _C | d _A | h | l ₁ | l ₂ | r | | |
| UPH10.022.072 FR0.5 Z4 HB | 5163480 | ● | 10,00 | 10,00 | 72,00 | 22,00 | 30,00 | 0,50 | 4 | HB |
| UPH10.022.072 FR1.0 Z4 HB | 5163481 | ● | 10,00 | 10,00 | 72,00 | 22,00 | 30,00 | 1,00 | 4 | HB |
| UPH10.022.072 FR1.5 Z4 HB | 5163483 | ○ | 10,00 | 10,00 | 72,00 | 22,00 | 30,00 | 1,50 | 4 | HB |
| UPH10.022.072 FR2.0 Z4 HB | 5163484 | ● | 10,00 | 10,00 | 72,00 | 22,00 | 30,00 | 2,00 | 4 | HB |
| UPH10.022.072 FR2.5 Z4 HB | 5163489 | ○ | 10,00 | 10,00 | 72,00 | 22,00 | 30,00 | 2,50 | 4 | HB |
| UPH10.022.072 FR3.0 Z4 HB | 5163490 | ○ | 10,00 | 10,00 | 72,00 | 22,00 | 30,00 | 3,00 | 4 | HB |
| UPH12.026.083 FR0.5 Z4 HB | 5163491 | ● | 12,00 | 12,00 | 83,00 | 26,00 | 36,00 | 0,50 | 4 | HB |
| UPH12.026.083 FR1.0 Z4 HB | 5163492 | ● | 12,00 | 12,00 | 83,00 | 26,00 | 36,00 | 1,00 | 4 | HB |
| UPH12.026.083 FR1.5 Z4 HB | 5163493 | ○ | 12,00 | 12,00 | 83,00 | 26,00 | 36,00 | 1,50 | 4 | HB |
| UPH12.026.083 FR2.0 Z4 HB | 5163494 | ● | 12,00 | 12,00 | 83,00 | 26,00 | 36,00 | 2,00 | 4 | HB |
| UPH12.026.083 FR2.5 Z4 HB | 5163498 | ○ | 12,00 | 12,00 | 83,00 | 26,00 | 36,00 | 2,50 | 4 | HB |
| UPH12.026.083 FR3.0 Z4 HB | 5163499 | ○ | 12,00 | 12,00 | 83,00 | 26,00 | 36,00 | 3,00 | 4 | HB |
| UPH12.026.083 FR4.0 Z4 HB | 5163500 | ○ | 12,00 | 12,00 | 83,00 | 26,00 | 36,00 | 4,00 | 4 | HB |
| UPH16.036.092 FR0.5 Z4 HB | 5163501 | ● | 16,00 | 16,00 | 92,00 | 36,00 | 42,00 | 0,50 | 4 | HB |
| UPH16.036.092 FR1.0 Z4 HB | 5163502 | ● | 16,00 | 16,00 | 92,00 | 36,00 | 42,00 | 1,00 | 4 | HB |
| UPH16.036.092 FR2.0 Z4 HB | 5163503 | ● | 16,00 | 16,00 | 92,00 | 36,00 | 42,00 | 2,00 | 4 | HB |
| UPH16.036.092 FR2.5 Z4 HB | 5163504 | ○ | 16,00 | 16,00 | 92,00 | 36,00 | 42,00 | 2,50 | 4 | HB |
| UPH16.036.092 FR3.0 Z4 HB | 5163506 | ○ | 16,00 | 16,00 | 92,00 | 36,00 | 42,00 | 3,00 | 4 | HB |
| UPH16.036.092 FR4.0 Z4 HB | 5163507 | ○ | 16,00 | 16,00 | 92,00 | 36,00 | 42,00 | 4,00 | 4 | HB |
| UPH20.041.104 FR1.0 Z4 HB | 5163508 | ○ | 20,00 | 20,00 | 104,00 | 41,00 | 55,00 | 1,00 | 4 | HB |
| UPH20.041.104 FR2.0 Z4 HB | 5163509 | ○ | 20,00 | 20,00 | 104,00 | 41,00 | 55,00 | 2,00 | 4 | HB |
| UPH20.041.104 FR3.0 Z4 HB | 5163511 | ○ | 20,00 | 20,00 | 104,00 | 41,00 | 55,00 | 3,00 | 4 | HB |
| UPH20.041.104 FR4.0 Z4 HB | 5163514 | ○ | 20,00 | 20,00 | 104,00 | 41,00 | 55,00 | 4,00 | 4 | HB |

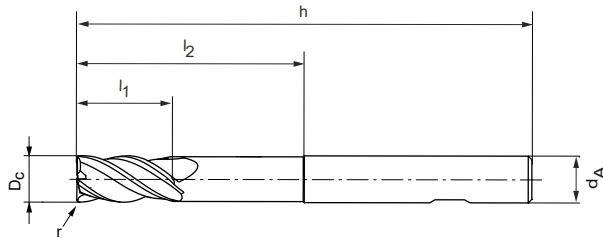
Bestellbeispiel Order example: 1 Stück piece 5163480 oder or UPH10.022.072 FR0.5 Z4 HB
 Genaue Schnitwertempfehlung siehe Seite 305
 Detailed cutting recommendations, see page 305

- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

UNItec Pro H overlength neck FR

Überlange Ausführung mit Hals und Eckenradius Z4

Execution overlength neck with full radius Z4



| Hard Facts | |
|--------------------|------------------|
| Fräserdurchmesser: | 4,00 - 20,00 mm |
| Beschichtung: | TiSiN PVD |
| Schneidenzahl: | Z = 4 |
| Drallwinkel: | 42° |
| Besonderheiten: | Ungleichteilung |
| Diameter: | 4.00 - 20.00 mm |
| Coating: | TiSiN PVD |
| Amount/Teeth: | Z = 4 |
| Helix angle: | 42° |
| Special feature: | Unequal division |

| UNItec Pro H overlength neck FR | | |
|---------------------------------|-----|-------------------------------------|
| ISO | | |
| P | P.1 | <input type="checkbox"/> |
| | P.2 | <input type="checkbox"/> |
| | P.3 | <input type="checkbox"/> |
| | P.4 | <input type="checkbox"/> |
| | P.5 | <input type="checkbox"/> |
| H | H.1 | <input checked="" type="checkbox"/> |
| | H.2 | <input checked="" type="checkbox"/> |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] | | | Dimensions [mm] | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|------------------|----------------|--------|-----------------|----------------|------|---|-----------------|
| | | | D _c | d _A | h | l ₁ | l ₂ | r | | |
| UPH04.011.062 FR0.5 Z4 HB | 5163515 | ● | 4,00 | 6,00 | 62,00 | 11,00 | 22,00 | 0,50 | 4 | HB |
| UPH04.011.062 FR1.0 Z4 HB | 5163518 | ● | 4,00 | 6,00 | 62,00 | 11,00 | 22,00 | 1,00 | 4 | HB |
| UPH05.013.062 FR0.5 Z4 HB | 5163519 | ○ | 5,00 | 6,00 | 62,00 | 13,00 | 24,00 | 0,50 | 4 | HB |
| UPH05.013.062 FR1.0 Z4 HB | 5163520 | ○ | 5,00 | 6,00 | 62,00 | 13,00 | 24,00 | 1,00 | 4 | HB |
| UPH06.013.062 FR0.5 Z4 HB | 5163522 | ● | 6,00 | 6,00 | 62,00 | 13,00 | 25,00 | 0,50 | 4 | HB |
| UPH06.013.062 FR1.0 Z4 HB | 5163524 | ● | 6,00 | 6,00 | 62,00 | 13,00 | 25,00 | 1,00 | 4 | HB |
| UPH06.013.062 FR2.0 Z4 HB | 5163525 | ● | 6,00 | 6,00 | 62,00 | 13,00 | 25,00 | 2,00 | 4 | HB |
| UPH08.021.068 FR1.0 Z4 HB | 5163526 | ● | 8,00 | 8,00 | 68,00 | 21,00 | 30,00 | 1,00 | 4 | HB |
| UPH08.021.068 FR2.0 Z4 HB | 5163528 | ● | 8,00 | 8,00 | 68,00 | 21,00 | 30,00 | 2,00 | 4 | HB |
| UPH10.022.080 FR0.5 Z4 HB | 5163529 | ● | 10,00 | 10,00 | 80,00 | 22,00 | 38,00 | 0,50 | 4 | HB |
| UPH10.022.080 FR1.0 Z4 HB | 5163530 | ● | 10,00 | 10,00 | 80,00 | 22,00 | 38,00 | 1,00 | 4 | HB |
| UPH10.022.080 FR1.5 Z4 HB | 5163531 | ○ | 10,00 | 10,00 | 80,00 | 22,00 | 38,00 | 1,50 | 4 | HB |
| UPH10.022.080 FR2.0 Z4 HB | 5163532 | ● | 10,00 | 10,00 | 80,00 | 22,00 | 38,00 | 2,00 | 4 | HB |
| UPH10.022.080 FR3.0 Z4 HB | 5163533 | ○ | 10,00 | 10,00 | 80,00 | 22,00 | 38,00 | 3,00 | 4 | HB |
| UPH12.026.093 FR0.5 Z4 HB | 5163534 | ● | 12,00 | 12,00 | 93,00 | 26,00 | 46,00 | 0,50 | 4 | HB |
| UPH12.026.093 FR1.0 Z4 HB | 5163535 | ● | 12,00 | 12,00 | 93,00 | 26,00 | 46,00 | 1,00 | 4 | HB |
| UPH12.026.093 FR1.5 Z4 HB | 5163536 | ○ | 12,00 | 12,00 | 93,00 | 26,00 | 46,00 | 1,50 | 4 | HB |
| UPH12.026.093 FR2.0 Z4 HB | 5163537 | ● | 12,00 | 12,00 | 93,00 | 26,00 | 46,00 | 2,00 | 4 | HB |
| UPH12.026.093 FR3.0 Z4 HB | 5163538 | ○ | 12,00 | 12,00 | 93,00 | 26,00 | 46,00 | 3,00 | 4 | HB |
| UPH16.036.108 FR0.5 Z4 HB | 5163539 | ● | 16,00 | 16,00 | 108,00 | 36,00 | 58,00 | 0,50 | 4 | HB |
| UPH16.036.108 FR1.0 Z4 HB | 5163540 | ● | 16,00 | 16,00 | 108,00 | 36,00 | 58,00 | 1,00 | 4 | HB |
| UPH16.036.108 FR2.0 Z4 HB | 5163541 | ● | 16,00 | 16,00 | 108,00 | 36,00 | 58,00 | 2,00 | 4 | HB |
| UPH16.036.108 FR4.0 Z4 HB | 5163542 | ○ | 16,00 | 16,00 | 108,00 | 36,00 | 58,00 | 4,00 | 4 | HB |
| UPH20.041.126 FR1.0 Z4 HB | 5163543 | ○ | 20,00 | 20,00 | 126,00 | 41,00 | 74,00 | 1,00 | 4 | HB |
| UPH20.041.126 FR2.0 Z4 HB | 5163550 | ○ | 20,00 | 20,00 | 126,00 | 41,00 | 74,00 | 2,00 | 4 | HB |
| UPH20.041.126 FR4.0 Z4 HB | 5163549 | ○ | 20,00 | 20,00 | 126,00 | 41,00 | 74,00 | 4,00 | 4 | HB |

Bestellbeispiel Order example: 1 Stück piece 5163515 oder or UPH04.011.062 FR0.5 Z4 HB

Genauere Schnittwertempfehlung siehe Seite 305

Detailed cutting recommendations, see page 305

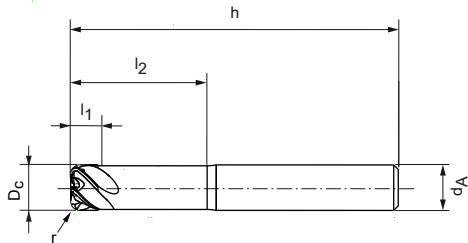
● Verfügbar ab Lager Available from stock

● Kurzfristig lieferbar Shortly available

○ Lieferzeit auf Anfrage Delivery time on request

UNItec Pro H Superfinish FR

Restmaterialfräser Eckenradius und Hals Z5
Restmaterial cutter neck with full radius Z5



| Hard Facts | |
|--------------------|-----------------|
| Fräserdurchmesser: | 4,00 - 12,00 mm |
| Beschichtung: | AlTiSiN PVD |
| Schneidenzahl: | Z = 5 |
| Drallwinkel: | ~ 47° |
| Diameter: | 4.00 - 12.00 mm |
| Coating: | AlTiSiN PVD |
| Amount/Teeth: | Z = 5 |
| Helix angle: | ~ 47° |

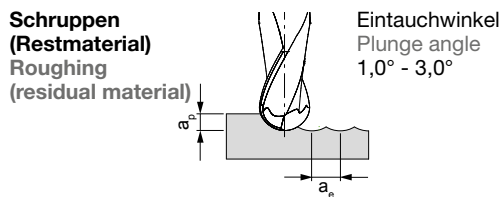
| UNItec Pro H | | |
|--------------|-----|---|
| ISO | | |
| P | P.1 | ■ |
| | P.2 | ■ |
| | P.3 | ■ |
| | P.4 | ■ |
| | P.5 | ■ |
| K | K.1 | ■ |
| | K.2 | ■ |
| | K.3 | ■ |
| H | H.1 | ■ |
| | H.2 | ■ |
| | H.3 | ■ |
| | H.4 | ■ |

| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | | | z | Schaft Shank |
|------------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|--------|----------------|----------------|------|---|-----------------|
| | | | D _C | d _A | h | l ₁ | l ₂ | r | | |
| UPH004.04.2.060 FR0.5 Z5 012 HA SF | 5164514 | ● | 4,00 | 6,00 | 60,00 | 4,20 | 12,00 | 0,50 | 5 | HA |
| UPH004.04.2.060 FR0.5 Z5 020 HA SF | 5164516 | ● | 4,00 | 6,00 | 60,00 | 4,20 | 20,00 | 0,50 | 5 | HA |
| UPH004.04.2.060 FR1.0 Z5 012 HA SF | 5164518 | ● | 4,00 | 6,00 | 60,00 | 4,20 | 12,00 | 1,00 | 5 | HA |
| UPH004.04.2.060 FR1.0 Z5 020 HA SF | 5164519 | ● | 4,00 | 6,00 | 60,00 | 4,20 | 20,00 | 1,00 | 5 | HA |
| UPH005.05.2.060 FR0.5 Z5 015 HA SF | 5164520 | ● | 5,00 | 6,00 | 60,00 | 5,20 | 15,00 | 0,50 | 5 | HA |
| UPH005.05.2.060 FR0.5 Z5 025 HA SF | 5164521 | ● | 5,00 | 6,00 | 60,00 | 5,20 | 25,00 | 0,50 | 5 | HA |
| UPH005.05.2.060 FR1.0 Z5 015 HA SF | 5164522 | ● | 5,00 | 6,00 | 60,00 | 5,20 | 15,00 | 1,00 | 5 | HA |
| UPH005.05.2.060 FR1.0 Z5 025 HA SF | 5164533 | ● | 5,00 | 6,00 | 60,00 | 5,20 | 25,00 | 1,00 | 5 | HA |
| UPH006.06.3.060 FR0.5 Z5 018 HA SF | 5164534 | ● | 6,00 | 6,00 | 60,00 | 6,30 | 18,00 | 0,50 | 5 | HA |
| UPH006.06.3.075 FR0.5 Z5 030 HA SF | 5164536 | ● | 6,00 | 6,00 | 75,00 | 6,30 | 30,00 | 0,50 | 5 | HA |
| UPH006.06.3.060 FR1.0 Z5 018 HA SF | 5164540 | ● | 6,00 | 6,00 | 60,00 | 6,30 | 18,00 | 1,00 | 5 | HA |
| UPH006.06.3.075 FR1.0 Z5 030 HA SF | 5164542 | ● | 6,00 | 6,00 | 75,00 | 6,30 | 30,00 | 1,00 | 5 | HA |
| UPH008.08.4.064 FR0.5 Z5 024 HA SF | 5164544 | ● | 8,00 | 8,00 | 64,00 | 8,40 | 24,00 | 0,50 | 5 | HA |
| UPH008.08.4.075 FR0.5 Z5 040 HA SF | 5164545 | ● | 8,00 | 8,00 | 75,00 | 8,40 | 40,00 | 0,50 | 5 | HA |
| UPH008.08.4.064 FR1.0 Z5 024 HA SF | 5164546 | ● | 8,00 | 8,00 | 64,00 | 8,40 | 24,00 | 1,00 | 5 | HA |
| UPH008.08.4.075 FR1.0 Z5 040 HA SF | 5164547 | ● | 8,00 | 8,00 | 75,00 | 8,40 | 40,00 | 1,00 | 5 | HA |
| UPH010.10.5.075 FR1.0 Z5 030 HA SF | 5164548 | ● | 10,00 | 10,00 | 75,00 | 10,50 | 30,00 | 1,00 | 5 | HA |
| UPH010.10.5.100 FR1.0 Z5 050 HA SF | 5164550 | ● | 10,00 | 10,00 | 100,00 | 10,50 | 50,00 | 1,00 | 5 | HA |
| UPH010.10.5.075 FR2.0 Z5 030 HA SF | 5164552 | ● | 10,00 | 10,00 | 75,00 | 10,50 | 30,00 | 2,00 | 5 | HA |
| UPH010.10.5.100 FR2.0 Z5 050 HA SF | 5164554 | ● | 10,00 | 10,00 | 100,00 | 10,50 | 50,00 | 2,00 | 5 | HA |
| UPH012.12.5.100 FR1.0 Z5 036 HA SF | 5164556 | ● | 12,00 | 12,00 | 100,00 | 12,50 | 36,00 | 1,00 | 5 | HA |
| UPH012.12.5.100 FR1.0 Z5 060 HA SF | 5164558 | ● | 12,00 | 12,00 | 100,00 | 12,50 | 60,00 | 1,00 | 5 | HA |
| UPH012.12.5.100 FR2.0 Z5 036 HA SF | 5164559 | ● | 12,00 | 12,00 | 100,00 | 12,50 | 36,00 | 2,00 | 5 | HA |
| UPH012.12.5.100 FR2.0 Z5 060 HA SF | 5164560 | ● | 12,00 | 12,00 | 100,00 | 12,50 | 60,00 | 2,00 | 5 | HA |

Bestellbeispiel Order example: 1 Stück piece 5164514 oder or UPH004.04.2.060 FR0.5 Z5 012 HA SF
Genauere Schnittwertempfehlung siehe Seite 306
Detailed cutting recommendations, see page 306

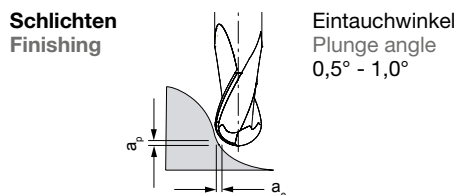
- Verfügbar ab Lager Available from stock
- Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

Schnittwertempfehlung für Eckfräser, Vorschub und Schnittgeschwindigkeit
Recommended cutting values for corner milling cutters, feed and cutting speed



BALLtec SC Universal Z2/Z4

| BZG | Kühlung Cooling | | | a _p [mm] | a _e [mm] | v _c [m/min] | f _z [mm/Zahn] f _z [mm/tooth] | | | | | | | | | | | | | | |
|-----|-----------------|------------------|-----|---------------------|---------------------|------------------------|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | Trocken Dry | Luft/MMS Air/MMS | KSS | | | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | | | | | | | |
| | | | | | | | 0,40 | 0,50 | 0,60 | 0,80 | 1,00 | 1,50 | 1,80 | 2,00 | 2,50 | 3,00 | 4,00 | 5,00 | 6,00 | 8,00 | 10,00 |
| P | P1 | ● | ● | ● | 0,05xD < 0,25xD | 240 - 300 | 0,008 | 0,010 | 0,012 | 0,016 | 0,020 | 0,028 | 0,035 | 0,040 | 0,050 | 0,061 | 0,084 | 0,107 | 0,125 | 0,165 | 0,200 |
| | P2 | ● | ● | ● | 0,05xD < 0,25xD | 240 - 300 | 0,008 | 0,010 | 0,012 | 0,016 | 0,020 | 0,028 | 0,035 | 0,040 | 0,050 | 0,061 | 0,084 | 0,107 | 0,125 | 0,165 | 0,200 |
| | P3 | ● | ● | ● | 0,05xD < 0,25xD | 220 - 300 | 0,008 | 0,010 | 0,011 | 0,015 | 0,019 | 0,027 | 0,033 | 0,038 | 0,048 | 0,058 | 0,080 | 0,102 | 0,119 | 0,157 | 0,190 |
| | P4 | | ● | ● | 0,05xD < 0,25xD | 240 - 280 | 0,008 | 0,010 | 0,012 | 0,016 | 0,020 | 0,028 | 0,035 | 0,040 | 0,050 | 0,061 | 0,084 | 0,107 | 0,125 | 0,165 | 0,200 |
| | P5 | | ● | ● | 0,05xD < 0,25xD | 200 - 280 | 0,007 | 0,009 | 0,011 | 0,014 | 0,018 | 0,025 | 0,031 | 0,035 | 0,044 | 0,054 | 0,074 | 0,094 | 0,110 | 0,145 | 0,176 |
| M | M1 | | | ● | 0,05xD < 0,25xD | 85 - 110 | 0,007 | 0,009 | 0,011 | 0,014 | 0,018 | 0,025 | 0,031 | 0,035 | 0,044 | 0,054 | 0,074 | 0,094 | 0,110 | 0,145 | 0,176 |
| | M2 | | | ● | 0,05xD < 0,25xD | 60 - 85 | 0,006 | 0,007 | 0,009 | 0,012 | 0,015 | 0,020 | 0,026 | 0,029 | 0,037 | 0,045 | 0,061 | 0,078 | 0,091 | 0,120 | 0,146 |
| K | K1 | ● | ● | ● | 0,06xD < 0,3xD | 250 - 300 | 0,010 | 0,012 | 0,014 | 0,019 | 0,024 | 0,034 | 0,042 | 0,048 | 0,060 | 0,073 | 0,101 | 0,128 | 0,150 | 0,198 | 0,240 |
| | K2 | ● | ● | ● | 0,06xD < 0,3xD | 240 - 300 | 0,008 | 0,010 | 0,012 | 0,016 | 0,020 | 0,028 | 0,035 | 0,040 | 0,050 | 0,061 | 0,084 | 0,107 | 0,125 | 0,165 | 0,200 |
| | K3 | ● | ● | ● | 0,06xD < 0,3xD | 240 - 300 | 0,006 | 0,007 | 0,009 | 0,012 | 0,015 | 0,020 | 0,026 | 0,029 | 0,037 | 0,045 | 0,061 | 0,078 | 0,091 | 0,120 | 0,146 |
| H | H1 | ● | ● | | 0,04xD < 0,18xD | 160 - 280 | 0,006 | 0,007 | 0,009 | 0,012 | 0,015 | 0,020 | 0,026 | 0,029 | 0,037 | 0,045 | 0,061 | 0,078 | 0,091 | 0,120 | 0,146 |
| | H2 | | ● | | 0,015xD < 0,03xD | 100 - 160 | 0,003 | 0,004 | 0,005 | 0,006 | 0,008 | 0,011 | 0,014 | 0,016 | 0,020 | 0,024 | 0,034 | 0,043 | 0,050 | 0,066 | 0,080 |

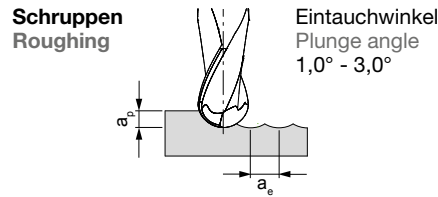


BALLtec SC Universal Z2/Z4

| BZG | Kühlung Cooling | | | a _p [mm] | a _e [mm] | v _c [m/min] | f _z [mm/Zahn] f _z [mm/tooth] | | | | | | | | | | | | | | | |
|-----|-----------------|------------------|-----|---------------------|---------------------|------------------------|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | Trocken Dry | Luft/MMS Air/MMS | KSS | | | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | | | | | | | | |
| | | | | | | | 0,40 | 0,50 | 0,60 | 0,80 | 1,00 | 1,50 | 1,80 | 2,00 | 2,50 | 3,00 | 4,00 | 5,00 | 6,00 | 8,00 | 10,00 | |
| P | P1 | ● | ● | ● | 0,015xD | 0,025xD | 280 - 340 | 0,008 | 0,010 | 0,011 | 0,015 | 0,019 | 0,027 | 0,033 | 0,038 | 0,048 | 0,058 | 0,080 | 0,102 | 0,119 | 0,157 | 0,190 |
| | P2 | ● | ● | ● | 0,014xD | 0,024xD | 260 - 320 | 0,008 | 0,010 | 0,011 | 0,015 | 0,019 | 0,027 | 0,033 | 0,038 | 0,048 | 0,058 | 0,080 | 0,102 | 0,119 | 0,157 | 0,190 |
| | P3 | ● | ● | ● | 0,013xD | 0,023xD | 240 - 320 | 0,007 | 0,009 | 0,011 | 0,014 | 0,018 | 0,025 | 0,032 | 0,036 | 0,045 | 0,055 | 0,076 | 0,097 | 0,113 | 0,149 | 0,181 |
| | P4 | | ● | ● | 0,013xD | 0,023xD | 260 - 300 | 0,008 | 0,010 | 0,011 | 0,015 | 0,019 | 0,027 | 0,033 | 0,038 | 0,048 | 0,058 | 0,080 | 0,102 | 0,119 | 0,157 | 0,190 |
| | P5 | | ● | ● | 0,013xD | 0,023xD | 220 - 300 | 0,007 | 0,008 | 0,010 | 0,013 | 0,017 | 0,023 | 0,029 | 0,033 | 0,042 | 0,051 | 0,070 | 0,089 | 0,105 | 0,138 | 0,167 |
| M | M1 | | | ● | 0,013xD | 0,023xD | 90 - 120 | 0,007 | 0,008 | 0,010 | 0,013 | 0,017 | 0,023 | 0,029 | 0,033 | 0,042 | 0,051 | 0,070 | 0,089 | 0,105 | 0,138 | 0,167 |
| | | ● | ● | ● | 0,012xD | 0,022xD | 70 - 90 | 0,006 | 0,007 | 0,008 | 0,011 | 0,014 | 0,019 | 0,024 | 0,028 | 0,035 | 0,042 | 0,058 | 0,074 | 0,087 | 0,114 | 0,139 |
| K | K1 | ● | ● | ● | 0,015xD | 0,025xD | 280-340 | 0,008 | 0,010 | 0,011 | 0,015 | 0,019 | 0,027 | 0,033 | 0,038 | 0,048 | 0,058 | 0,080 | 0,102 | 0,119 | 0,157 | 0,190 |
| | K2 | ● | ● | ● | 0,014xD | 0,024xD | 260 - 320 | 0,007 | 0,008 | 0,010 | 0,013 | 0,017 | 0,023 | 0,029 | 0,033 | 0,042 | 0,051 | 0,070 | 0,089 | 0,105 | 0,138 | 0,167 |
| | K3 | ● | ● | ● | 0,014xD | 0,024xD | 260 - 320 | 0,006 | 0,007 | 0,008 | 0,011 | 0,014 | 0,019 | 0,024 | 0,028 | 0,035 | 0,042 | 0,058 | 0,074 | 0,087 | 0,114 | 0,139 |
| H | H1 | ● | ● | | 0,012xD | 0,022xD | 160 - 280 | 0,006 | 0,007 | 0,009 | 0,012 | 0,014 | 0,020 | 0,025 | 0,029 | 0,036 | 0,044 | 0,061 | 0,077 | 0,090 | 0,119 | 0,144 |
| | H2 | | ● | | 0,008xD | 0,018xD | 120 - 160 | 0,004 | 0,005 | 0,006 | 0,008 | 0,010 | 0,013 | 0,017 | 0,019 | 0,024 | 0,029 | 0,040 | 0,051 | 0,060 | 0,079 | 0,096 |

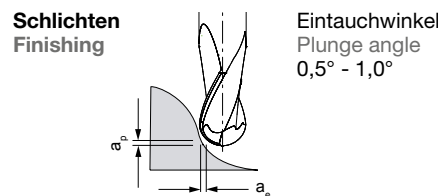
* Angegebene Schnittdaten sind als Richtwert zu sehen, welche durch Versuche für jeden Anwendungsfall separat optimiert werden.
* Recommended cutting data has to be seen as a reference which can be optimised for each application through trials separately

Schnittwertempfehlung für Eckfräser, Vorschub und Schnittgeschwindigkeit
Recommended cutting values for corner milling cutters, feed and cutting speed



BALLtec SC Hardened Z2/Z4

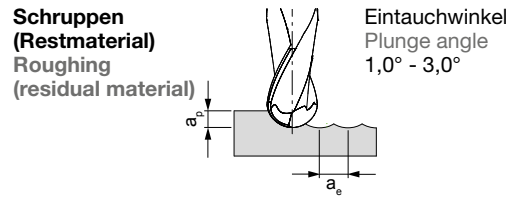
| BZG | Kühlung Cooling | | | a _p [mm] | a _e [mm] | v _c [m/min] | f _z [mm/Zahn] f _z [mm/tooth] | | | | | | | | | | | | | |
|-----|-----------------|---------------------|-----|------------------------|------------------------|---------------------------|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | Trocken Dry | Luft/MMS Air/MMS | KSS | | | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | | | | | | |
| | | | | | | | 0,40 | 0,50 | 0,60 | 0,80 | 1,00 | 1,50 | 1,80 | 2,00 | 2,50 | 3,00 | 4,00 | 5,00 | 6,00 | |
| P | P1 | ● | ● | ● | 0,05xD | < 0,25xD | 250 - 300 | 0,008 | 0,010 | 0,012 | 0,016 | 0,020 | 0,028 | 0,035 | 0,040 | 0,050 | 0,061 | 0,084 | 0,107 | 0,125 |
| | | ● | ● | ● | 0,045xD | < 0,25xD | 240 - 280 | 0,007 | 0,009 | 0,011 | 0,014 | 0,018 | 0,025 | 0,031 | 0,035 | 0,044 | 0,054 | 0,074 | 0,094 | 0,110 |
| | P2 | ● | ● | ● | 0,05xD | < 0,25xD | 250 - 300 | 0,008 | 0,010 | 0,012 | 0,016 | 0,020 | 0,028 | 0,035 | 0,040 | 0,050 | 0,061 | 0,084 | 0,107 | 0,125 |
| | | ● | ● | ● | 0,045xD | < 0,25xD | 240 - 280 | 0,007 | 0,009 | 0,011 | 0,014 | 0,018 | 0,025 | 0,031 | 0,035 | 0,044 | 0,054 | 0,074 | 0,094 | 0,110 |
| | P3 | ● | ● | ● | 0,05xD | < 0,25xD | 250 - 300 | 0,008 | 0,010 | 0,011 | 0,015 | 0,019 | 0,027 | 0,033 | 0,038 | 0,048 | 0,058 | 0,080 | 0,102 | 0,119 |
| | | ● | ● | ● | 0,045xD | < 0,2xD | 240 - 280 | 0,007 | 0,009 | 0,011 | 0,014 | 0,018 | 0,025 | 0,031 | 0,035 | 0,044 | 0,054 | 0,074 | 0,094 | 0,110 |
| K | K1 | ● | ● | ● | 0,06xD | < 0,3xD | 250 - 300 | 0,010 | 0,012 | 0,014 | 0,019 | 0,024 | 0,034 | 0,042 | 0,048 | 0,060 | 0,073 | 0,101 | 0,128 | 0,150 |
| | | ● | ● | ● | 0,06xD | < 0,3xD | 250 - 300 | 0,008 | 0,010 | 0,012 | 0,016 | 0,020 | 0,028 | 0,035 | 0,040 | 0,050 | 0,061 | 0,084 | 0,107 | 0,125 |
| | K2 | ● | ● | ● | 0,06xD | < 0,3xD | 240 - 280 | 0,008 | 0,010 | 0,012 | 0,016 | 0,020 | 0,028 | 0,035 | 0,040 | 0,050 | 0,061 | 0,084 | 0,107 | 0,125 |
| | | ● | ● | ● | 0,06xD | < 0,3xD | 240 - 280 | 0,007 | 0,009 | 0,011 | 0,014 | 0,018 | 0,025 | 0,031 | 0,035 | 0,044 | 0,054 | 0,074 | 0,094 | 0,110 |
| H | H1 | ● | ● | ● | 0,04xD | < 0,18xD | 220 - 280 | 0,006 | 0,007 | 0,009 | 0,012 | 0,015 | 0,020 | 0,026 | 0,029 | 0,037 | 0,045 | 0,061 | 0,078 | 0,091 |
| | | ● | ● | ● | 0,03xD | < 0,12xD | 160 - 220 | 0,005 | 0,006 | 0,007 | 0,010 | 0,012 | 0,017 | 0,021 | 0,024 | 0,030 | 0,037 | 0,050 | 0,064 | 0,075 |
| H | H2 | ● | ● | ● | 0,015xD | < 0,03xD | 100 - 160 | 0,003 | 0,004 | 0,005 | 0,006 | 0,008 | 0,011 | 0,014 | 0,016 | 0,020 | 0,024 | 0,034 | 0,043 | 0,050 |
| | | ● | ● | ● | 0,008xD | < 0,018xD | 60 - 100 | 0,002 | 0,003 | 0,004 | 0,005 | 0,006 | 0,008 | 0,011 | 0,012 | 0,015 | 0,018 | 0,025 | 0,032 | 0,038 |
| | H3 | ● | ● | ● | 0,005xD | < 0,015xD | 40 - 80 | 0,002 | 0,002 | 0,003 | 0,004 | 0,004 | 0,006 | 0,008 | 0,009 | 0,011 | 0,013 | 0,019 | 0,024 | 0,028 |



BALLtec SC Hardened Z2/Z4

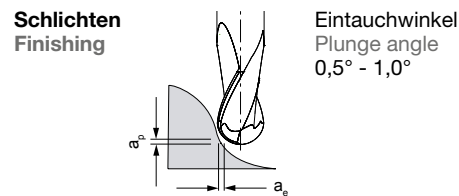
| BZG | Kühlung Cooling | | | a _p [mm] | a _e [mm] | v _c [m/min] | f _z [mm/Zahn] f _z [mm/tooth] | | | | | | | | | | | | | | | |
|-----|-----------------|-------------------------|-----|------------------------|------------------------|---------------------------|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | Trocken Dry | Luft/ MMS Air/MMS | KSS | | | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | | | | | | | | |
| | | | | | | | 0,40 | 0,50 | 0,60 | 0,80 | 1,00 | 1,50 | 1,80 | 2,00 | 2,50 | 3,00 | 4,00 | 5,00 | 6,00 | 8,00 | 10,00 | |
| P | P1 | ● | ● | ● | 0,015xD | 0,025xD | 280 - 340 | 0,008 | 0,010 | 0,011 | 0,015 | 0,019 | 0,027 | 0,033 | 0,038 | 0,048 | 0,058 | 0,080 | 0,102 | 0,119 | 0,157 | 0,190 |
| | P2 | ● | ● | ● | 0,014xD | 0,024xD | 260 - 320 | 0,008 | 0,010 | 0,011 | 0,015 | 0,019 | 0,027 | 0,033 | 0,038 | 0,048 | 0,058 | 0,080 | 0,102 | 0,119 | 0,157 | 0,190 |
| | P3 | ● | ● | ● | 0,013xD | 0,023xD | 240 - 320 | 0,007 | 0,009 | 0,011 | 0,014 | 0,018 | 0,025 | 0,032 | 0,036 | 0,045 | 0,055 | 0,076 | 0,097 | 0,113 | 0,149 | 0,181 |
| | P4 | ● | ● | ● | 0,013xD | 0,023xD | 260 - 300 | 0,008 | 0,010 | 0,011 | 0,015 | 0,019 | 0,027 | 0,033 | 0,038 | 0,048 | 0,058 | 0,080 | 0,102 | 0,119 | 0,157 | 0,190 |
| | P5 | ● | ● | ● | 0,013xD | 0,023xD | 220 - 300 | 0,007 | 0,008 | 0,010 | 0,013 | 0,017 | 0,023 | 0,029 | 0,033 | 0,042 | 0,051 | 0,070 | 0,089 | 0,105 | 0,138 | 0,167 |
| K | K1 | ● | ● | ● | 0,015xD | 0,025xD | 280 - 340 | 0,008 | 0,010 | 0,011 | 0,015 | 0,019 | 0,027 | 0,033 | 0,038 | 0,048 | 0,058 | 0,080 | 0,102 | 0,119 | 0,157 | 0,190 |
| | K2 | ● | ● | ● | 0,014xD | 0,024xD | 260 - 320 | 0,007 | 0,008 | 0,010 | 0,013 | 0,017 | 0,023 | 0,029 | 0,033 | 0,042 | 0,051 | 0,070 | 0,089 | 0,105 | 0,138 | 0,167 |
| | K3 | ● | ● | ● | 0,014xD | 0,024xD | 260 - 320 | 0,006 | 0,007 | 0,008 | 0,011 | 0,014 | 0,019 | 0,024 | 0,028 | 0,035 | 0,042 | 0,058 | 0,074 | 0,087 | 0,114 | 0,139 |
| H | H1 | ● | ● | ● | 0,012xD | 0,022xD | 200 - 300 | 0,007 | 0,009 | 0,011 | 0,015 | 0,018 | 0,026 | 0,032 | 0,037 | 0,046 | 0,056 | 0,077 | 0,098 | 0,114 | 0,151 | 0,183 |
| | H2 | ● | ● | ● | 0,008xD | 0,018xD | 130 - 200 | 0,006 | 0,008 | 0,009 | 0,012 | 0,015 | 0,021 | 0,026 | 0,030 | 0,038 | 0,046 | 0,063 | 0,081 | 0,094 | 0,124 | 0,151 |
| | H3 | ● | ● | ● | 0,006xD | 0,016xD | 70 - 150 | 0,005 | 0,007 | 0,008 | 0,011 | 0,014 | 0,019 | 0,024 | 0,027 | 0,034 | 0,042 | 0,058 | 0,073 | 0,086 | 0,113 | 0,137 |
| | H4 | ● | ● | ● | 0,008xD | 0,018xD | 130 - 200 | 0,006 | 0,008 | 0,009 | 0,012 | 0,015 | 0,021 | 0,026 | 0,030 | 0,038 | 0,046 | 0,063 | 0,081 | 0,094 | 0,124 | 0,151 |

Schnittwertempfehlung für Eckfräser, Vorschub und Schnittgeschwindigkeit
Recommended cutting values for corner milling cutters, feed and cutting speed



BALLtec SC N Z2

| BZG | Kühlung Cooling | | | a_p [mm] | a_e [mm] | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | | | | | | | |
|----------|-----------------|------------------|-----|------------|------------|---------------|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | Trocken Dry | Luft/MMS Air/MMS | KSS | | | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | | | | | |
| | | | | | | | 1,00 | 1,50 | 2,00 | 2,50 | 3,00 | 4,00 | 5,00 | 6,00 | 8,00 | 10,00 | 12,00 | 16,00 | 20,00 |
| M | M1 | | ● | 0,05xD | < 0,25xD | 85 - 110 | 0,018 | 0,025 | 0,035 | 0,044 | 0,054 | 0,074 | 0,094 | 0,110 | 0,145 | 0,176 | 0,207 | 0,264 | 0,304 |
| | M2 | | ● | 0,05xD | < 0,25xD | 60 - 85 | 0,015 | 0,020 | 0,029 | 0,037 | 0,045 | 0,061 | 0,078 | 0,091 | 0,120 | 0,146 | 0,172 | 0,219 | 0,252 |
| | N1 | | ● | 0,1xD | < 0,3xD | 400 - 600 | 0,022 | 0,030 | 0,038 | 0,045 | 0,057 | 0,062 | 0,082 | 0,090 | 0,102 | 0,120 | 0,155 | 0,180 | 0,205 |
| N | N2 | | ● | 0,1xD | < 0,3xD | 300 - 580 | 0,024 | 0,033 | 0,042 | 0,050 | 0,063 | 0,068 | 0,090 | 0,099 | 0,112 | 0,132 | 0,171 | 0,198 | 0,226 |
| | N3 | ● | ● | ● | 0,1xD | < 0,3xD | 300 - 500 | 0,022 | 0,030 | 0,038 | 0,045 | 0,057 | 0,062 | 0,082 | 0,090 | 0,102 | 0,120 | 0,155 | 0,180 |

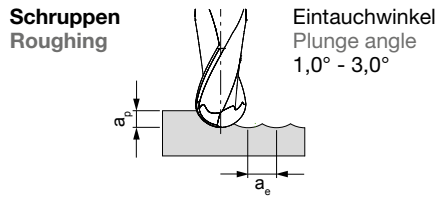


BALLtec SC N Z2

| BZG | Kühlung Cooling | | | a_p [mm] | a_e [mm] | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | | | | | | | |
|----------|-----------------|------------------|-----|------------|------------|---------------|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | Trocken Dry | Luft/MMS Air/MMS | KSS | | | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | | | | | |
| | | | | | | | 1,00 | 1,50 | 2,00 | 2,50 | 3,00 | 4,00 | 5,00 | 6,00 | 8,00 | 10,00 | 12,00 | 16,00 | 20,00 |
| M | M1 | | ● | 0,013xD | 0,023xD | 90 - 120 | 0,017 | 0,023 | 0,033 | 0,042 | 0,051 | 0,070 | 0,089 | 0,105 | 0,138 | 0,167 | 0,196 | 0,251 | 0,288 |
| | M2 | | ● | 0,012xD | 0,022xD | 70 - 90 | 0,014 | 0,019 | 0,028 | 0,035 | 0,042 | 0,058 | 0,074 | 0,087 | 0,114 | 0,139 | 0,163 | 0,208 | 0,239 |
| | N1 | | ● | 0,015xD | 0,025xD | 400 - 600 | 0,022 | 0,030 | 0,038 | 0,045 | 0,057 | 0,062 | 0,082 | 0,090 | 0,102 | 0,120 | 0,155 | 0,180 | 0,205 |
| N | N2 | | ● | 0,015xD | 0,025xD | 300 - 580 | 0,024 | 0,033 | 0,042 | 0,050 | 0,063 | 0,068 | 0,090 | 0,099 | 0,112 | 0,132 | 0,171 | 0,198 | 0,226 |
| | N3 | ● | ● | ● | 0,015xD | 0,025xD | 300 - 500 | 0,022 | 0,030 | 0,038 | 0,045 | 0,057 | 0,062 | 0,082 | 0,090 | 0,102 | 0,120 | 0,155 | 0,180 |

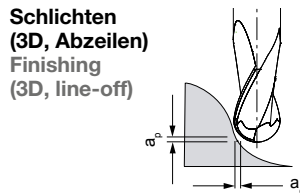
* Angegebene Schnittdaten sind als Richtwert zu sehen, welche durch Versuche für jeden Anwendungsfall separat optimiert werden.
* Recommended cutting data has to be seen as a reference which can be optimised for each application through trials separately

Schnittwertempfehlung für Eckfräser, Vorschub und Schnittgeschwindigkeit
Recommended cutting values for corner milling cutters, feed and cutting speed



BALLtec SC Graphite Z2

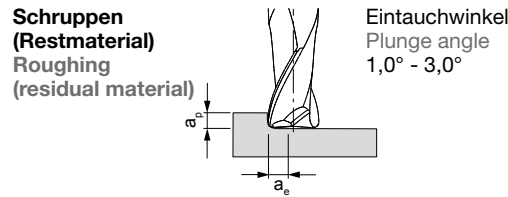
| BZG | Kühlung Cooling | | | a _p [mm] | a _e [mm] | v _c [m/min] | f _z [mm/Zahn] f _z [mm/tooth] | | | | | | | | | | | | | |
|------|-----------------|---------------------|-----|------------------------|------------------------|---------------------------|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | Trocken Dry | Luft/MMS Air/MMS | KSS | | | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | | | | | | |
| | | | | | | | 0,40 | 0,50 | 0,60 | 0,80 | 1,00 | 1,20 | 1,50 | 2,00 | 3,00 | 4,00 | 5,00 | 6,00 | 8,00 | 10,00 |
| N N4 | ● | ● | ● | 0,2xD | 0,3xD | 400 - 600 | 0,016 | 0,018 | 0,019 | 0,020 | 0,022 | 0,030 | 0,038 | 0,045 | 0,057 | 0,062 | 0,082 | 0,090 | 0,102 | 0,120 |



BALLtec SC Graphite Z2

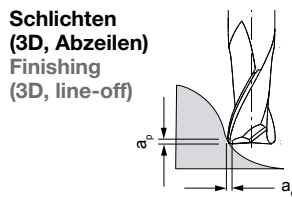
| BZG | Kühlung Cooling | | | a _p [mm] | a _e [mm] | v _c [m/min] | f _z [mm/Zahn] f _z [mm/tooth] | | | | | | | | | | | | | |
|------|-----------------|---------------------|-----|------------------------|------------------------|---------------------------|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | Trocken Dry | Luft/MMS Air/MMS | KSS | | | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | | | | | | |
| | | | | | | | 0,40 | 0,50 | 0,60 | 0,80 | 1,00 | 1,20 | 1,50 | 2,00 | 3,00 | 4,00 | 5,00 | 6,00 | 8,00 | 10,00 |
| N N4 | ● | ● | ● | 0,015xD | 0,025xD | 600 - 800 | 0,016 | 0,018 | 0,019 | 0,020 | 0,022 | 0,030 | 0,038 | 0,045 | 0,057 | 0,062 | 0,082 | 0,090 | 0,102 | 0,120 |

Schnittwertempfehlung für Eckfräser, Vorschub und Schnittgeschwindigkeit
Recommended cutting values for corner milling cutters, feed and cutting speed



TORROtec SC Universal Z2

| BZG | Kühlung Cooling | | | a _p [mm] | a _e [mm] | v _c [m/min] | f _z [mm/Zahn] f _z [mm/tooth] | | | | | | | | | | | | |
|-----|-----------------|------------------|-----|------------------------|------------------------|---------------------------|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | Trocken Dry | Luft/MMS Air/MMS | KSS | | | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | | | | | |
| | | | | | | | 0,40 | 0,50 | 0,60 | 0,80 | 1,00 | 1,50 | 1,80 | 2,00 | 2,50 | 3,00 | 4,00 | 5,00 | 6,00 |
| P1 | ● | ● | ● | 0,15xD | 0,45xD | 240 - 300 | 0,008 | 0,010 | 0,012 | 0,016 | 0,020 | 0,028 | 0,035 | 0,040 | 0,050 | 0,061 | 0,084 | 0,107 | 0,125 |
| P2 | ● | ● | ● | 0,15xD | 0,45xD | 240 - 300 | 0,008 | 0,010 | 0,012 | 0,016 | 0,020 | 0,028 | 0,035 | 0,040 | 0,050 | 0,061 | 0,084 | 0,107 | 0,125 |
| P3 | ● | ● | ● | 0,15xD | 0,45xD | 220 - 300 | 0,008 | 0,010 | 0,011 | 0,015 | 0,019 | 0,027 | 0,033 | 0,038 | 0,048 | 0,058 | 0,080 | 0,102 | 0,119 |
| P4 | | ● | ● | 0,15xD | 0,45xD | 240-280 | 0,008 | 0,010 | 0,012 | 0,016 | 0,020 | 0,028 | 0,035 | 0,040 | 0,050 | 0,061 | 0,084 | 0,107 | 0,125 |
| P5 | | ● | ● | 0,15xD | 0,45xD | 200 - 280 | 0,007 | 0,009 | 0,011 | 0,014 | 0,018 | 0,025 | 0,031 | 0,035 | 0,044 | 0,054 | 0,074 | 0,094 | 0,110 |
| M1 | | | ● | 0,1xD | 0,4xD | 85 - 110 | 0,007 | 0,009 | 0,011 | 0,014 | 0,018 | 0,025 | 0,031 | 0,035 | 0,044 | 0,054 | 0,074 | 0,094 | 0,110 |
| M2 | | | ● | 0,1xD | 0,4xD | 60 - 85 | 0,006 | 0,007 | 0,009 | 0,012 | 0,015 | 0,020 | 0,026 | 0,029 | 0,037 | 0,045 | 0,061 | 0,078 | 0,091 |
| K1 | ● | ● | ● | 0,15xD | 0,55xD | 250 - 300 | 0,010 | 0,012 | 0,014 | 0,019 | 0,024 | 0,034 | 0,042 | 0,048 | 0,060 | 0,073 | 0,101 | 0,128 | 0,150 |
| K2 | ● | ● | ● | 0,15xD | 0,55xD | 240 - 300 | 0,008 | 0,010 | 0,012 | 0,016 | 0,020 | 0,028 | 0,035 | 0,040 | 0,050 | 0,061 | 0,084 | 0,107 | 0,125 |
| K3 | ● | ● | ● | 0,15xD | 0,55xD | 240 - 300 | 0,006 | 0,007 | 0,009 | 0,012 | 0,015 | 0,020 | 0,026 | 0,029 | 0,037 | 0,045 | 0,061 | 0,078 | 0,091 |
| H1 | ● | ● | | 0,06xD | 0,35xD | 140 - 240 | 0,006 | 0,007 | 0,009 | 0,012 | 0,015 | 0,020 | 0,026 | 0,029 | 0,037 | 0,045 | 0,061 | 0,078 | 0,091 |
| H2 | | ● | | 0,025xD | 0,25xD | 100 - 140 | 0,003 | 0,004 | 0,005 | 0,006 | 0,008 | 0,011 | 0,014 | 0,016 | 0,020 | 0,024 | 0,034 | 0,043 | 0,050 |

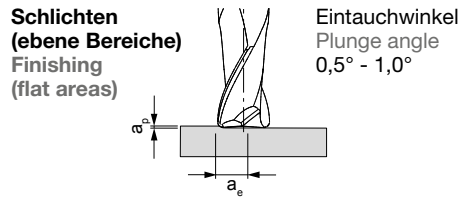


TORROtec SC Universal Z2

| BZG | Kühlung Cooling | | | a _p [mm] | a _e [mm] | v _c [m/min] | f _z [mm/Zahn] f _z [mm/tooth] | | | | | | | | | | | | |
|-----|-----------------|------------------|-----|------------------------|------------------------|---------------------------|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | Trocken Dry | Luft/MMS Air/MMS | KSS | | | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | | | | | |
| | | | | | | | 0,40 | 0,50 | 0,60 | 0,80 | 1,00 | 1,50 | 1,80 | 2,00 | 2,50 | 3,00 | 4,00 | 5,00 | 6,00 |
| P1 | ● | ● | ● | 0,012xD | 0,022xD | 280 - 340 | 0,008 | 0,010 | 0,011 | 0,015 | 0,019 | 0,027 | 0,033 | 0,038 | 0,048 | 0,058 | 0,080 | 0,102 | 0,119 |
| P2 | ● | ● | ● | 0,012xD | 0,022xD | 260 - 320 | 0,008 | 0,010 | 0,011 | 0,015 | 0,019 | 0,027 | 0,033 | 0,038 | 0,048 | 0,058 | 0,080 | 0,102 | 0,119 |
| P3 | ● | ● | ● | 0,012xD | 0,022xD | 240 - 320 | 0,007 | 0,009 | 0,011 | 0,014 | 0,018 | 0,025 | 0,032 | 0,036 | 0,045 | 0,055 | 0,076 | 0,097 | 0,113 |
| P4 | | ● | ● | 0,012xD | 0,022xD | 260 - 300 | 0,008 | 0,010 | 0,011 | 0,015 | 0,019 | 0,027 | 0,033 | 0,038 | 0,048 | 0,058 | 0,080 | 0,102 | 0,119 |
| P5 | | ● | ● | 0,012xD | 0,022xD | 220 - 300 | 0,007 | 0,008 | 0,010 | 0,013 | 0,017 | 0,023 | 0,029 | 0,033 | 0,042 | 0,051 | 0,070 | 0,089 | 0,105 |
| M1 | | | ● | 0,013xD | 0,023xD | 90 - 120 | 0,007 | 0,008 | 0,010 | 0,013 | 0,017 | 0,023 | 0,029 | 0,033 | 0,042 | 0,051 | 0,070 | 0,089 | 0,105 |
| M2 | | | ● | 0,012xD | 0,022xD | 70 - 90 | 0,006 | 0,007 | 0,008 | 0,011 | 0,014 | 0,019 | 0,024 | 0,028 | 0,035 | 0,042 | 0,058 | 0,074 | 0,087 |
| K1 | ● | ● | ● | 0,012xD | 0,022xD | 280 - 340 | 0,008 | 0,010 | 0,011 | 0,015 | 0,019 | 0,027 | 0,033 | 0,038 | 0,048 | 0,058 | 0,080 | 0,102 | 0,119 |
| K2 | ● | ● | ● | 0,012xD | 0,022xD | 260 - 320 | 0,007 | 0,008 | 0,010 | 0,013 | 0,017 | 0,023 | 0,029 | 0,033 | 0,042 | 0,051 | 0,070 | 0,089 | 0,105 |
| K3 | ● | ● | ● | 0,012xD | 0,022xD | 260 - 320 | 0,006 | 0,007 | 0,008 | 0,011 | 0,014 | 0,019 | 0,024 | 0,028 | 0,035 | 0,042 | 0,058 | 0,074 | 0,087 |
| H1 | ● | ● | | 0,012xD | 0,022xD | 170 - 250 | 0,006 | 0,007 | 0,009 | 0,012 | 0,014 | 0,020 | 0,025 | 0,029 | 0,036 | 0,044 | 0,061 | 0,077 | 0,090 |
| H2 | | ● | | 0,01xD | 0,02xD | 120 - 170 | 0,004 | 0,005 | 0,006 | 0,008 | 0,010 | 0,013 | 0,017 | 0,019 | 0,024 | 0,029 | 0,040 | 0,051 | 0,060 |

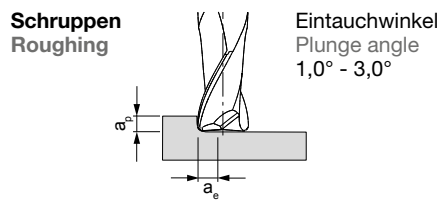
* Angegebene Schnittdaten sind als Richtwert zu sehen, welche durch Versuche für jeden Anwendungsfall separat optimiert werden.
* Recommended cutting data has to be seen as a reference which can be optimised for each application through trials separately

Schnittwertempfehlung für Eckfräser, Vorschub und Schnittgeschwindigkeit
Recommended cutting values for corner milling cutters, feed and cutting speed



TORROtec SC Universal Z2

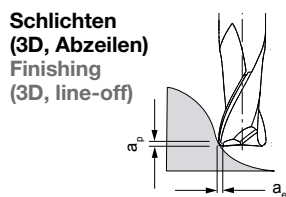
| BZG | Kühlung Cooling | | | a _p [mm] | a _e [mm] | v _c [m/min] | f _z [mm/Zahn] f _z [mm/tooth] | | | | | | | | | | | | | | | | |
|-----|-----------------|------------------|-----|------------------------|------------------------|---------------------------|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | Trocken Dry | Luft/MMS Air/MMS | KSS | | | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | | | | | | | | | |
| | | | | | | | 0,40 | 0,50 | 0,60 | 0,80 | 1,00 | 1,50 | 1,80 | 2,00 | 2,50 | 3,00 | 4,00 | 5,00 | 6,00 | 8,00 | 10,00 | 12,00 | |
| P | P1 | ● | ● | ● | 0,012xD | 0,65xD | 190 - 250 | 0,008 | 0,010 | 0,011 | 0,015 | 0,019 | 0,027 | 0,033 | 0,038 | 0,048 | 0,058 | 0,080 | 0,102 | 0,119 | 0,157 | 0,190 | 0,223 |
| | P2 | ● | ● | ● | 0,012xD | 0,65xD | 190 - 250 | 0,008 | 0,010 | 0,011 | 0,015 | 0,019 | 0,027 | 0,033 | 0,038 | 0,048 | 0,058 | 0,080 | 0,102 | 0,119 | 0,157 | 0,190 | 0,223 |
| | P3 | ● | ● | ● | 0,012xD | 0,65xD | 180 - 250 | 0,007 | 0,009 | 0,011 | 0,014 | 0,018 | 0,025 | 0,032 | 0,036 | 0,045 | 0,055 | 0,076 | 0,097 | 0,113 | 0,149 | 0,181 | 0,212 |
| | P4 | | ● | ● | 0,012xD | 0,65xD | 180 - 230 | 0,008 | 0,010 | 0,011 | 0,015 | 0,019 | 0,027 | 0,033 | 0,038 | 0,048 | 0,058 | 0,080 | 0,102 | 0,119 | 0,157 | 0,190 | 0,223 |
| | P5 | | ● | ● | 0,012xD | 0,65xD | 180 - 230 | 0,007 | 0,008 | 0,010 | 0,013 | 0,017 | 0,023 | 0,029 | 0,033 | 0,042 | 0,051 | 0,070 | 0,089 | 0,105 | 0,138 | 0,167 | 0,196 |
| M | M1 | | | ● | 0,013xD | 0,4xD | 90 - 120 | 0,007 | 0,008 | 0,010 | 0,013 | 0,017 | 0,023 | 0,029 | 0,033 | 0,042 | 0,051 | 0,070 | 0,089 | 0,105 | 0,138 | 0,167 | 0,196 |
| | M2 | | | ● | 0,012xD | 0,4xD | 70 - 90 | 0,006 | 0,007 | 0,008 | 0,011 | 0,014 | 0,019 | 0,024 | 0,028 | 0,035 | 0,042 | 0,058 | 0,074 | 0,087 | 0,114 | 0,139 | 0,163 |
| K | K1 | ● | ● | ● | 0,012xD | 0,65xD | 200 - 250 | 0,008 | 0,010 | 0,011 | 0,015 | 0,019 | 0,027 | 0,033 | 0,038 | 0,048 | 0,058 | 0,080 | 0,102 | 0,119 | 0,157 | 0,190 | 0,223 |
| | K2 | ● | ● | ● | 0,012xD | 0,65xD | 190 - 250 | 0,007 | 0,008 | 0,010 | 0,013 | 0,017 | 0,023 | 0,029 | 0,033 | 0,042 | 0,051 | 0,070 | 0,089 | 0,105 | 0,138 | 0,167 | 0,196 |
| | K3 | ● | ● | ● | 0,012xD | 0,65xD | 190 - 250 | 0,006 | 0,007 | 0,008 | 0,011 | 0,014 | 0,019 | 0,024 | 0,028 | 0,035 | 0,042 | 0,058 | 0,074 | 0,087 | 0,114 | 0,139 | 0,163 |
| H | H1 | ● | ● | | 0,012xD | 0,65xD | 120 - 200 | 0,006 | 0,007 | 0,009 | 0,012 | 0,014 | 0,020 | 0,025 | 0,029 | 0,036 | 0,044 | 0,061 | 0,077 | 0,090 | 0,119 | 0,144 | 0,170 |
| | H2 | | ● | | 0,01xD | 0,65xD | 80-120 | 0,004 | 0,005 | 0,006 | 0,008 | 0,010 | 0,013 | 0,017 | 0,019 | 0,024 | 0,029 | 0,040 | 0,051 | 0,060 | 0,079 | 0,096 | 0,113 |



TORROtec SC Hardened Z2

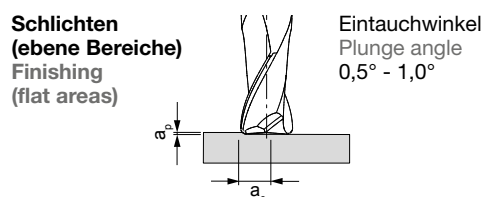
| BZG | Kühlung Cooling | | | a _p [mm] | a _e [mm] | v _c [m/min] | f _z [mm/Zahn] f _z [mm/tooth] | | | | | | | | | | | | | | | | |
|-----|-----------------|------------------|-----|------------------------|------------------------|---------------------------|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|--|--|
| | Trocken Dry | Luft/MMS Air/MMS | KSS | | | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | | | | | | | | | |
| | | | | | | | 0,40 | 0,50 | 0,60 | 0,80 | 1,00 | 1,50 | 1,80 | 2,00 | 2,50 | 3,00 | 4,00 | 5,00 | 6,00 | | | | |
| P | P1 | ● | ● | ● | 0,15xD | 0,45xD | 240 - 300 | 0,008 | 0,010 | 0,012 | 0,016 | 0,020 | 0,028 | 0,035 | 0,040 | 0,050 | 0,061 | 0,084 | 0,107 | 0,125 | | | |
| | P2 | ● | ● | ● | 0,15xD | 0,45xD | 240 - 300 | 0,008 | 0,010 | 0,012 | 0,016 | 0,020 | 0,028 | 0,035 | 0,040 | 0,050 | 0,061 | 0,084 | 0,107 | 0,125 | | | |
| | P3 | ● | ● | ● | 0,15xD | 0,45xD | 220 - 300 | 0,008 | 0,010 | 0,011 | 0,015 | 0,019 | 0,027 | 0,033 | 0,038 | 0,048 | 0,058 | 0,080 | 0,102 | 0,119 | | | |
| | P4 | | ● | ● | 0,15xD | 0,45xD | 240-280 | 0,008 | 0,010 | 0,012 | 0,016 | 0,020 | 0,028 | 0,035 | 0,040 | 0,050 | 0,061 | 0,084 | 0,107 | 0,125 | | | |
| | P5 | | ● | ● | 0,15xD | 0,45xD | 200 - 280 | 0,007 | 0,009 | 0,011 | 0,014 | 0,018 | 0,025 | 0,031 | 0,035 | 0,044 | 0,054 | 0,074 | 0,094 | 0,110 | | | |
| K | K1 | ● | ● | ● | 0,15xD | 0,55xD | 250 - 300 | 0,010 | 0,012 | 0,014 | 0,019 | 0,024 | 0,034 | 0,042 | 0,048 | 0,060 | 0,073 | 0,101 | 0,128 | 0,150 | | | |
| | K2 | ● | ● | ● | 0,15xD | 0,55xD | 240 - 300 | 0,008 | 0,010 | 0,012 | 0,016 | 0,020 | 0,028 | 0,035 | 0,040 | 0,050 | 0,061 | 0,084 | 0,107 | 0,125 | | | |
| | K3 | ● | ● | ● | 0,15xD | 0,55xD | 240 - 300 | 0,006 | 0,007 | 0,009 | 0,012 | 0,015 | 0,020 | 0,026 | 0,029 | 0,037 | 0,045 | 0,061 | 0,078 | 0,091 | | | |
| H | H1 | ● | ● | | 0,06xD | 0,35xD | 180 - 250 | 0,006 | 0,007 | 0,009 | 0,012 | 0,015 | 0,020 | 0,026 | 0,029 | 0,037 | 0,045 | 0,061 | 0,078 | 0,091 | | | |
| | H2 | | ● | | 0,025xD | 0,25xD | 140 - 180 | 0,003 | 0,004 | 0,005 | 0,006 | 0,008 | 0,011 | 0,014 | 0,016 | 0,020 | 0,024 | 0,034 | 0,043 | 0,050 | | | |

Schnittwertempfehlung für Eckfräser, Vorschub und Schnittgeschwindigkeit
Recommended cutting values for corner milling cutters, feed and cutting speed



TORROtec SC Hardened Z2

| BZG | Kühlung Cooling | | | a _p [mm] | a _e [mm] | v _c [m/min] | f _z [mm/Zahn] f _z [mm/tooth] | | | | | | | | | | | | |
|-----|-----------------|---------------------|-----|------------------------|------------------------|---------------------------|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | Trocken Dry | Luft/MMS Air/MMS | KSS | | | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | | | | | |
| | | | | | | | 0,40 | 0,50 | 0,60 | 0,80 | 1,00 | 1,50 | 1,80 | 2,00 | 2,50 | 3,00 | 4,00 | 5,00 | 6,00 |
| P1 | ● | ● | ● | 0,012xD | 0,022xD | 280 - 340 | 0,008 | 0,010 | 0,011 | 0,015 | 0,019 | 0,027 | 0,033 | 0,038 | 0,048 | 0,058 | 0,080 | 0,102 | 0,119 |
| P2 | ● | ● | ● | 0,012xD | 0,022xD | 260 - 320 | 0,008 | 0,010 | 0,011 | 0,015 | 0,019 | 0,027 | 0,033 | 0,038 | 0,048 | 0,058 | 0,080 | 0,102 | 0,119 |
| P3 | ● | ● | ● | 0,012xD | 0,022xD | 240 - 320 | 0,007 | 0,009 | 0,011 | 0,014 | 0,018 | 0,025 | 0,032 | 0,036 | 0,045 | 0,055 | 0,076 | 0,097 | 0,113 |
| P4 | | ● | ● | 0,012xD | 0,022xD | 260 - 300 | 0,008 | 0,010 | 0,011 | 0,015 | 0,019 | 0,027 | 0,033 | 0,038 | 0,048 | 0,058 | 0,080 | 0,102 | 0,119 |
| P5 | | ● | ● | 0,012xD | 0,022xD | 220 - 300 | 0,007 | 0,008 | 0,010 | 0,013 | 0,017 | 0,023 | 0,029 | 0,033 | 0,042 | 0,051 | 0,070 | 0,089 | 0,105 |
| K1 | ● | ● | ● | 0,012xD | 0,022xD | 280 - 340 | 0,008 | 0,010 | 0,011 | 0,015 | 0,019 | 0,027 | 0,033 | 0,038 | 0,048 | 0,058 | 0,080 | 0,102 | 0,119 |
| K2 | ● | ● | ● | 0,012xD | 0,022xD | 260 - 320 | 0,007 | 0,008 | 0,010 | 0,013 | 0,017 | 0,023 | 0,029 | 0,033 | 0,042 | 0,051 | 0,070 | 0,089 | 0,105 |
| K3 | ● | ● | ● | 0,012xD | 0,022xD | 260 - 320 | 0,006 | 0,007 | 0,008 | 0,011 | 0,014 | 0,019 | 0,024 | 0,028 | 0,035 | 0,042 | 0,058 | 0,074 | 0,087 |
| H1 | ● | ● | | 0,012xD | 0,022xD | 190 - 250 | 0,006 | 0,007 | 0,009 | 0,012 | 0,014 | 0,020 | 0,025 | 0,029 | 0,036 | 0,044 | 0,061 | 0,077 | 0,090 |
| H2 | | ● | | 0,01xD | 0,02xD | 150-190 | 0,004 | 0,005 | 0,006 | 0,008 | 0,010 | 0,013 | 0,017 | 0,019 | 0,024 | 0,029 | 0,040 | 0,051 | 0,060 |
| H3 | | ● | | 0,007xD | 0,017xD | 80 - 150 | 0,003 | 0,004 | 0,005 | 0,007 | 0,008 | 0,012 | 0,015 | 0,017 | 0,021 | 0,025 | 0,035 | 0,045 | 0,052 |
| H4 | ● | ● | | 0,008xD | 0,018xD | 150-200 | 0,004 | 0,005 | 0,006 | 0,008 | 0,010 | 0,013 | 0,017 | 0,019 | 0,024 | 0,029 | 0,040 | 0,051 | 0,060 |

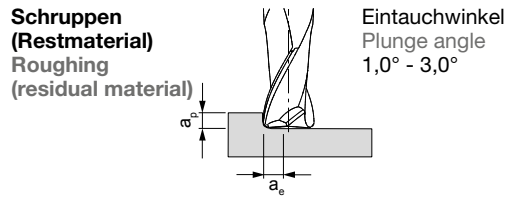


TORROtec SC Hardened Z2

| BZG | Kühlung Cooling | | | a _p [mm] | a _e [mm] | v _c [m/min] | f _z [mm/Zahn] f _z [mm/tooth] | | | | | | | | | | | | |
|-----|-----------------|---------------------|-----|------------------------|------------------------|---------------------------|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | Trocken Dry | Luft/MMS Air/MMS | KSS | | | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | | | | | |
| | | | | | | | 0,40 | 0,50 | 0,60 | 0,80 | 1,00 | 1,50 | 1,80 | 2,00 | 2,50 | 3,00 | 4,00 | 5,00 | 6,00 |
| P1 | ● | ● | ● | 0,012xD | 0,65xD | 190 - 250 | 0,008 | 0,010 | 0,011 | 0,015 | 0,019 | 0,027 | 0,033 | 0,038 | 0,048 | 0,058 | 0,080 | 0,102 | 0,119 |
| P2 | ● | ● | ● | 0,012xD | 0,65xD | 190 - 250 | 0,008 | 0,010 | 0,011 | 0,015 | 0,019 | 0,027 | 0,033 | 0,038 | 0,048 | 0,058 | 0,080 | 0,102 | 0,119 |
| P3 | ● | ● | ● | 0,012xD | 0,65xD | 180 - 250 | 0,007 | 0,009 | 0,011 | 0,014 | 0,018 | 0,025 | 0,032 | 0,036 | 0,045 | 0,055 | 0,076 | 0,097 | 0,113 |
| P4 | | ● | ● | 0,012xD | 0,65xD | 180-230 | 0,008 | 0,010 | 0,011 | 0,015 | 0,019 | 0,027 | 0,033 | 0,038 | 0,048 | 0,058 | 0,080 | 0,102 | 0,119 |
| P5 | | ● | ● | 0,012xD | 0,65xD | 180-230 | 0,007 | 0,008 | 0,010 | 0,013 | 0,017 | 0,023 | 0,029 | 0,033 | 0,042 | 0,051 | 0,070 | 0,089 | 0,105 |
| K1 | ● | ● | ● | 0,012xD | 0,65xD | 200 - 250 | 0,008 | 0,010 | 0,011 | 0,015 | 0,019 | 0,027 | 0,033 | 0,038 | 0,048 | 0,058 | 0,080 | 0,102 | 0,119 |
| K2 | ● | ● | ● | 0,012xD | 0,65xD | 190 - 250 | 0,007 | 0,008 | 0,010 | 0,013 | 0,017 | 0,023 | 0,029 | 0,033 | 0,042 | 0,051 | 0,070 | 0,089 | 0,105 |
| K3 | ● | ● | ● | 0,012xD | 0,65xD | 190 - 250 | 0,006 | 0,007 | 0,008 | 0,011 | 0,014 | 0,019 | 0,024 | 0,028 | 0,035 | 0,042 | 0,058 | 0,074 | 0,087 |
| H1 | ● | ● | | 0,012xD | 0,65xD | 120 - 200 | 0,006 | 0,007 | 0,009 | 0,012 | 0,014 | 0,020 | 0,025 | 0,029 | 0,036 | 0,044 | 0,061 | 0,077 | 0,090 |
| H2 | | ● | | 0,01xD | 0,65xD | 80 - 120 | 0,004 | 0,005 | 0,006 | 0,008 | 0,010 | 0,013 | 0,017 | 0,019 | 0,024 | 0,029 | 0,040 | 0,051 | 0,060 |
| H3 | | ● | | 0,006xD | 0,45xD | 35 - 80 | 0,003 | 0,004 | 0,005 | 0,007 | 0,008 | 0,012 | 0,015 | 0,017 | 0,021 | 0,025 | 0,035 | 0,045 | 0,052 |
| H4 | ● | ● | | 0,008xD | 0,55xD | 80 - 120 | 0,004 | 0,005 | 0,006 | 0,008 | 0,010 | 0,013 | 0,017 | 0,019 | 0,024 | 0,029 | 0,040 | 0,051 | 0,060 |

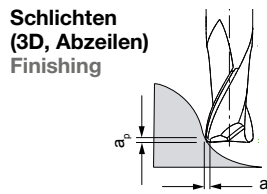
* Angegebene Schnittdaten sind als Richtwert zu sehen, welche durch Versuche für jeden Anwendungsfall separat optimiert werden.
* Recommended cutting data has to be seen as a reference which can be optimised for each application through trials separately

Schnittwertempfehlung für Eckfräser, Vorschub und Schnittgeschwindigkeit
Recommended cutting values for corner milling cutters, feed and cutting speed



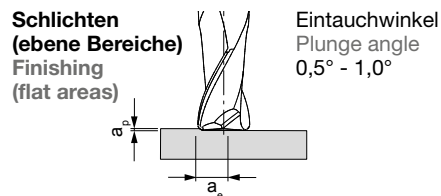
TORROtec SC N Z2

| BZG | Kühlung Cooling | | | a_p [mm] | a_e [mm] | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | | | | |
|-----|-----------------|------------------|-----|---------------|---------------|------------------|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | Trocken Dry | Luft/MMS Air/MMS | KSS | | | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | | |
| | | | | | | | 2,00 | 3,00 | 4,00 | 5,00 | 6,00 | 8,00 | 10,00 | 12,00 | 16,00 | 20,00 |
| M | M1 | | ● | 0,1xD | 0,4xD | 85 - 110 | 0,035 | 0,054 | 0,074 | 0,094 | 0,110 | 0,145 | 0,176 | 0,207 | 0,264 | 0,304 |
| | M2 | | ● | 0,1xD | 0,4xD | 60 - 85 | 0,029 | 0,045 | 0,061 | 0,078 | 0,091 | 0,120 | 0,146 | 0,172 | 0,219 | 0,252 |
| N | N1 | | ● | 0,15xD | 0,6xD | 400 - 600 | 0,038 | 0,057 | 0,062 | 0,082 | 0,090 | 0,102 | 0,120 | 0,155 | 0,180 | 0,205 |
| N | N2 | | ● | 0,15xD | 0,6xD | 300 - 580 | 0,042 | 0,063 | 0,068 | 0,090 | 0,099 | 0,112 | 0,132 | 0,171 | 0,198 | 0,226 |
| | N3 | ● | ● | ● | 0,15xD | 0,6xD | 300 - 500 | 0,038 | 0,057 | 0,062 | 0,082 | 0,090 | 0,102 | 0,120 | 0,155 | 0,180 |



TORROtec SC N Z2

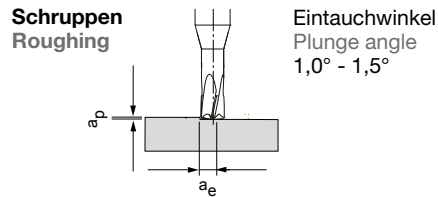
| BZG | Kühlung Cooling | | | a_p [mm] | a_e [mm] | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | | | | |
|-----|-----------------|------------------|-----|---------------|---------------|------------------|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | Trocken Dry | Luft/MMS Air/MMS | KSS | | | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | | |
| | | | | | | | 2,00 | 3,00 | 4,00 | 5,00 | 6,00 | 8,00 | 10,00 | 12,00 | 16,00 | 20,00 |
| M | M1 | | ● | 0,013xD | 0,023xD | 90 - 120 | 0,033 | 0,051 | 0,070 | 0,089 | 0,105 | 0,138 | 0,167 | 0,196 | 0,251 | 0,288 |
| | M2 | | ● | 0,012xD | 0,022xD | 70 - 90 | 0,028 | 0,042 | 0,058 | 0,074 | 0,087 | 0,114 | 0,139 | 0,163 | 0,208 | 0,239 |
| N | N1 | | ● | 0,015xD | 0,025xD | 400 - 600 | 0,038 | 0,057 | 0,062 | 0,082 | 0,090 | 0,102 | 0,120 | 0,155 | 0,180 | 0,205 |
| N | N2 | | ● | 0,015xD | 0,025xD | 300 - 580 | 0,042 | 0,063 | 0,068 | 0,090 | 0,099 | 0,112 | 0,132 | 0,171 | 0,198 | 0,226 |
| | N3 | ● | ● | ● | 0,015xD | 0,025xD | 300 - 500 | 0,038 | 0,057 | 0,062 | 0,082 | 0,090 | 0,102 | 0,120 | 0,155 | 0,180 |



TORROtec SC N

| BZG | Kühlung Cooling | | | a_p [mm] | a_e [mm] | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | | | | |
|-----|-----------------|------------------|-----|---------------|---------------|------------------|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | Trocken Dry | Luft/MMS Air/MMS | KSS | | | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | | |
| | | | | | | | 2,00 | 3,00 | 4,00 | 5,00 | 6,00 | 8,00 | 10,00 | 12,00 | 16,00 | 20,00 |
| M | M1 | | ● | 0,013xD | 0,4xD | 90 - 120 | 0,033 | 0,051 | 0,070 | 0,089 | 0,105 | 0,138 | 0,167 | 0,196 | 0,251 | 0,288 |
| | M2 | | ● | 0,012xD | 0,4xD | 70 - 90 | 0,028 | 0,042 | 0,058 | 0,074 | 0,087 | 0,114 | 0,139 | 0,163 | 0,208 | 0,239 |
| N | N1 | | ● | 0,015xD | 0,6xD | 380 - 600 | 0,038 | 0,057 | 0,062 | 0,082 | 0,090 | 0,102 | 0,120 | 0,155 | 0,180 | 0,205 |
| N | N2 | | ● | 0,015xD | 0,6xD | 300 - 580 | 0,042 | 0,063 | 0,068 | 0,090 | 0,099 | 0,112 | 0,132 | 0,171 | 0,198 | 0,226 |
| | N3 | ● | ● | ● | 0,015xD | 0,6xD | 300 - 500 | 0,038 | 0,057 | 0,062 | 0,082 | 0,090 | 0,102 | 0,120 | 0,155 | 0,180 |

Schnittwertempfehlung für Eckfräser, Vorschub und Schnittgeschwindigkeit
Recommended cutting values for corner milling cutters, feed and cutting speed

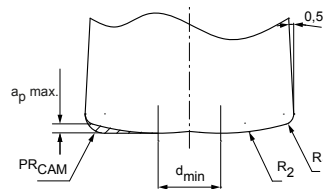


FEEDtec SC Universal Z4

| BZG | Kühlung Cooling | | | a_p [mm] | a_e [mm] | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | | | |
|-----|-----------------|---------------------|-----|---------------|---------------|------------------|---|-------|-------|-------|-------|-------|-------|-------|-------|
| | Trocken Dry | Luft/MMS Air/MMS | KSS | | | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | |
| | | | | | | | 2,00 | 3,00 | 4,00 | 5,00 | 6,00 | 8,00 | 10,00 | 12,00 | 16,00 |
| P1 | ● | ● | | 0,038xD | 0,6xD | 150 - 250 | 0,100 | 0,150 | 0,200 | 0,225 | 0,287 | 0,400 | 0,550 | 0,625 | 0,625 |
| P2 | ● | ● | | 0,038xD | 0,6xD | 150 - 250 | 0,100 | 0,150 | 0,200 | 0,225 | 0,287 | 0,400 | 0,550 | 0,625 | 0,625 |
| P3 | ● | ● | | 0,038xD | 0,6xD | 120 - 220 | 0,100 | 0,150 | 0,200 | 0,225 | 0,287 | 0,325 | 0,325 | 0,475 | 0,475 |
| P4 | | ● | ● | 0,038xD | 0,6xD | 90 - 110 | 0,100 | 0,150 | 0,200 | 0,225 | 0,287 | 0,325 | 0,325 | 0,475 | 0,475 |
| P5 | | ● | ● | 0,038xD | 0,6xD | 70 - 110 | 0,100 | 0,150 | 0,200 | 0,225 | 0,287 | 0,325 | 0,325 | 0,475 | 0,475 |
| K1 | ● | ● | | 0,038xD | 0,7xD | 250 - 300 | 0,100 | 0,150 | 0,200 | 0,225 | 0,287 | 0,400 | 0,550 | 0,625 | 0,625 |
| K2 | ● | ● | | 0,038xD | 0,7xD | 150 - 300 | 0,100 | 0,150 | 0,200 | 0,225 | 0,287 | 0,400 | 0,550 | 0,625 | 0,625 |
| K3 | ● | ● | | 0,038xD | 0,7xD | 150 - 200 | 0,100 | 0,150 | 0,200 | 0,225 | 0,287 | 0,325 | 0,325 | 0,475 | 0,475 |
| H1 | ● | ● | | 0,035xD | 0,7xD | 120 - 190 | 0,100 | 0,150 | 0,200 | 0,225 | 0,287 | 0,400 | 0,550 | 0,625 | 0,625 |
| H2 | ● | ● | | 0,028xD | 0,55xD | 100 - 120 | 0,100 | 0,150 | 0,175 | 0,200 | 0,250 | 0,250 | 0,300 | 0,350 | 0,400 |

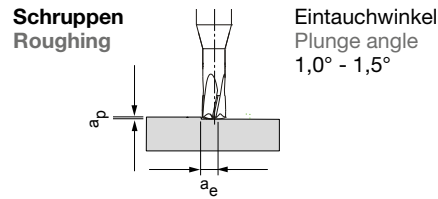
FEEDtec Universal

| Programmierdaten CAM data | | |
|--|-------------------------------------|------|
| Ø Fräser [mm] Ø End mill cutter [mm] | Abmessungen [mm] Dimensions [mm] | |
| | R_{th} | b |
| 3 | 0,20 | 0,75 |
| 4 | 0,30 | 1,00 |
| 5 | 0,40 | 1,35 |
| 6 | 0,50 | 1,50 |
| 8 | 0,70 | 2,10 |
| 10 | 0,85 | 2,50 |
| 12 | 1,00 | 3,10 |



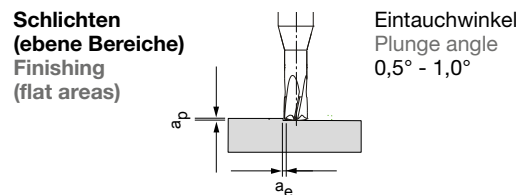
* Angegebene Schnittdaten sind als Richtwert zu sehen, welche durch Versuche für jeden Anwendungsfall separat optimiert werden.
 * Recommended cutting data has to be seen as a reference which can be optimised for each application through trials separately

Schnittwertempfehlung für Eckfräser, Vorschub und Schnittgeschwindigkeit
Recommended cutting values for corner milling cutters, feed and cutting speed



FEEDtec SC Hardened Z4/Z6

| BZG | Kühlung Cooling | | | ap [mm] | ae [mm] | vc [m/min] | fz [mm/Zahn] fz [mm/tooth] | | | | | | | | |
|-----|-----------------|------------------|-----|---------|---------|------------|---|-------|-------|-------|-------|-------|-------|-------|-------|
| | Trocken Dry | Luft/MMS Air/MMS | KSS | | | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | |
| | | | | | | | 2,00 | 3,00 | 4,00 | 5,00 | 6,00 | 8,00 | 10,00 | 12,00 | |
| P | P1 | ● | ● | | 0,042xD | 0,6xD | 240 - 340 | 0,100 | 0,130 | 0,180 | 0,210 | 0,250 | 0,350 | 0,460 | 0,580 |
| | P2 | ● | ● | | 0,042xD | 0,6xD | 240 - 320 | 0,100 | 0,130 | 0,180 | 0,210 | 0,250 | 0,350 | 0,450 | 0,560 |
| | P3 | ● | ● | | 0,042xD | 0,6xD | 240 - 340 | 0,100 | 0,130 | 0,170 | 0,200 | 0,240 | 0,340 | 0,430 | 0,520 |
| | P4 | | ● | ● | 0,042xD | 0,6xD | 160 - 200 | 0,100 | 0,130 | 0,180 | 0,210 | 0,250 | 0,350 | 0,400 | 0,500 |
| | P5 | | ● | ● | 0,042xD | 0,6xD | 160 - 220 | 0,100 | 0,110 | 0,160 | 0,200 | 0,230 | 0,330 | 0,380 | 0,470 |
| K | K1 | ● | ● | | 0,042xD | 0,7xD | 250 - 300 | 0,100 | 0,130 | 0,180 | 0,210 | 0,250 | 0,350 | 0,460 | 0,580 |
| | K2 | ● | ● | | 0,042xD | 0,7xD | 200 - 300 | 0,080 | 0,110 | 0,160 | 0,190 | 0,230 | 0,310 | 0,430 | 0,520 |
| | K3 | ● | ● | | 0,042xD | 0,7xD | 200 - 270 | 0,100 | 0,130 | 0,180 | 0,210 | 0,250 | 0,350 | 0,450 | 0,560 |
| H | H1 | ● | ● | | 0,042xD | 0,7xD | 150 - 250 | 0,071 | 0,103 | 0,135 | 0,170 | 0,210 | 0,280 | 0,350 | 0,420 |
| | H2 | | ● | | 0,04xD | 0,55xD | 110 - 150 | 0,062 | 0,083 | 0,106 | 0,142 | 0,172 | 0,220 | 0,280 | 0,330 |
| | H3 | | ● | | 0,03xD | 0,4xD | 60 - 120 | 0,044 | 0,065 | 0,086 | 0,109 | 0,131 | 0,170 | 0,210 | 0,245 |
| | H4 | ● | ● | | 0,035xD | 0,45xD | 90-120 | 0,055 | 0,070 | 0,090 | 0,120 | 0,140 | 0,180 | 0,220 | 0,250 |

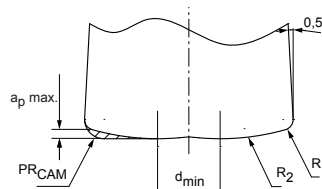


FEEDtec SC Hardened Z4/Z6

| BZG | Kühlung Cooling | | | ap [mm] | ae [mm] | vc [m/min] | fz [mm/Zahn] fz [mm/tooth] | | | | | | | | |
|-----|-----------------|------------------|-----|---------|---------|------------|---|-------|-------|-------|-------|-------|-------|-------|-------|
| | Trocken Dry | Luft/MMS Air/MMS | KSS | | | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | |
| | | | | | | | 2,00 | 3,00 | 4,00 | 5,00 | 6,00 | 8,00 | 10,00 | 12,00 | |
| H | H2 | | ● | | 0,008xD | 0,08xD | 160 - 185 | 0,040 | 0,048 | 0,058 | 0,072 | 0,105 | 0,144 | 0,182 | 0,210 |
| | H3 | | ● | | 0,004xD | 0,072xD | 110 - 170 | 0,028 | 0,037 | 0,046 | 0,063 | 0,084 | 0,110 | 0,148 | 0,174 |
| | H4 | ● | ● | | 0,006xD | 0,08xD | 160 - 180 | 0,038 | 0,042 | 0,055 | 0,070 | 0,092 | 0,128 | 0,160 | 0,190 |

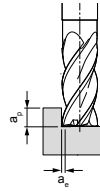
FEEDtec Hardened

| Programmierdaten CAM data | | |
|---|-------------------------------------|------|
| Ø Fräser [mm] Ø End mill cutter [mm] | Abmessungen [mm] Dimensions [mm] | |
| | Rth | b |
| 2 | 0,18 | 0,7 |
| 3 | 0,28 | 1,05 |
| 4 | 0,37 | 1,4 |
| 5 | 0,46 | 1,75 |
| 6 | 0,55 | 2,1 |
| 8 | 0,74 | 2,8 |
| 10 | 0,92 | 3,5 |
| 12 | 1,11 | 4,2 |



Schnittwertempfehlung für Eckfräser, Vorschub und Schnittgeschwindigkeit
Recommended cutting values for corner milling cutters, feed and cutting speed

Schruppen
Roughing

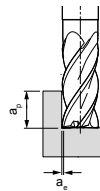


Eintauchwinkel
Plunge angle
1,0° - 3,0°

UNItec Pro H long neck FR,
UNItec Pro H overlength neck FR

| BZG | Kühlung Cooling | | | a_p [mm] | a_e [mm] | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | | | |
|----------|-----------------|---------------------|-----|---------------|---------------|------------------|---|-------|-------|-------|-------|-------|-------|-------|-------|
| | Trocken Dry | Luft/MMS Air/MMS | KSS | | | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | |
| | | | | | | | 4,00 | 5,00 | 6,00 | 8,00 | 10,00 | 12,00 | 16,00 | 20,00 | |
| P | P1 | ● | ● | ● | 0,5xD | 0,08xD | 160 - 200 | 0,032 | 0,040 | 0,048 | 0,055 | 0,075 | 0,095 | 0,110 | 0,140 |
| | P2 | ● | ● | ● | 0,5xD | 0,08xD | 150 - 190 | 0,032 | 0,040 | 0,048 | 0,055 | 0,075 | 0,095 | 0,110 | 0,140 |
| | P3 | ● | ● | ● | 0,5xD | 0,08xD | 130 - 190 | 0,032 | 0,040 | 0,048 | 0,055 | 0,075 | 0,095 | 0,110 | 0,140 |
| | P4 | | ● | ● | 0,5xD | 0,07xD | 130 - 150 | 0,027 | 0,034 | 0,041 | 0,047 | 0,064 | 0,081 | 0,094 | 0,119 |
| | P5 | | ● | ● | 0,5xD | 0,07xD | 130 - 160 | 0,027 | 0,034 | 0,041 | 0,047 | 0,064 | 0,081 | 0,094 | 0,119 |
| H | H1 | ● | ● | | 0,5xD | 0,02xD | 80 - 125 | 0,027 | 0,034 | 0,041 | 0,047 | 0,064 | 0,081 | 0,094 | 0,119 |
| | H2 | | ● | | 0,5xD | 0,012xD | 60 - 80 | 0,019 | 0,024 | 0,029 | 0,033 | 0,045 | 0,057 | 0,066 | 0,084 |

Schlichten
Finishing



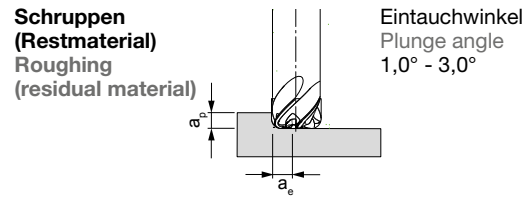
Eintauchwinkel
Plunge angle
0,5° - 1,0°

UNItec Pro H long neck FR,
UNItec Pro H overlength neck FR

| BZG | Kühlung Cooling | | | a_p [mm] | a_e [mm] | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | | | |
|----------|-----------------|---------------------|-----|---------------|---------------|------------------|---|-------|-------|-------|-------|-------|-------|-------|-------|
| | Trocken Dry | Luft/MMS Air/MMS | KSS | | | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | |
| | | | | | | | 4,00 | 5,00 | 6,00 | 8,00 | 10,00 | 12,00 | 16,00 | 20,00 | |
| P | P1 | ● | ● | ● | 1xD | 0,02xD | 180 - 220 | 0,025 | 0,030 | 0,040 | 0,050 | 0,065 | 0,075 | 0,090 | 0,105 |
| | P2 | ● | ● | ● | 1xD | 0,02xD | 160 - 200 | 0,025 | 0,030 | 0,040 | 0,050 | 0,065 | 0,075 | 0,090 | 0,105 |
| | P3 | ● | ● | ● | 1xD | 0,02xD | 140 - 200 | 0,025 | 0,030 | 0,040 | 0,050 | 0,065 | 0,075 | 0,090 | 0,105 |
| | P4 | | ● | ● | 1xD | 0,02xD | 140-160 | 0,021 | 0,026 | 0,034 | 0,043 | 0,055 | 0,064 | 0,077 | 0,089 |
| | P5 | | ● | ● | 1xD | 0,02xD | 140 - 170 | 0,021 | 0,026 | 0,034 | 0,043 | 0,055 | 0,064 | 0,077 | 0,089 |
| H | H1 | ● | ● | | 1xD | 0,015xD | 90 - 130 | 0,021 | 0,026 | 0,034 | 0,043 | 0,055 | 0,064 | 0,077 | 0,089 |
| | H2 | | ● | | 1xD | 0,008xD | 70-90 | 0,015 | 0,018 | 0,024 | 0,030 | 0,039 | 0,045 | 0,054 | 0,063 |

* Angegebene Schnittdaten sind als Richtwert zu sehen, welche durch Versuche für jeden Anwendungsfall separat optimiert werden.
* Recommended cutting data has to be seen as a reference which can be optimised for each application through trials separately

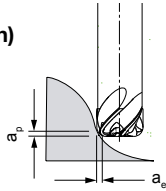
Schnittwertempfehlung für Eckfräser, Vorschub und Schnittgeschwindigkeit
 Recommended cutting values for corner milling cutters, feed and cutting speed



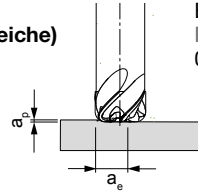
UNItec Pro H Superfinish FR Z5

| BZG | Kühlung Cooling | | | a _p [mm] | a _e [mm] | v _c [m/min] | f _z [mm/Zahn] f _z [mm/tooth] | | | | | | |
|-----|-----------------|---------------------|-----|------------------------|------------------------|---------------------------|--|-------|-------|-------|-------|-------|-------|
| | Trocken Dry | Luft/MMS Air/MMS | KSS | | | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | |
| | | | | | | | 4 | 5 | 6 | 8 | 10 | 12 | |
| P | P1 | ● | ● | ● | 0,15xD | 0,35xD | 210 - 270 | 0,080 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 |
| | P2 | ● | ● | ● | 0,15xD | 0,35xD | 210 - 270 | 0,080 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 |
| | P3 | ● | ● | ● | 0,15xD | 0,35xD | 220 - 270 | 0,080 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 |
| | P4 | | ● | ● | 0,15xD | 0,35xD | 200 - 250 | 0,070 | 0,080 | 0,090 | 0,110 | 0,130 | 0,160 |
| | P5 | | ● | ● | 0,15xD | 0,35xD | 200 - 250 | 0,070 | 0,080 | 0,090 | 0,110 | 0,130 | 0,160 |
| K | K1 | ● | ● | ● | 0,15xD | 0,4xD | 220 - 270 | 0,080 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 |
| | K2 | ● | ● | ● | 0,15xD | 0,4xD | 200 - 270 | 0,080 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 |
| | K3 | ● | ● | ● | 0,15xD | 0,4xD | 200 - 270 | 0,080 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 |
| H | H1 | ● | ● | | 0,06xD | 0,35xD | 180 - 250 | 0,060 | 0,080 | 0,090 | 0,110 | 0,130 | 0,160 |
| | H2 | | ● | | 0,025xD | 0,25xD | 140 - 180 | 0,040 | 0,060 | 0,070 | 0,085 | 0,095 | 0,120 |
| | H3 | | ● | | | | | | | | | | |
| | H4 | ● | ● | | | | | | | | | | |

**Schlichten
(3D, Abzeilen)**
Finishing
(3D, line-off)



**Schlichten
(ebene Bereiche)**
Finishing
(flat areas)

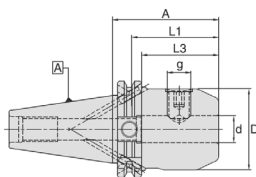


Eintauchwinkel
Plunge angle
0,5° - 1,0°

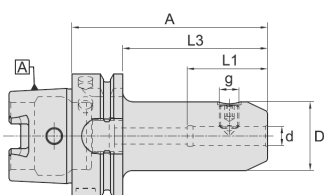
| | a_p [mm] | a_e [mm] | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | | a_p [mm] | a_e [mm] | v_c [m/min] | f_z [mm/Zahn] f_z [mm/tooth] | | | | | |
|---------|---------------|------------------|------------------|--|-------|-------|-------|-------|---------|---------------|------------------|------------------|--|-------|-------|-------|-------|----|
| | | | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | |
| | | | | 4 | 5 | 6 | 8 | 10 | 12 | | | | 4 | 5 | 6 | 8 | 10 | 12 |
| 0,012xD | 0,022xD | 250 - 320 | 0,050 | 0,060 | 0,080 | 0,090 | 0,110 | 0,130 | 0,012xD | 0,65xD | 190 - 250 | 0,050 | 0,060 | 0,080 | 0,090 | 0,110 | 0,130 | |
| 0,012xD | 0,022xD | 250 - 320 | 0,050 | 0,060 | 0,080 | 0,090 | 0,110 | 0,130 | 0,012xD | 0,65xD | 190 - 250 | 0,050 | 0,060 | 0,080 | 0,090 | 0,110 | 0,130 | |
| 0,012xD | 0,022xD | 240 - 320 | 0,050 | 0,060 | 0,080 | 0,090 | 0,110 | 0,130 | 0,012xD | 0,65xD | 180 - 250 | 0,050 | 0,060 | 0,080 | 0,090 | 0,110 | 0,130 | |
| 0,012xD | 0,022xD | 240 - 300 | 0,050 | 0,060 | 0,080 | 0,090 | 0,110 | 0,130 | 0,012xD | 0,65xD | 180 - 230 | 0,050 | 0,060 | 0,080 | 0,090 | 0,110 | 0,130 | |
| 0,012xD | 0,022xD | 240 - 300 | 0,050 | 0,060 | 0,080 | 0,090 | 0,110 | 0,130 | 0,012xD | 0,65xD | 180 - 230 | 0,050 | 0,060 | 0,080 | 0,090 | 0,110 | 0,130 | |
| 0,012xD | 0,022xD | 260 - 320 | 0,050 | 0,060 | 0,080 | 0,090 | 0,110 | 0,130 | 0,012xD | 0,65xD | 200 - 250 | 0,050 | 0,060 | 0,080 | 0,090 | 0,110 | 0,130 | |
| 0,012xD | 0,022xD | 250 - 320 | 0,050 | 0,060 | 0,080 | 0,090 | 0,110 | 0,130 | 0,012xD | 0,65xD | 190 - 250 | 0,050 | 0,060 | 0,080 | 0,090 | 0,110 | 0,130 | |
| 0,012xD | 0,022xD | 240 - 320 | 0,050 | 0,060 | 0,080 | 0,090 | 0,110 | 0,130 | 0,012xD | 0,65xD | 190 - 250 | 0,050 | 0,060 | 0,080 | 0,090 | 0,110 | 0,130 | |
| 0,012xD | 0,022xD | 210 - 300 | 0,050 | 0,060 | 0,080 | 0,090 | 0,110 | 0,130 | 0,012xD | 0,65xD | 160 - 230 | 0,050 | 0,060 | 0,080 | 0,090 | 0,110 | 0,130 | |
| 0,01xD | 0,02xD | 200 - 270 | 0,040 | 0,050 | 0,070 | 0,080 | 0,100 | 0,120 | 0,01xD | 0,65xD | 140 - 200 | 0,040 | 0,050 | 0,070 | 0,080 | 0,100 | 0,120 | |
| 0,007xD | 0,017xD | 80 - 220 | 0,035 | 0,045 | 0,060 | 0,075 | 0,090 | 0,110 | 0,006xD | 0,45xD | 50 - 140 | 0,035 | 0,045 | 0,060 | 0,075 | 0,090 | 0,110 | |
| 0,008xD | 0,018xD | 100 - 180 | 0,040 | 0,050 | 0,070 | 0,080 | 0,100 | 0,120 | 0,008xD | 0,55xD | 80 - 140 | 0,040 | 0,050 | 0,070 | 0,080 | 0,100 | 0,120 | |

* Angegebene Schnittdaten sind als Richtwert zu sehen, welche durch Versuche für jeden Anwendungsfall separat optimiert werden.
* Recommended cutting data has to be seen as a reference which can be optimised for each application through trials separately

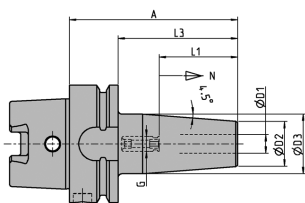
SK- und HSK- Werkzeugaufnahmen für 3D - Fräsen Vollhartmetall
SK- und HSK- Tool holders for 3D - Milling solid carbide



| Aufnahme SK40 für Schaftfräser Chuck SK40 for end milling cutter | | | | | | | |
|---|---------------------------------|-----------------------------|-------------------------------|------|---------------------------------|-----------------------------|-------------------------------|
| Ø Dc | SK-40-Bezeichnung SK-40-Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Ø Dc | SK-40-Bezeichnung SK-40-Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability |
| Ø6 | WSLH/06-50/SK-40 | 4600745 | ○ | Ø12 | WSLH/12-50/SK-40 | 4600760 | ○ |
| Ø8 | WSLH/08-50/SK-40 | 4600750 | ○ | Ø16 | WSLH/16-35/SK-40 | 4600771 | ● |
| Ø10 | WSLH/10-50/SK-40 | 4600755 | ○ | Ø20 | WSLH/20-35/SK-40 | 4600782 | ● |



| Aufnahme HSK-A63 für Schaftfräser Chuck HSK-A63 for end milling cutter | | | | Aufnahme HSK-A100 für Schaftfräser Chuck HSK-A100 for end milling cutter | | | |
|---|-------------------------------------|-----------------------------|-------------------------------|---|---------------------------------------|-----------------------------|-------------------------------|
| Ø Dc | HSK-A63-Bezeichnung HSK-A63-Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Ø Dc | HSK-A100-Bezeichnung HSK-A100-Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability |
| Ø6 | WSLH/06-65/HSK-A63 | 4601702 | ○ | Ø6 | WSLH/06-80/HSK-A100 | 4601614 | ○ |
| Ø8 | WSLH/08-65/HSK-A63 | 4601705 | ○ | Ø8 | WSLH/08-80/HSK-A100 | 4601616 | ○ |
| Ø10 | WSLH/10-65/HSK-A63 | 4601708 | ○ | Ø10 | WSLH/10-80/HSK-A100 | 4601618 | ○ |
| Ø12 | WSLH/12-80/HSK-A63 | 4601711 | ○ | Ø12 | WSLH/12-80/HSK-A100 | 4601620 | ○ |
| Ø16 | WSLH/16-80/HSK-A63 | 4601719 | ○ | Ø16 | WSLH/16-100/HSK-A100 | 4601624 | ● |
| Ø20 | WSLH/20-80/HSK-A63 | 4601727 | ● | Ø20 | WSLH/20-100/HSK-A100 | 4601628 | ● |




| Aufnahme HSK-A63 für Schaftfräser Chuck HSK-A63 for end milling cutter | | | | Aufnahme HSK-A100 für Schaftfräser Chuck HSK-A100 for end milling cutter | | | |
|---|-------------------------------------|-----------------------------|-------------------------------|---|---------------------------------------|-----------------------------|-------------------------------|
| Ø Dc | HSK-A63-Bezeichnung HSK-A63-Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Ø Dc | HSK-A100-Bezeichnung HSK-A100-Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability |
| Ø4 | T0400/HSK-A63 | 6726619 | ○ | Ø6 | T0600/HSK-A100 | 6726342 | ○ |
| Ø6 | T0600/HSK-A63 | 6726201 | ○ | Ø8 | T0800/HSK-A100 | 6726343 | ○ |
| Ø8 | T0800/HSK-A63 | 6726202 | ● | Ø10 | T1000/HSK-A100 | 6726344 | ● |
| Ø10 | T1000/HSK-A63 | 6726203 | ● | Ø12 | T1200/HSK-A100 | 6726345 | ● |
| Ø12 | T1200/HSK-A63 | 6726204 | ○ | Ø16 | T1600/HSK-A100 | 6726347 | ● |
| Ø16 | T1600/HSK-A63 | 6726206 | ● | Ø20 | T2000/HSK-A100 | 6726349 | ● |
| Ø20 | T2000/HSK-A63 | 6726207 | ● | | | | |

boehlerit

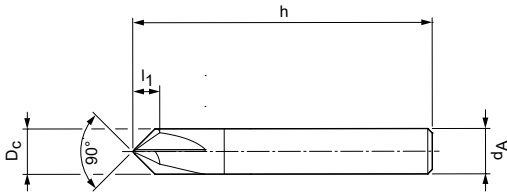
Fasbearbeitung, Entgraten
Chamfering, deburring



| Fasbearbeitung, Entgraten Chamfering, deburring | |
|--|---|
| | UNItec |
| |  |
| Zähnezahl Amount teeth | Z4 |
| P.1 | ■ |
| P.2 | ■ |
| P.3 | ■ |
| P.4 | ■ |
| P.5 | ■ |
| M.1 | □ |
| M.2 | □ |
| K.1 | ■ |
| K.2 | ■ |
| N.1 | ■ |
| N.2 | ■ |
| N.3 | □ |

UNItec chamfer 90°

Kurze Ausführung Z4
Execution short Z4



| Hard Facts | |
|--------------------|-----------------|
| Fräserdurchmesser: | 4,00 - 20,00 mm |
| Beschichtung: | TiAlN PVD |
| Schneidenzahl: | Z = 4 |
| Spitzenwinkel: | 90° |
| Drallwinkel: | 0° |
| Diameter: | 4.00 - 20.00 mm |
| Coating: | TiAlN PVD |
| Amount/Teeth: | Z = 4 |
| Angle: | 90° |
| Helix angle: | 0° |

| UNItec chamfer 90° | | |
|--------------------|-----|---|
| ISO | | |
| P | P.1 | ■ |
| | P.2 | ■ |
| | P.3 | ■ |
| | P.4 | ■ |
| | P.5 | ■ |
| M | M.1 | □ |
| | M.2 | □ |
| K | K.1 | ■ |
| | K.2 | ■ |
| N | N.1 | ■ |
| | N.2 | ■ |
| | N.3 | □ |

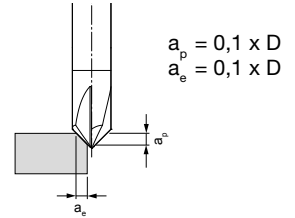
| Artikelbezeichnung Item Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Abmessungen [mm] Dimensions [mm] | | | | z | Schaft Shank |
|---------------------------------|-----------------------------|-------------------------------|----------------------------------|----------------|-------|----------------|---|-----------------|
| | | | D _C | d _A | h | l ₁ | | |
| UC04.009.054 SH Z4 HA | 5162909 | ● | 4,00 | 4,00 | 54,00 | 4,00 | 4 | HA |
| UC06.012.054 SH Z4 HA | 5162910 | ● | 6,00 | 6,00 | 54,00 | 6,00 | 4 | HA |
| UC08.015.058 SH Z4 HA | 5162911 | ● | 8,00 | 8,00 | 58,00 | 8,00 | 4 | HA |
| UC10.016.066 SH Z4 HA | 5162912 | ● | 10,00 | 10,00 | 66,00 | 10,00 | 4 | HA |
| UC12.018.073 SH Z4 HA | 5162913 | ● | 12,00 | 12,00 | 73,00 | 12,00 | 4 | HA |
| UC16.025.082 SH Z4 HA | 5162914 | ● | 16,00 | 16,00 | 82,00 | 16,00 | 4 | HA |
| UC20.030.092 SH Z4 HA | 5162915 | ⦿ | 20,00 | 20,00 | 92,00 | 20,00 | 4 | HA |

Bestellbeispiel Order example: 1 Stück piece 5162909 oder or UC04.009.054 SH Z4 HA
Genauere Schnittwertempfehlung siehe Seite 312
Detailed cutting recommendations, see page 312

- Verfügbar ab Lager Available from stock
- ⦿ Kurzfristig lieferbar Shortly available
- Lieferzeit auf Anfrage Delivery time on request

Schnittwertempfehlung für Eckfräser, Vorschub und Schnittgeschwindigkeit
Recommended cutting values for corner milling cutters, feed and cutting speed

Schlichten
 Finishing

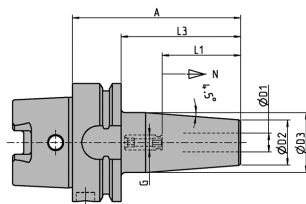


UNitec Chamfer Z4

| BZG | Kühlung Cooling | | | v _c [m/min] | f _z [mm/Zahn] f _z [mm/tooth] | | | | | | | |
|-----|---------------------|----------------|-------------|---------------------------|--|-------|-------|-------|-------|-------|-------|-------|
| | MMS/Luft MMS/Air | Trocken Dry | Nass Wet | | Fräserdurchmesser [mm] Cutter diameter [mm] | | | | | | | |
| | | | | | 4 | 6 | 8 | 10 | 12 | 16 | 20 | |
| P | P1 | ● | ● | ● | 220 - 265 | 0,041 | 0,058 | 0,075 | 0,091 | 0,105 | 0,132 | 0,153 |
| | P2 | ● | ● | ● | 170 - 245 | 0,041 | 0,058 | 0,075 | 0,091 | 0,105 | 0,132 | 0,153 |
| | P3 | ● | ● | ● | 135 - 160 | 0,039 | 0,055 | 0,071 | 0,086 | 0,100 | 0,125 | 0,145 |
| | P4 | ● | | ● | 110 | 0,027 | 0,039 | 0,050 | 0,060 | 0,070 | 0,088 | 0,102 |
| | P5 | | | ● | 110 - 165 | 0,039 | 0,056 | 0,072 | 0,088 | 0,102 | 0,128 | 0,148 |
| M | M1 | ● | | ● | 75 - 80 | 0,024 | 0,034 | 0,044 | 0,053 | 0,062 | 0,077 | 0,089 |
| | M2 | | | ● | 70 - 75 | 0,020 | 0,028 | 0,036 | 0,044 | 0,051 | 0,064 | 0,074 |
| K | K1 | ● | ● | ● | 290 | 0,068 | 0,097 | 0,124 | 0,151 | 0,176 | 0,220 | 0,255 |
| | K2 | ● | ● | ● | 120 - 265 | 0,058 | 0,082 | 0,106 | 0,128 | 0,149 | 0,187 | 0,217 |
| N | N1 | ● | ● | ● | 1015 | 0,068 | 0,097 | 0,124 | 0,151 | 0,176 | 0,220 | 0,255 |
| | N2 | ● | ● | ● | 390 - 675 | 0,071 | 0,102 | 0,131 | 0,158 | 0,185 | 0,231 | 0,268 |
| | N3 | ● | ● | ● | 290 - 485 | 0,054 | 0,077 | 0,100 | 0,121 | 0,141 | 0,176 | 0,204 |

* Angegebene Schnittdaten sind als Richtwert zu sehen, welche durch Versuche für jeden Anwendungsfall separat optimiert werden.
 * Recommended cutting data has to be seen as a reference which can be optimised for each application through trials separately

HSK- Werkzeugaufnahmen für Fasbearbeitung, Entgraten
HSK- Tool holders for Chamfering, deburring



| Aufnahme HSK-A63 für Schaftfräser Chuck HSK-A63 for end milling cutter | | | | Aufnahme HSK-A100 für Schaftfräser Chuck HSK-A100 for end milling cutter | | | |
|---|-------------------------------------|-----------------------------|-------------------------------|---|---------------------------------------|-----------------------------|-------------------------------|
| Ø Dc | HSK-A63-Bezeichnung HSK-A63-Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability | Ø Dc | HSK-A100-Bezeichnung HSK-A100-Code | Bestell-Nr. Ordering No. | Verfügbarkeit Availability |
| Ø4 | T0400/HSK-A63 | 6726619 | ○ | Ø6 | T0600/HSK-A100 | 6726342 | ○ |
| Ø6 | T0600/HSK-A63 | 6726201 | ○ | Ø8 | T0800/HSK-A100 | 6726343 | ○ |
| Ø8 | T0800/HSK-A63 | 6726202 | ● | Ø10 | T1000/HSK-A100 | 6726344 | ● |
| Ø10 | T1000/HSK-A63 | 6726203 | ● | Ø12 | T1200/HSK-A100 | 6726345 | ● |
| Ø12 | T1200/HSK-A63 | 6726204 | ○ | Ø16 | T1600/HSK-A100 | 6726347 | ● |
| Ø16 | T1600/HSK-A63 | 6726206 | ● | Ø20 | T2000/HSK-A100 | 6726349 | ● |
| Ø20 | T2000/HSK-A63 | 6726207 | ● | | | | |