Grampelhuber GmbH
Koaserbauerstrasse 18
4810 Gmunden / Austria
Telefon: +43 (0)7612 - 64902-0
Telefax: +43 (0)7612 - 64902-8
office@grampelhuber.at
www.grampelhuber.at

# WERKZEUGE FÜR COMPOSITES – CFK / GFK – TITAN – KUNSTSTOFF

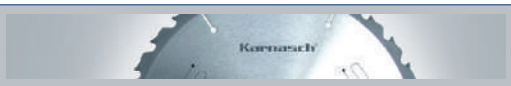
# TOOLS FOR COMPOSITES – CFRP / GFRP – TITANIUM – PLASTICS




Grampelhuber GmbH | Koaserbauerstrasse 18 | 4810 Gmunden | Austria
T: +43 (0)7612 - 64902-0 F: +43 (0)7612 - 64902-8 mail: office@grampelhuber.at
www.grampelhuber.at

PROFESSIONAL TOOLS

## INHALTSVERZEICHNIS · TABLE OF CONTENTS


| | Art. | Composite Tools | Material | | HSC high-speed-cutting | HPC | COMPOSITES | AFK Aramid | PVDF GF30 | Honey comb |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | C | C | C | C |
| C | 11 1350 |  | PKD PCD | 207 | | ✓ | ✓ | ✓ | ✓ | ✓ |
| C | 29 0080A |  | MICRO GRAIN | 170 | | ✓ | ✓ | ✓ | ✓ | ✓ |
| C | 29 0080B |  | MICRO GRAIN | 170 | | ✓ | | | | ✓ |
| C | 29 0120 |  | MICRO GRAIN | 172-173 | | ✓ | ✓ | | ✓ | |
| C | 29 0121 |  | MICRO GRAIN | 174 | | ✓ | ✓ | | ✓ | |
| C | 29 0122 |  | MICRO GRAIN | 175 | | ✓ | ✓ | | ✓ | |
| C | 29 0305 |  | MICRO GRAIN | 178 | | ✓ | ✓ | ✓ | ✓ | |
| C | 29 0412 |  | MICRO GRAIN | 178 | | ✓ | ✓ | ✓ | ✓ | |
| C | 29 0416 |  | MICRO GRAIN | 179 | | ✓ | ✓ | ✓ | ✓ | |
| C | 29 0417 |  | MICRO GRAIN | 179 | | ✓ | ✓ | ✓ | ✓ | |
| N | 29 6811 |  | ND MKD MCD | 196 | ✓ | ✓ | | | | |
| N | 29 6837 |  | MKD Mono-kristallin | 197 | ✓ | ✓ | | | | |
| N | 29 6838 |  | MKD Mono-kristallin | 198 | ✓ | ✓ | | | | |
| N | 29 6839 |  | MKD Mono-kristallin | 199 | ✓ | ✓ | | | | |
| N | 29 6840 |  | MKD Mono-kristallin | 200 | ✓ | ✓ | | | | |
| N | 29 6843 |  | MKD Mono-kristallin | 202 | ✓ | ✓ | | | | |
| N | 29 1652 |  | SPEZIAL SPECIAL MICRO-GRAIN | 180 | ✓ | ✓ | | | | |
| N | 29 1654 |  | SPEZIAL SPECIAL MICRO-GRAIN | 181 | ✓ | ✓ | | | | |
| N | 29 1658 |  | SPEZIAL SPECIAL MICRO-GRAIN | 182 | ✓ | ✓ | | | | |
| N | 29 1661 |  | SPEZIAL SPECIAL MICRO-GRAIN | 183 | ✓ | ✓ | | | | |
| N | 29 1751 |  | MICRO GRAIN | 184 | ✓ | | ✓ | | | |
| N | 29 1752 |  | MICRO GRAIN | 184 | ✓ | | ✓ | | | |




Grampelhuber GmbH | A-4810 Gmunden/Österreich | T: +43 (0)7612-64902-0 | F: +43 (0)7612-64902-8 | mail: office@grampelhuber.at | www.grampelhuber.at

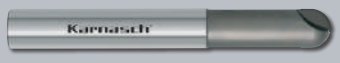
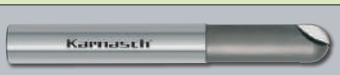
| PA66 GF30 | PTFE CF25 | POM GF25 | PF-31 | PEEK | PA-66 | PE-HD | Kevlar | Gold Silber Kupfer (Gold/Silver/Copper) | Schicht-stoffe Laminates | Spiegelfinish Mirror finish | Aluminium > 12% Si | MIT INNEN-KÜHLUNG with interior cooling | ZIRKONIUM (ZIRCONIUM) | INCONEL | TITAN titanium |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C | C | C | C | N | N | N | C | N | C | | N | | C | S | S |
| ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | | ✓ | | | | |
| ✓ | ✓ | ✓ | ✓ | | | | | | ✓ | | | | | | |
| | | | | ✓ | ✓ | | ✓ | | | | | | | | |
| ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | |
| ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | |
| ✓ | ✓ | ✓ | ✓ | | | | | | | | | ✓ | | | |
| ✓ | ✓ | ✓ | ✓ | | | | ✓ | | ✓ | | | | | | |
| ✓ | ✓ | ✓ | ✓ | | | | | | ✓ | | | | | | |
| ✓ | ✓ | ✓ | ✓ | | | | | | ✓ | | | | | | |
| ✓ | ✓ | ✓ | ✓ | | | | | | ✓ | | | ✓ | | | |
| | | | | ✓ | ✓ | ✓ | | ✓ | | ✓ | | | | | |
| | | | | ✓ | ✓ | ✓ | | ✓ | | ✓ | | | | | |
| | | | | ✓ | ✓ | ✓ | | ✓ | | ✓ | | | | | |
| | | | | ✓ | ✓ | ✓ | | ✓ | | ✓ | | | | | |
| | | | | ✓ | ✓ | ✓ | | ✓ | | ✓ | | | | | |
| | | | | ✓ | ✓ | ✓ | | ✓ | | ✓ | | | | | |
| | | | | ✓ | ✓ | ✓ | | ✓ | | | | | | | |
| | | | | ✓ | | | | ✓ | | | | | | | |
| | | | | ✓ | | | | ✓ | | | | | | | |
| | | | | ✓ | | | | ✓ | | | | | | | |
| | | | | ✓ | ✓ | ✓ | | ✓ | | | | | | | |
| | | | | ✓ | ✓ | ✓ | | ✓ | | | | | | | |





Grampelhuber GmbH | A-4810 Gmunden/Österreich | T: +43 (0)7612-64902-0 | F: +43 (0)7612-64902-8 | mail: office@grampelhuber.at | www.grampelhuber.at

## INHALTSVERZEICHNIS · TABLE OF CONTENTS


| | Art. | Composite Tools | Material | | HSC high-speed-cutting | HPC | COMPO-SITES | AFK Aramid | PVDF GF30 | Honey comb |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | C | C | C | C |
| N | 29 1753 |  | MICRO GRAIN | 185 | ✓ | | ✓ | | | |
| C | 29 1761 |  | MICRO GRAIN | 186 | | ✓ | ✓ | | | ✓ |
| C | 29 1762 |  | MICRO GRAIN | 186 | | ✓ | ✓ | | | ✓ |
| C | 29 1763 |  | MICRO GRAIN | 187 | | ✓ | ✓ | | | ✓ |
| C | 29 1771 |  | MICRO GRAIN | 187 | | ✓ | ✓ | | ✓ | |
| C | 11 6001 |  | MICRO GRAIN | 188 | | | | ✓ | | ✓ |
| C | 11 6002 |  | MICRO GRAIN | 188 | | | | ✓ | | ✓ |
| C | 11 6003 |  | MICRO GRAIN | 188 | | | | ✓ | | ✓ |
| C | 11 6004 |  | MICRO GRAIN | 188 | | | | ✓ | | ✓ |
| C | 29 6521 |  | CVD | 190 | ✓ | ✓ | ✓ | ✓ | ✓ | |
| C | 29 6522 |  BEST SELLER | CVD | 191 | ✓ | ✓ | ✓ | ✓ | ✓ | |
| C | 29 6523 |  BEST SELLER | CVD | 192 | ✓ | ✓ | ✓ | ✓ | ✓ | |
| C | 29 6524 |  BEST SELLER | CVD | 193 | ✓ | ✓ | ✓ | ✓ | ✓ | |
| C | 29 6525 |  BEST SELLER | CVD | 193 | ✓ | ✓ | ✓ | ✓ | ✓ | |
| C | 29 6526 |  BEST SELLER | CVD | 194 | ✓ | ✓ | ✓ | ✓ | ✓ | |
| N | 29 6620 |  | ND Natur-diamant | 195 | | | | | | |
| C | 30 6522 |  BEST SELLER | PKD PCD | 203 | | ✓ | ✓ | | ✓ | |
| C | 30 6523 |  BEST SELLER | PKD PCD | 204 | | ✓ | ✓ | | ✓ | |
| C | 30 6524 |  BEST SELLER | PKD PCD | 205 | | ✓ | ✓ | | ✓ | |
| C | 30 6528 |  | PKD PCD | 206 | | ✓ | ✓ | | ✓ | |
| C | 30 6534 |  | PKD PCD | 206 | | ✓ | ✓ | | ✓ | |
| C | 23 2005 |  | MICRO GRAIN | 171 | | ✓ | ✓ | | ✓ | |




Grampelhuber GmbH | A-4810 Gmunden/Österreich | T: +43 (0)7612-64902-0 | F: +43 (0)7612-64902-8 | mail: office@grampelhuber.at | www.grampelhuber.at

| PA66 GF30 | PTFE CF25 | POM GF25 | PF-31 | PEEK | PA-66 | PE-HD | Kevlar | Gold Silber Kupfer Gold/Silver/Copper | Schicht-stoffe Laminates | Spiegelfinish Mirror finish | Aluminium > 12% Si | MIT INNEN-KÜHLUNG with interior cooling | ZIRKONIUM ZIRCONIUM | INCONEL | TITAN titanium |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C | C | C | C | N | N | N | C | N | C | | N | | C | S | S |
| | | | | ✓ | ✓ | ✓ | | ✓ | | | | | | | |
| | ✓ | ✓ | | | | | | | | | | | | | |
| | ✓ | ✓ | | | | | | | | | | | | | |
| | ✓ | ✓ | | | | | | | | | | | | | |
| ✓ | ✓ | ✓ | | | | | ✓ | | ✓ | | | | | | |
| | | | | | | | ✓ | | ✓ | | | | | | |
| | | | | | | | ✓ | | ✓ | | | | | | |
| | | | | | | | ✓ | | ✓ | | | | | | |
| | | | | | | | ✓ | | ✓ | | | | | | |
| ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | | ✓ | | ✓ | | ✓ |
| ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | | ✓ | | ✓ | | ✓ |
| ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | | ✓ | | ✓ | | ✓ |
| ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | | ✓ | | ✓ | | ✓ |
| ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | | ✓ | | ✓ | | ✓ |
| ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | | ✓ | | ✓ | | ✓ |
| | | | | ✓ | | | | ✓ | | ✓ | | | | | |
| ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | | ✓ | | | | |
| ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | | ✓ | | | | |
| ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | | ✓ | | | | |
| ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | | ✓ | | | | |
| ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | | | |
| ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | | | | | | |





Grampelhuber GmbH | A-4810 Gmunden/Österreich | T: +43 (0)7612-64902-0 | F: +43 (0)7612-64902-8 | mail: office@grampelhuber.at | www.grampelhuber.at

## INHALTSVERZEICHNIS · TABLE OF CONTENTS


| | Art. | Composite Tools | Material | | HSC high-speed-cutting | HPC | COMPO-SITES | AFK Aramid | PVDF GF30 | Honey comb |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | C | C | C | C |
| C | 23 2006 |  | MICRO GRAIN | 171 | | ✓ | ✓ | | ✓ | |
| C | 29 6510 |  | CVD | 190 | ✓ | ✓ | ✓ | ✓ | ✓ | |
| S | 22 0410 |  | MICRO GRAIN | 176 | | | | | | |
| S | 22 0412 |  | MICRO GRAIN | 177 | | | | | | |


- ● Lagerware / Stock tool
- ○ Keine Lagerware, Lieferzeit und Preis auf Anfrage
  No stock tool. Price and delivery on request
- ◉ Lieferzeit kurzfristig da Rohlinglager vorhanden
  Short delivery deadline possible then blanks are on stock available
- % Sonderpreis. Solange Vorrat reicht. Rückgabe nicht möglich.
  Special price. While stocks last. Return not possible.
- 2-3 2-3 Arbeitstage Lieferzeit / 2-3 work days delivery time



Grampelhuber GmbH | A-4810 Gmunden/Österreich | T: +43 (0)7612-64902-0 | F: +43 (0)7612-64902-8 | mail: office@grampelhuber.at | www.grampelhuber.at

| PA66 GF30 | PTFE CF25 | POM GF25 | PF-31 | PEEK | PA-66 | PE-HD | Kevlar | Gold Silber Kupfer (Gold/Silver/Copper) | Schicht-stoffe Laminates | Spiegelfinish Mirror finish | Aluminium > 12% Si | MIT INNEN-KÜHLUNG with interior cooling | ZIRKONIUM (ZIRCONIUM) | INCONEL | TITAN titanium |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C | C | C | C | N | N | N | C | N | C | | N | | C | S | S |
| ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | | | | | | |
| ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | | ✓ | | ✓ | | ✓ |
| | | | | | | | | | | | | | | ✓ | |
| | | | | | | | | | | | | | | | ✓ |



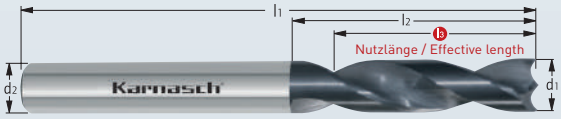


Grampelhuber GmbH | A-4810 Gmunden/Österreich | T: +43 (0)7612-64902-0 | F: +43 (0)7612-64902-8 | mail: office@grampelhuber.at | www.grampelhuber.at

# 29 0080 A | 29 0080 B

Vollhartmetall-Hochleistungsbohrer GFK/CFK
Solid carbide twist drill GFK/CFK

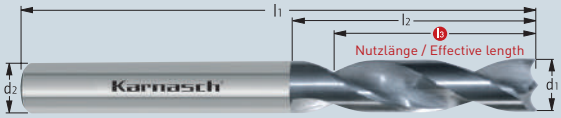
COMPO-SITES | CFK-ALU Composite CFRP-ALU Composites | PVDF GF30
GFK-CFK *GFRP-CFRP* | Schicht-stoffe Laminates | PEEK GF30
THERMO-PLAST THERMO-PLASTICS | Kevlar | PEEK CF30
DURO-PLASTE DURO-PLASTICS | AL/TI | GF GF25
Aramid fiber AFK-SFK | TI-CFK *TI-CFRP* | PVDF GF25
Hybrid-stoffe hybrid materials | PA66 GF30




Z 2

MICRO GRAIN | KARNASCH NORM
SPEZIAL SPECIAL | Form HA
30°
HSC High-Speed-Cutting
DCA-06 Polished
Air

GFK-CFK *GFRP-CFRP* | CFK-ALU Composite CFRP-ALU Composites | Kevlar
Kunststoff *plastic* | Schicht-stoffe Laminates | Plexiglas acrylic glass




Z 2

DIAMANT DIAMOND DCA-06 29 0080 A

POLIERT POLISHED 29 0080 B

| d1 | l3 | l2 | l1 | d2 h5 | Art. | Art. |
|---|---|---|---|---|---|---|
| 3,0 | 12 | 16 | 45 | 3,0 | 29 0080A 0300 012 | 29 0080B 0300 012 |
| 3,2 | 14 | 18 | 50 | 3,2 | 29 0080A 0320 014 | 29 0080B 0320 014 |
| 3,3 | 14 | 18 | 50 | 3,2 | – | 29 0080B 0330 014 |
| 3,5 | 15 | 20 | 50 | 3,5 | 29 0080A 0350 015 | 29 0080B 0350 015 |
| 3,7 | 15 | 20 | 52 | 3,7 | – | 29 0080B 0370 015 |
| 4,0 | 17 | 22 | 55 | 4,0 | 29 0080A 0400 017 | 29 0080B 0400 017 |
| 4,2 | 17 | 22 | 55 | 4,2 | – | 29 0080B 0420 017 |
| 4,5 | 18 | 25 | 57 | 4,5 | 29 0080A 0450 018 | 29 0080B 0450 018 |
| 4,7 | 18 | 24 | 58 | 4,7 | – | 29 0080B 0470 018 |
| 5,0 | 20 | 25 | 62 | 5,0 | 29 0080A 0500 020 | 29 0080B 0500 020 |
| 5,3 | 20 | 26 | 62 | 5,3 | – | 29 0080B 0530 020 |
| 5,5 | 20 | 28 | 65 | 5,5 | 29 0080A 0550 020 | 29 0080B 0550 020 |
| 5,8 | 20 | 28 | 66 | 5,8 | – | 29 0080B 0580 020 |
| 6,0 | 20 | 28 | 65 | 6,0 | 29 0080A 0600 020 | 29 0080B 0600 020 |
| 6,5 | 22 | 30 | 70 | 6,5 | 29 0080A 0650 022 | 29 0080B 0650 022 |
| 7,0 | 25 | 33 | 75 | 7,0 | 29 0080A 0700 025 | 29 0080B 0700 025 |
| 7,5 | 25 | 33 | 74 | 7,5 | – | 29 0080B 0750 025 |
| 8,0 | 27 | 36 | 80 | 8,0 | 29 0080A 0800 027 | 29 0080B 0800 027 |
| 8,5 | 27 | 36 | 80 | 8,5 | 29 0080A 0850 027 | 29 0080B 0850 027 |
| 9,0 | 30 | 40 | 85 | 9,0 | 29 0080A 0900 030 | 29 0080B 0900 030 |
| 9,5 | 30 | 37 | 84 | 9,5 | – | 29 0080B 0950 030 |
| 10,0 | 32 | 42 | 90 | 10,0 | 29 0080A 1000 032 | 29 0080B 1000 032 |
| 10,5 | 32 | 42 | 90 | 10,5 | – | 29 0080B 1050 032 |
| 11,0 | 34 | 47 | 95 | 11,0 | – | 29 0080B 1100 034 |
| 11,5 | 34 | 47 | 95 | 11,5 | – | 29 0080B 1150 034 |
| 12,0 | 35 | 50 | 100 | 12,0 | 29 0080A 1200 035 | 29 0080B 1200 035 |
| 13,0 | 35 | 50 | 100 | 13,0 | – | 29 0080B 1300 035 |
| 14,0 | 37 | 54 | 105 | 14,0 | – | 29 0080B 1400 037 |
| 15,0 | 38 | 56 | 110 | 15,0 | – | 29 0080B 1500 038 |
| 16,0 | 38 | 58 | 115 | 16,0 | – | 29 0080B 1600 038 |

Schnittdaten Cutting data 1411
Zeichnungen Drawings DXF/STEP

| | 29 0080 A | 29 0080 B |
|---|---|---|
| d1 tol. | Bohrertoleranz Drill tolerance | Bohrertoleranz Drill tolerance |
| > 3,0 | + 0,005 | + 0,000 |
| 6,0 | – 0,008 | – 0,012 |
| > 6,0 | + 0,005 | + 0,000 |
| 10,0 | – 0,010 | – 0,015 |
| > 10,0 | + 0,005 | + 0,000 |
| 14,0 | – 0,012 | – 0,018 |



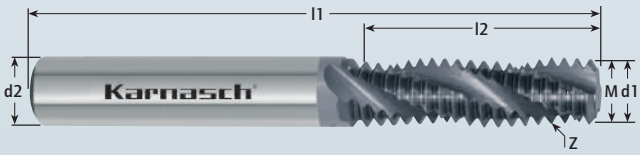
Grampelhuber GmbH | A-4810 Gmunden/Österreich | T: +43 (0)7612-64902-0 | F: +43 (0)7612-64902-8 | mail: office@grampelhuber.at | www.grampelhuber.at

## Diamantbeschichteter Vollhartmetall Gewindefräser, spiralisiert 30° für Innengewinde ohne Innenkühlung, ohne Senkstufe, metrisches ISO-Gewinde DIN 13 – 2,5×D

**23 2005**

Diamond coated solid carbide thread milling cutter, 30° spiral for internal threads, without internal cooling, without sunk stage, metric ISO-thread DIN13 – 2,5×D

COMPO-SITES | TI-CFK *TI-CFRP*
GRAPHIT *graphite* | PA66 GF30
GFK *GFRP* | PVDF GF30
CFK *CFRP* | PEEK GF30
Hybrid-stoffe *hybrid materials* | PEEK CF30
CFK-ALU Composite CFRP-ALU Composites | ZIRKON OXID ZIRCONIA
Schicht-stoffe Laminates







Schnittdaten Cutting data 1419 | Zeichnungen Drawings DXF/STEP

MICRO GRAIN | DIN 13
M | DIN 6535 Form HA
30° | 60° | HSC High-Speed-Cutting
DCC 0318
Air

| Art. | M | Stg | x D | l2 | l1 | d1 | d2 h5 | Z |
|---|---|---|---|---|---|---|---|---|
| 23 2005 04 070 25 | • M 4 | 0,7 | 2,5xD | 10,85 | 55 | 3,15 | 6 | 3 |
| 23 2005 05 080 25 | • M 5 | 0,8 | 2,5xD | 13,15 | 55 | 4,00 | 6 | 3 |
| 23 2005 06 100 25 | • M 6 | 1,0 | 2,5xD | 16,50 | 55 | 4,80 | 6 | 3 |
| 23 2005 08 125 25 | • M 8 | 1,25 | 2,5xD | 21,80 | 55 | 6,00 | 6 | 3 |
| 23 2005 10 150 25 | • M 10 | 1,50 | 2,5xD | 26,20 | 60 | 8,00 | 8 | 3 |
| 23 2005 12 175 25 | • M 12 | 1,75 | 2,5xD | 30,60 | 75 | 9,90 | 10 | 4 |

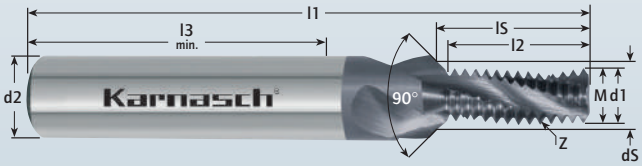
PKD - CVD Gewindefräser kurzfristig lieferbar!

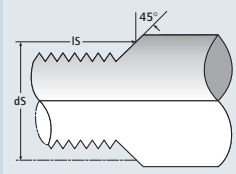
## Diamantbeschichteter Vollhartmetall-Gewindefräser, spiralisiert für Innengewinde ohne Innenkühlung, mit 90° Senkstufe, metrisches ISO-Gewinde DIN 13 – 2,0×D

**23 2006**

Diamond coated solid carbide thread milling cutter, 30° spiral for internal threads, without internal cooling, with 90° counter sunk stage, metric ISO-thread DIN 13 – 2,0×D

COMPO-SITES | TI-CFK *TI-CFRP*
GRAPHIT *graphite* | PA66 GF30
GFK *GFRP* | PVDF GF30
CFK *CFRP* | PEEK GF30
Hybrid-stoffe *hybrid materials* | PEEK CF30
CFK-ALU Composite CFRP-ALU Composites | ZIRKON OXID ZIRCONIA
Schicht-stoffe Laminates







Schnittdaten Cutting data 1419 | Zeichnungen Drawings DXF/STEP

MICRO GRAIN | DIN 13
M | DIN 6535 Form HA
30° | 60° | HSC High-Speed-Cutting
DCC 0318
Air

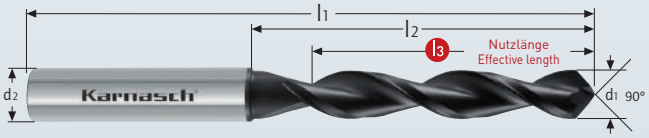
| Art. | M | Stg | x D | l2 | l3/min. | l1 | ds | ls | d1 | d2 h5 | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 23 2006 04 070 20 | • M 4 | 0,7 | 2,0xD | 8,75 | 36 | 55 | 4,2 | 9,3 | 3,14 | 6 | 3 |
| 23 2006 05 080 20 | • M 5 | 0,8 | 2,0xD | 10,75 | 36 | 55 | 5,3 | 11,3 | 4,00 | 6 | 3 |
| 23 2006 06 100 20 | • M 6 | 1,0 | 2,0xD | 12,40 | 36 | 65 | 6,3 | 13,1 | 4,80 | 8 | 3 |
| 23 2006 08 125 20 | • M 8 | 1,25 | 2,0xD | 16,80 | 40 | 75 | 8,3 | 17,6 | 6,50 | 10 | 3 |
| 23 2006 10 150 20 | • M 10 | 1,50 | 2,0xD | 20,10 | 45 | 80 | 10,3 | 21,2 | 8,20 | 12 | 3 |
| 23 2006 12 175 20 | • M 12 | 1,75 | 2,0xD | 25,20 | 45 | 90 | 12,3 | 26,4 | 9,90 | 14 | 4 |

PKD - CVD Gewindefräser kurzfristig lieferbar!

# 29 0120

Diamantbeschichtete VHM-Hochleistungsbohrer für CFK/GFK mit 90° Spitzwinkel vermeidet Delamination
Diamond coated solid carbide drill for CFRP/GFRP with 90° tip angle, prevents delamination

GRAPHIT *graphite*
COMPO-SITES
CFK *CFRP*
GFK *GFRP*
PEEK CF30
PEEK GF30
GF GF25
PVDF GF25
ZIRKON OXID ZIRCONIA
FR 4







MICRO GRAIN | KARNASCH NORM
MF | DIN 6535 Form HA
35° | 90°
Composites
DCC 0318
Air

## Empfohlene Schnittdaten / Recommended cutting data

| Werkstoffgruppe Material group | WERKSTOFF WORKPIECE MATERIAL | vc m/min | f mm/U Ø <3 | Ø 3,0 - 4,9 | Ø 5,0 - 7,9 | Ø 8,0 - 9,9 | Ø 10,0 - 12,0 |
|---|---|---|---|---|---|---|---|
| 8.3 | GFK / CFK Composites | 160 | 0,02 - 0,03 | 0,04 | 0,05 | 0,07 | 0,1 |

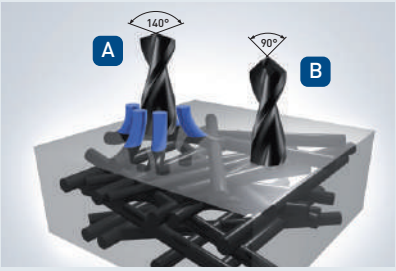
| Art. | d1 m7 | l3 | l2 | l1 | d2 h6 |
|---|---|---|---|---|---|
| 29 0120 0050 0045 | • 0,5 | 4,5 | 5,5 | 55 | 3 |
| 29 0120 0060 0045 | • 0,6 | 4,5 | 5,5 | 55 | 3 |
| 29 0120 0070 0045 | • 0,7 | 4,5 | 5,5 | 55 | 3 |
| 29 0120 0080 0045 | • 0,8 | 4,5 | 5,5 | 55 | 3 |
| 29 0120 0090 0045 | • 0,9 | 4,5 | 5,5 | 55 | 3 |
| 29 0120 0100 005 | • 1,0 | 5 | 8 | 55 | 3 |
| 29 0120 0110 008 | • 1,1 | 8 | 12 | 55 | 3 |
| 29 0120 0120 008 | • 1,2 | 8 | 12 | 55 | 3 |
| 29 0120 0130 008 | • 1,3 | 8 | 12 | 55 | 3 |
| 29 0120 0140 008 | • 1,4 | 8 | 12 | 55 | 3 |
| 29 0120 0150 008 | • 1,5 | 8 | 12 | 55 | 3 |
| 29 0120 0160 011 | • 1,6 | 11 | 16 | 68 | 3 |
| 29 0120 0170 011 | • 1,7 | 11 | 16 | 68 | 3 |
| 29 0120 0180 011 | • 1,8 | 11 | 16 | 68 | 3 |
| 29 0120 0190 011 | • 1,9 | 11 | 16 | 68 | 3 |
| 29 0120 0200 011 | • 2,0 | 11 | 16 | 68 | 3 |
| 29 0120 0210 014 | • 2,1 | 14 | 20 | 74 | 3 |
| 29 0120 0220 014 | • 2,2 | 14 | 20 | 74 | 3 |
| 29 0120 0230 014 | • 2,3 | 14 | 20 | 74 | 3 |
| 29 0120 0240 014 | • 2,4 | 14 | 20 | 74 | 3 |
| 29 0120 0250 014 | • 2,5 | 14 | 20 | 74 | 3 |
| 29 0120 0260 016 | • 2,6 | 16 | 23 | 81 | 3 |
| 29 0120 0270 016 | • 2,7 | 16 | 23 | 81 | 3 |
| 29 0120 0280 016 | • 2,8 | 16 | 23 | 81 | 3 |
| 29 0120 0290 016 | • 2,9 | 16 | 23 | 81 | 3 |
| 29 0120 0300 023 | • 3,0 | 23 | 28 | 66 | 6 |
| 29 0120 0310 023 | • 3,1 | 23 | 28 | 66 | 6 |
| 29 0120 03175 023 | • 3,175 | 23 | 28 | 66 | 6 |
| 29 0120 0320 023 | • 3,2 | 23 | 28 | 66 | 6 |
| 29 0120 0330 023 | • 3,3 | 23 | 28 | 66 | 6 |
| 29 0120 0340 023 | • 3,4 | 23 | 28 | 66 | 6 |
| 29 0120 0350 023 | • 3,5 | 23 | 28 | 66 | 6 |
| 29 0120 0360 023 | • 3,6 | 23 | 28 | 66 | 6 |
| 29 0120 0370 023 | • 3,7 | 23 | 28 | 66 | 6 |
| 29 0120 0380 023 | • 3,8 | 23 | 28 | 66 | 6 |
| 29 0120 0390 023 | • 3,9 | 23 | 28 | 66 | 6 |
| 29 0120 0400 029 | • 4,0 | 29 | 36 | 74 | 6 |
| 29 0120 0410 029 | • 4,1 | 29 | 36 | 74 | 6 |
| 29 0120 0420 029 | • 4,2 | 29 | 36 | 74 | 6 |
| 29 0120 0430 029 | • 4,3 | 29 | 36 | 74 | 6 |
| 29 0120 0440 029 | • 4,4 | 29 | 36 | 74 | 6 |
| 29 0120 0450 029 | • 4,5 | 29 | 36 | 74 | 6 |
| 29 0120 0460 029 | • 4,6 | 29 | 36 | 74 | 6 |
| 29 0120 0470 029 | • 4,7 | 29 | 36 | 74 | 6 |
| 29 0120 04763 029 | • 4,763 | 29 | 36 | 74 | 6 |
| 29 0120 0480 029 | • 4,8 | 29 | 36 | 74 | 6 |
| 29 0120 0490 029 | • 4,9 | 29 | 36 | 74 | 6 |
| 29 0120 0500 035 | • 5,0 | 35 | 44 | 82 | 6 |
| 29 0120 0510 035 | • 5,1 | 35 | 44 | 82 | 6 |
| 29 0120 0520 035 | • 5,2 | 35 | 44 | 82 | 6 |
| 29 0120 0530 035 | • 5,3 | 35 | 44 | 82 | 6 |
| 29 0120 0540 035 | • 5,4 | 35 | 44 | 82 | 6 |
| 29 0120 0550 035 | • 5,5 | 35 | 44 | 82 | 6 |
| 29 0120 0560 035 | • 5,6 | 35 | 44 | 82 | 6 |
| 29 0120 0570 035 | • 5,7 | 35 | 44 | 82 | 6 |
| 29 0120 0580 035 | • 5,8 | 35 | 44 | 82 | 6 |
| 29 0120 0590 035 | • 5,9 | 35 | 44 | 82 | 6 |

Schnittdaten Cutting data → 172
Film Movie
Zeichnungen Drawings → DXF/STEP

MULTIDIREKTIONAL



Chaotische Ausrichtung des Faserverlaufs
Chaotic alignment of fibre progress




**A** Delamination und Gratbildung mit konventionellen Bohrern.

**B** Sauberer Bohrungsaustritt durch optimierte Führungsfase des Bohrwerkzeuges.



Grampelhuber GmbH | A-4810 Gmunden/Österreich | T: +43 (0)7612-64902-0 | F: +43 (0)7612-64902-8 | mail: office@grampelhuber.at | www.grampelhuber.at

Diamantbeschichtete VHM-Hochleistungsbohrer für CFK/GFK mit 90° Spitzwinkel vermeidet Delamination
Diamond coated solid carbide drill for CFRP/GFRP with 90° tip angle, prevents delamination

**29 0120**

| Art. | d1 m7 | l3 | l2 | l1 | d2 h6 |
|---|---|---|---|---|---|
| 29 0120 0600 035 | • 6,0 | 35 | 44 | 82 | 6 |
| 29 0120 0610 043 | • 6,1 | 43 | 53 | 91 | 8 |
| 29 0120 0620 043 | • 6,2 | 43 | 53 | 91 | 8 |
| 29 0120 0630 043 | • 6,3 | 43 | 53 | 91 | 8 |
| 29 0120 0635 043 | • 6,350 | 43 | 53 | 91 | 8 |
| 29 0120 0640 043 | • 6,4 | 43 | 53 | 91 | 8 |
| 29 0120 0650 043 | • 6,5 | 43 | 53 | 91 | 8 |
| 29 0120 0660 043 | • 6,6 | 43 | 53 | 91 | 8 |
| 29 0120 0670 043 | • 6,7 | 43 | 53 | 91 | 8 |
| 29 0120 0680 043 | • 6,8 | 43 | 53 | 91 | 8 |
| 29 0120 0690 043 | • 6,9 | 43 | 53 | 91 | 8 |
| 29 0120 0700 043 | • 7,0 | 43 | 53 | 91 | 8 |
| 29 0120 0710 043 | • 7,1 | 43 | 53 | 91 | 8 |
| 29 0120 0720 043 | • 7,2 | 43 | 53 | 91 | 8 |
| 29 0120 0730 043 | • 7,3 | 43 | 53 | 91 | 8 |
| 29 0120 0740 043 | • 7,4 | 43 | 53 | 91 | 8 |
| 29 0120 0750 043 | • 7,5 | 43 | 53 | 91 | 8 |
| 29 0120 0760 043 | • 7,6 | 43 | 53 | 91 | 8 |
| 29 0120 0770 043 | • 7,7 | 43 | 53 | 91 | 8 |
| 29 0120 0780 043 | • 7,8 | 43 | 53 | 91 | 8 |
| 29 0120 0790 043 | • 7,9 | 43 | 53 | 91 | 8 |
| 29 0120 07938 043 | • 7,938 | 43 | 53 | 91 | 8 |
| 29 0120 0800 043 | • 8,0 | 43 | 53 | 91 | 8 |
| 29 0120 0810 049 | • 8,1 | 49 | 61 | 103 | 10 |
| 29 0120 0820 049 | • 8,2 | 49 | 61 | 103 | 10 |
| 29 0120 0830 049 | • 8,3 | 49 | 61 | 103 | 10 |
| 29 0120 0840 049 | • 8,4 | 49 | 61 | 103 | 10 |
| 29 0120 0850 049 | • 8,5 | 49 | 61 | 103 | 10 |

| Art. | d1 m7 | l3 | l2 | l1 | d2 h6 |
|---|---|---|---|---|---|
| 29 0120 0860 049 | • 8,6 | 49 | 61 | 103 | 10 |
| 29 0120 0870 049 | • 8,7 | 49 | 61 | 103 | 10 |
| 29 0120 0880 049 | • 8,8 | 49 | 61 | 103 | 10 |
| 29 0120 0890 049 | • 8,9 | 49 | 61 | 103 | 10 |
| 29 0120 0900 049 | • 9,0 | 49 | 61 | 103 | 10 |
| 29 0120 0910 049 | • 9,1 | 49 | 61 | 103 | 10 |
| 29 0120 0920 049 | • 9,2 | 49 | 61 | 103 | 10 |
| 29 0120 0930 049 | • 9,3 | 49 | 61 | 103 | 10 |
| 29 0120 0940 049 | • 9,4 | 49 | 61 | 103 | 10 |
| 29 0120 0950 049 | • 9,5 | 49 | 61 | 103 | 10 |
| 29 0120 09525 049 | • 9,525 | 49 | 61 | 103 | 10 |
| 29 0120 0960 049 | • 9,6 | 49 | 61 | 103 | 10 |
| 29 0120 0970 049 | • 9,7 | 49 | 61 | 103 | 10 |
| 29 0120 0980 049 | • 9,8 | 49 | 61 | 103 | 10 |
| 29 0120 0990 049 | • 9,9 | 49 | 61 | 103 | 10 |
| 29 0120 1000 049 | • 10,0 | 49 | 61 | 103 | 10 |
| 29 0120 1010 056 | • 10,1 | 56 | 71 | 118 | 12 |
| 29 0120 1020 056 | • 10,2 | 56 | 71 | 118 | 12 |
| 29 0120 1030 056 | • 10,3 | 56 | 71 | 118 | 12 |
| 29 0120 1040 056 | • 10,4 | 56 | 71 | 118 | 12 |
| 29 0120 1050 056 | • 10,5 | 56 | 71 | 118 | 12 |
| 29 0120 1060 056 | • 10,6 | 56 | 71 | 118 | 12 |
| 29 0120 1070 056 | • 10,7 | 56 | 71 | 118 | 12 |
| 29 0120 1080 056 | • 10,8 | 56 | 71 | 118 | 12 |
| 29 0120 1090 056 | • 10,9 | 56 | 71 | 118 | 12 |
| 29 0120 1100 056 | • 11,0 | 56 | 71 | 118 | 12 |
| 29 0120 11111 056 | • 11,111 | 56 | 71 | 118 | 12 |
| 29 0120 1200 056 | • 12,0 | 56 | 71 | 118 | 12 |

## CFK-Bohrertest
## CFK drill test




**Karnasch Art. 29 0120 – 6,0 mm**
Bohrungseintritt / drill entry
Material: CFK / CFRP

Schnittdaten / cutting data
Vc = 160 m/min
Vf = 850 mm/min
n(s) = 8493 min$^{-1}$
fz = 0,1 mm
ap = 20 mm




**Karnasch Art. 29 0120 – 6,0 mm**
Bohrungsaustritt / drill exit
Material: CFK / CFRP

Vergrößerung / Magnification: 30×




**CVD Bohrer 6,0 mm**
**Mitbewerber / competitor**
Bohrungseintritt / drill entry
Material: CFK / CFRP

Schnittdaten / cutting data
Vc = 160 m/min
Vf = 850 mm/min
n(s) = 8493 min$^{-1}$
fz = 0,1 mm
ap = 20 mm




**CVD Bohrer 6,0 mm**
**Mitbewerber / competitor**
Bohrungsaustritt / drill exit
Material: CFK / CFRP

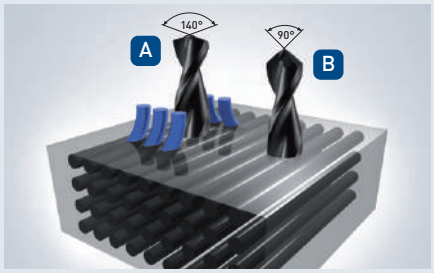
Vergrößerung / Magnification: 30×




UNIDIREKTIONAL



Faserverlauf in eine Richtung
Fibre progress in one direction




**A** Delamination und Gratbildung mit konventionellen Bohrern.

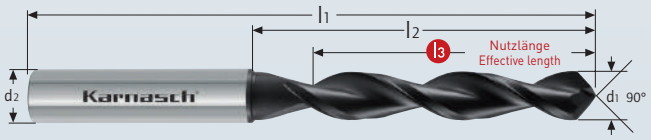
**B** Sauberer Bohrungsaustritt durch optimierte Führungsfase des Bohrwerkzeuges.

# 29 0121

Diamantbeschichtete VHM-Hochleistungsbohrer für CFK/GFK – unidirektional – mit 90° Spitzwinkel vermeidet Delamination

Diamond coated solid carbide drill for CFRP/GFRP – unidirectional – with 90° tip angle, prevents delamination

GRAPHIT *graphite*
COMPO-SITES
CFK *CFRP*
GFK *GFRP*
PEEK CF30
PEEK GF30
GF GF25
PVDF GF25
ZIRKON OXID ZIRCONIA
FR 4

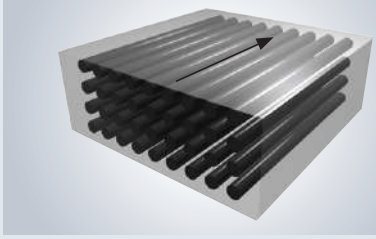



MICRO GRAIN
KARNASCH NORM
MF
DIN 6535 Form HA
35°
90°
Composites
DCC 0318
Air

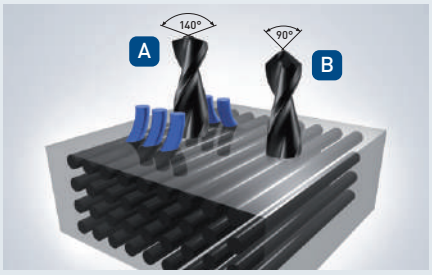
## Empfohlene Schnittdaten / Recommended cutting data

| Werkstoffgruppe Material group | WERKSTOFF WORKPIECE MATERIAL | vc m/min | f mm/U Ø 2,8 - 4,9 | Ø 5,0 - 7,9 | Ø 8,0 - 9,9 | Ø 10,0 - 12,0 |
|---|---|---|---|---|---|---|
| 8.3 | GFK / CFK Composites | 160 | 0,04 | 0,05 | 0,07 | 0,1 |

UNIDIREKTIONAL



Faserverlauf in eine Richtung
Fibre progress in one direction




A Delamination und Gratbildung mit konventionellen Bohrern.

B Sauberer Bohrungsaustritt durch optimierte Führungsfase des Bohrwerkzeuges.

Schnittdaten Cutting data
174
Zeichnungen Drawings
DXF/STEP

| Art. | d1 m7 | l3 | l2 | l1 | d2 h6 |
|---|---|---|---|---|---|
| 29 0121 0280 019 | % 2,8 | 19 | 24 | 66 | 6 |
| 29 0121 0290 019 | % 2,9 | 19 | 24 | 66 | 6 |
| 29 0121 0300 023 | % 3,0 | 23 | 28 | 66 | 6 |
| 29 0121 0310 023 | % 3,1 | 23 | 28 | 66 | 6 |
| 29 0121 03175 023 | % 3,175 | 23 | 28 | 66 | 6 |
| 29 0121 0320 023 | % 3,2 | 23 | 28 | 66 | 6 |
| 29 0121 0330 023 | % 3,3 | 23 | 28 | 66 | 6 |
| 29 0121 0340 023 | % 3,4 | 23 | 28 | 66 | 6 |
| 29 0121 0350 023 | % 3,5 | 23 | 28 | 66 | 6 |
| 29 0121 0360 023 | % 3,6 | 23 | 28 | 66 | 6 |
| 29 0121 0370 023 | % 3,7 | 23 | 28 | 66 | 6 |
| 29 0121 0380 023 | % 3,8 | 23 | 28 | 66 | 6 |
| 29 0121 0390 023 | % 3,9 | 23 | 28 | 66 | 6 |
| 29 0121 0400 029 | % 4,0 | 29 | 36 | 74 | 6 |
| 29 0121 0410 029 | % 4,1 | 29 | 36 | 74 | 6 |
| 29 0121 0420 029 | % 4,2 | 29 | 36 | 74 | 6 |
| 29 0121 0430 029 | % 4,3 | 29 | 36 | 74 | 6 |
| 29 0121 0440 029 | % 4,4 | 29 | 36 | 74 | 6 |
| 29 0121 0450 029 | % 4,5 | 29 | 36 | 74 | 6 |
| 29 0121 0460 029 | % 4,6 | 29 | 36 | 74 | 6 |
| 29 0121 0470 029 | % 4,7 | 29 | 36 | 74 | 6 |
| 29 0121 04763 029 | % 4,763 | 29 | 36 | 74 | 6 |
| 29 0121 0480 029 | % 4,8 | 29 | 36 | 74 | 6 |
| 29 0121 0490 029 | % 4,9 | 29 | 36 | 74 | 6 |
| 29 0121 0500 035 | % 5,0 | 35 | 44 | 82 | 6 |
| 29 0121 0510 035 | % 5,1 | 35 | 44 | 82 | 6 |
| 29 0121 0520 035 | % 5,2 | 35 | 44 | 82 | 6 |
| 29 0121 0530 035 | % 5,3 | 35 | 44 | 82 | 6 |
| 29 0121 0540 035 | % 5,4 | 35 | 44 | 82 | 6 |
| 29 0121 0550 035 | % 5,5 | 35 | 44 | 82 | 6 |
| 29 0121 0560 035 | % 5,6 | 35 | 44 | 82 | 6 |
| 29 0121 0570 035 | % 5,7 | 35 | 44 | 82 | 6 |
| 29 0121 0580 035 | % 5,8 | 35 | 44 | 82 | 6 |
| 29 0121 0590 035 | % 5,9 | 35 | 44 | 82 | 6 |

% Sonderpreis / Sale Artikel. Lieferbar solange Vorrat.
Special price / sale article. While stocks last.



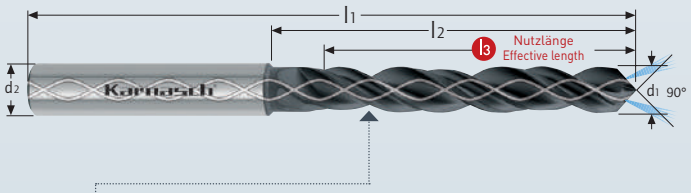
Grampelhuber GmbH | A-4810 Gmunden/Österreich | T: +43 (0)7612-64902-0 | F: +43 (0)7612-64902-8 | mail: office@grampelhuber.at | www.grampelhuber.at

# Diamantbeschichtete VHM-Hochleistungsbohrer mit Innenkühlung für CFK/GFK – unidirektional – mit 90° Spitzwinkel vermeidet Delamination

29 0122

## Diamond coated solid carbide drill with interior cooling for CFRP/GFRP – unidirectional – with 90° tip angle, prevents delamination

GRAPHIT *graphite* | PVDF GF25
COMPO-SITES | ZIRKON OXID ZIRCONIA
CFK *CFRP* | FR 4
GFK *GFRP*
PEEK CF30
PEEK GF30
GF GF25







MICRO GRAIN | KARNASCH NORM
MF | DIN 6535 Form HAK
35° | 90°
Composites
DCC 0318
Air



Durch 2 Führungsphasen ist eine sehr hohe Präzision der Bohrungen möglich, bei gleichzeitiger Vermeidung von Delamination.

Our tip geometry allows for very high precision drilling of holes by avoiding delamination of material

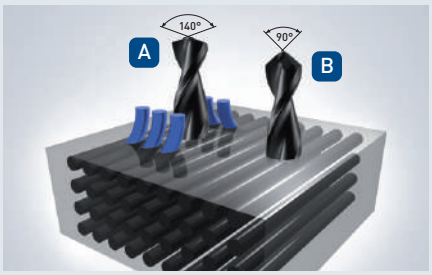
## Empfohlene Schnittdaten / Recommended cutting data

| Werkstoffgruppe Material group | WERKSTOFF WORKPIECE MATERIAL | vc m/min | f mm/U Ø 3,0 - 4,9 | Ø 5,0 - 7,9 | Ø 8,0 - 9,9 | Ø 10,0 - 12,0 |
|---|---|---|---|---|---|---|
| 8.3 | GFK / CFK Composites | 160 | 0,04 | 0,05 | 0,07 | 0,1 |

Schnittdaten Cutting data → 175
Zeichnungen Drawings → DXF/STEP




Faserverlauf in eine Richtung
Fibre progress in one direction




A Delamination und Gratbildung mit konventionellen Bohrern.

B Sauberer Bohrungsaustritt durch optimierte Führungsfase des Bohrwerkzeuges.

| Art. | d1 m7 | l3 | l2 | l1 | d2 h6 |
|---|---|---|---|---|---|
| 29 0122 0600 035 | % 6,00 | 35 | 44 | 82 | 6 |
| 29 0122 0610 043 | % 6,10 | 43 | 53 | 91 | 8 |
| 29 0122 0620 043 | % 6,20 | 43 | 53 | 91 | 8 |
| 29 0122 0630 043 | % 6,30 | 43 | 53 | 91 | 8 |
| 29 0122 0635 043 | % 6,350 1/4" | 43 | 53 | 91 | 8 |
| 29 0122 0640 043 | % 6,40 | 43 | 53 | 91 | 8 |
| 29 0122 0650 043 | % 6,50 | 43 | 53 | 91 | 8 |
| 29 0122 0660 043 | % 6,60 | 43 | 53 | 91 | 8 |
| 29 0122 0670 043 | % 6,70 | 43 | 53 | 91 | 8 |
| 29 0122 0680 043 | % 6,80 | 43 | 53 | 91 | 8 |
| 29 0122 0690 043 | % 6,90 | 43 | 53 | 91 | 8 |
| 29 0122 0700 043 | % 7,00 | 43 | 53 | 91 | 8 |
| 29 0122 0710 043 | % 7,10 | 43 | 53 | 91 | 8 |
| 29 0122 0730 043 | % 7,30 | 43 | 53 | 91 | 8 |
| 29 0122 0740 043 | % 7,40 | 43 | 53 | 91 | 8 |
| 29 0122 0750 043 | % 7,50 | 43 | 53 | 91 | 8 |
| 29 0122 0760 043 | % 7,60 | 43 | 53 | 91 | 8 |
| 29 0122 0770 043 | % 7,70 | 43 | 53 | 91 | 8 |
| 29 0122 0780 043 | % 7,80 | 43 | 53 | 91 | 8 |
| 29 0122 0790 043 | % 7,90 | 43 | 53 | 91 | 8 |
| 29 0122 07938 043 | % 7,938 5/16" | 43 | 53 | 91 | 8 |
| 29 0122 0800 043 | % 8,00 | 43 | 53 | 91 | 8 |
| 29 0122 0810 049 | % 8,10 | 49 | 61 | 103 | 10 |
| 29 0122 0820 049 | % 8,20 | 49 | 61 | 103 | 10 |
| 29 0122 0830 049 | % 8,30 | 49 | 61 | 103 | 10 |
| 29 0122 0840 049 | % 8,40 | 49 | 61 | 103 | 10 |
| 29 0122 0850 049 | % 8,50 | 49 | 61 | 103 | 10 |
| 29 0122 0860 049 | % 8,60 | 49 | 61 | 103 | 10 |
| 29 0122 0870 049 | % 8,70 | 49 | 61 | 103 | 10 |
| 29 0122 0880 049 | % 8,80 | 49 | 61 | 103 | 10 |
| 29 0122 0890 049 | % 8,90 | 49 | 61 | 103 | 10 |

| Art. | d1 m7 | l3 | l2 | l1 | d2 h6 |
|---|---|---|---|---|---|
| 29 0122 0900 049 | % 9,00 | 49 | 61 | 103 | 10 |
| 29 0122 0910 049 | % 9,10 | 49 | 61 | 103 | 10 |
| 29 0122 0920 049 | % 9,20 | 49 | 61 | 103 | 10 |
| 29 0122 0930 049 | % 9,30 | 49 | 61 | 103 | 10 |
| 29 0122 0940 049 | % 9,40 | 49 | 61 | 103 | 10 |
| 29 0122 0950 049 | % 9,50 | 49 | 61 | 103 | 10 |
| 29 0122 09525 049 | % 9,525 3/8" | 49 | 61 | 103 | 10 |
| 29 0122 0960 049 | % 9,60 | 49 | 61 | 103 | 10 |
| 29 0122 0970 049 | % 9,70 | 49 | 61 | 103 | 10 |
| 29 0122 0980 049 | % 9,80 | 49 | 61 | 103 | 10 |
| 29 0122 0990 049 | % 9,90 | 49 | 61 | 103 | 10 |
| 29 0122 1000 049 | % 10,00 | 49 | 61 | 103 | 10 |
| 29 0122 1010 056 | % 10,10 | 56 | 71 | 118 | 12 |
| 29 0122 1020 056 | % 10,20 | 56 | 71 | 118 | 12 |
| 29 0122 1030 056 | % 10,30 | 56 | 71 | 118 | 12 |
| 29 0122 1040 056 | % 10,40 | 56 | 71 | 118 | 12 |
| 29 0122 1050 056 | % 10,50 | 56 | 71 | 118 | 12 |
| 29 0122 1060 056 | % 10,60 | 56 | 71 | 118 | 12 |
| 29 0122 1070 056 | % 10,70 | 56 | 71 | 118 | 12 |
| 29 0122 1080 056 | % 10,80 | 56 | 71 | 118 | 12 |
| 29 0122 1090 056 | % 10,90 | 56 | 71 | 118 | 12 |
| 29 0122 1100 056 | % 11,00 | 56 | 71 | 118 | 12 |
| 29 0122 1111 056 | % 11,111 7/16" | 56 | 71 | 118 | 12 |
| 29 0122 1150 056 | % 11,50 | 56 | 71 | 118 | 12 |
| 29 0122 1180 056 | % 11,8 | 56 | 71 | 118 | 12 |
| 29 0122 1200 056 | % 12,0 | 56 | 71 | 118 | 12 |

% Sonderpreis / Sale Artikel. Lieferbar solange Vorrat.
Special price / sale article. While stocks last.



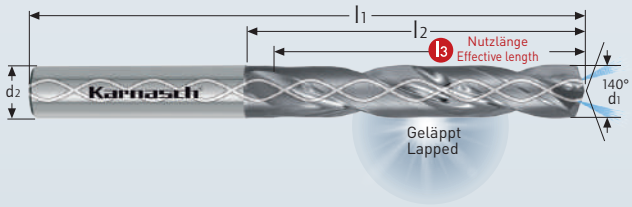


Grampelhuber GmbH | A-4810 Gmunden/Österreich | T: +43 (0)7612-64902-0 | F: +43 (0)7612-64902-8 | mail: office@grampelhuber.at | www.grampelhuber.at

# 22 0410

VHM-Hochleistungsbohrer mit Innenkühlung für INCONEL
Solid carbide high performance twist drill with interior cooling for INCONEL

INCONEL
HASTELLOY
MONEL
NIMONIC
NI-ALLOYS < 900 N/mm²
NI-CO ALLOYS > 900 N/mm²







MICRO GRAIN
DIN 6537 5xD
SPEZIAL SPECIAL
DIN 6535 Form HAK
30°
140°
HSC HPC
GELÄPPT LAPPED

## Empfohlene Schnittdaten / Recommended cutting data

| Werkstoffgruppe Material group | Werkstoff Material | Festigkeit Closeness | Schnittgeschwindigkeit Cutting speed Vc m/min | Vorschub pro Umdrehung Feed per revolution mm | | |
|---|---|---|---|---|---|---|
| | | | | Ø3 - Ø5 | Ø5 - Ø8 | Ø8 - Ø12 |
| 5.1<br>5.2<br>5.3 | Nickel 100%<br>Nickel-Legierung / Nickel alloy<br>Nickel-Legierung / Nickel alloy | <900 N/mm²<br>>900 N/mm² | 25-35 | 0,04 - 0,09 | 0,06 - 0,16 | 0,13 - 0,22 |

Schnittdaten Cutting data
176
Zeichnungen Drawings
DXF/STEP

| Art. | d1 h7 | l3 | l2 | l1 | d2 h6 |
|---|---|---|---|---|---|
| 22 0410 0300 023 | % 3,0 | 23 | 28 | 66 | 6 |
| 22 0410 0320 023 | % 3,2 | 23 | 28 | 66 | 6 |
| 22 0410 0330 023 | % 3,3 | 23 | 28 | 66 | 6 |
| 22 0410 0340 023 | % 3,4 | 23 | 28 | 66 | 6 |
| 22 0410 0350 023 | % 3,5 | 23 | 28 | 66 | 6 |
| 22 0410 0370 023 | % 3,7 | 23 | 28 | 66 | 6 |
| 22 0410 0380 029 | % 3,8 | 29 | 36 | 74 | 6 |
| 22 0410 0390 029 | % 3,9 | 29 | 36 | 74 | 6 |
| 22 0410 0400 029 | % 4,0 | 29 | 36 | 74 | 6 |
| 22 0410 0420 029 | % 4,2 | 29 | 36 | 74 | 6 |
| 22 0410 0430 029 | % 4,3 | 29 | 36 | 74 | 6 |
| 22 0410 0450 029 | % 4,5 | 29 | 36 | 74 | 6 |
| 22 0410 0465 029 | % 4,65 | 29 | 36 | 74 | 6 |
| 22 0410 0480 035 | % 4,8 | 35 | 44 | 82 | 6 |
| 22 0410 0500 035 | % 5,0 | 35 | 44 | 82 | 6 |
| 22 0410 0510 035 | % 5,1 | 35 | 44 | 82 | 6 |
| 22 0410 0520 035 | % 5,2 | 35 | 44 | 82 | 6 |
| 22 0410 0530 035 | % 5,3 | 35 | 44 | 82 | 6 |
| 22 0410 0540 035 | % 5,4 | 35 | 44 | 82 | 6 |
| 22 0410 0550 035 | % 5,5 | 35 | 44 | 82 | 6 |
| 22 0410 0555 035 | % 5,55 | 35 | 44 | 82 | 6 |
| 22 0410 0560 035 | % 5,6 | 35 | 44 | 82 | 6 |
| 22 0410 0570 035 | % 5,7 | 35 | 44 | 82 | 6 |
| 22 0410 0580 035 | % 5,8 | 35 | 44 | 82 | 6 |
| 22 0410 0600 035 | % 6,0 | 35 | 44 | 82 | 6 |
| 22 0410 0610 043 | % 6,1 | 43 | 53 | 91 | 8 |
| 22 0410 0620 043 | % 6,2 | 43 | 53 | 91 | 8 |
| 22 0410 0630 043 | % 6,3 | 43 | 53 | 91 | 8 |
| 22 0410 0640 043 | % 6,4 | 43 | 53 | 91 | 8 |
| 22 0410 0650 043 | % 6,5 | 43 | 53 | 91 | 8 |
| 22 0410 0660 043 | % 6,6 | 43 | 53 | 91 | 8 |
| 22 0410 0670 043 | % 6,7 | 43 | 53 | 91 | 8 |
| 22 0410 0680 043 | % 6,8 | 43 | 53 | 91 | 8 |
| 22 0410 0690 043 | % 6,9 | 43 | 53 | 91 | 8 |
| 22 0410 0700 043 | % 7,0 | 43 | 53 | 91 | 8 |
| 22 0410 0710 043 | % 7,1 | 43 | 53 | 91 | 8 |
| 22 0410 0720 043 | % 7,2 | 43 | 53 | 91 | 8 |
| 22 0410 0730 043 | % 7,3 | 43 | 53 | 91 | 8 |
| 22 0410 0740 043 | % 7,4 | 43 | 53 | 91 | 8 |
| 22 0410 0750 043 | % 7,5 | 43 | 53 | 91 | 8 |

| Art. | d1 h7 | l3 | l2 | l1 | d2 h6 |
|---|---|---|---|---|---|
| 22 0410 0760 043 | % 7,6 | 43 | 53 | 91 | 8 |
| 22 0410 0780 043 | % 7,8 | 43 | 53 | 91 | 8 |
| 22 0410 0790 043 | % 7,9 | 43 | 53 | 91 | 8 |
| 22 0410 0800 043 | % 8,0 | 43 | 53 | 91 | 8 |
| 22 0410 0810 049 | % 8,1 | 49 | 61 | 103 | 10 |
| 22 0410 0820 049 | % 8,2 | 49 | 61 | 103 | 10 |
| 22 0410 0830 049 | % 8,3 | 49 | 61 | 103 | 10 |
| 22 0410 0840 049 | % 8,4 | 49 | 61 | 103 | 10 |
| 22 0410 0850 049 | % 8,5 | 49 | 61 | 103 | 10 |
| 22 0410 0860 049 | % 8,6 | 49 | 61 | 103 | 10 |
| 22 0410 0870 049 | % 8,7 | 49 | 61 | 103 | 10 |
| 22 0410 0880 049 | % 8,8 | 49 | 61 | 103 | 10 |
| 22 0410 0890 049 | % 8,9 | 49 | 61 | 103 | 10 |
| 22 0410 0900 049 | % 9,0 | 49 | 61 | 103 | 10 |
| 22 0410 0910 049 | % 9,1 | 49 | 61 | 103 | 10 |
| 22 0410 0920 049 | % 9,2 | 49 | 61 | 103 | 10 |
| 22 0410 0930 049 | % 9,3 | 49 | 61 | 103 | 10 |
| 22 0410 0950 049 | % 9,5 | 49 | 61 | 103 | 10 |
| 22 0410 0960 049 | % 9,6 | 49 | 61 | 103 | 10 |
| 22 0410 0970 049 | % 9,7 | 49 | 61 | 103 | 10 |
| 22 0410 0980 049 | % 9,8 | 49 | 61 | 103 | 10 |
| 22 0410 1000 049 | % 10,0 | 49 | 61 | 103 | 10 |
| 22 0410 1010 056 | % 10,1 | 56 | 69 | 116 | 12 |
| 22 0410 1020 056 | % 10,2 | 56 | 69 | 116 | 12 |
| 22 0410 1030 056 | % 10,3 | 56 | 69 | 116 | 12 |
| 22 0410 1050 056 | % 10,5 | 56 | 69 | 116 | 12 |
| 22 0410 1060 056 | % 10,6 | 56 | 69 | 116 | 12 |
| 22 0410 1070 056 | % 10,7 | 56 | 69 | 116 | 12 |
| 22 0410 1080 056 | % 10,8 | 56 | 69 | 116 | 12 |
| 22 0410 1090 056 | % 10,9 | 56 | 69 | 116 | 12 |
| 22 0410 1100 056 | % 11,0 | 56 | 69 | 116 | 12 |
| 22 0410 1120 056 | % 11,2 | 56 | 69 | 116 | 12 |
| 22 0410 1150 056 | % 11,5 | 56 | 69 | 116 | 12 |
| 22 0410 1180 056 | % 11,8 | 56 | 69 | 116 | 12 |
| 22 0410 1200 056 | % 12,0 | 56 | 69 | 116 | 12 |

% Sonderpreis / Sale Artikel. Lieferbar solange Vorrat.
Special price / sale article. While stocks last.

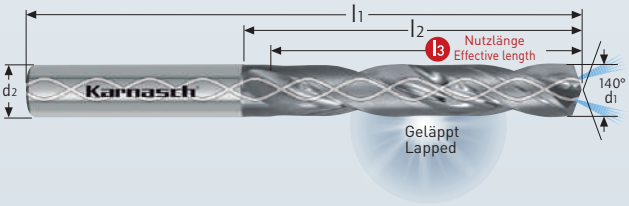


Grampelhuber GmbH | A-4810 Gmunden/Österreich | T: +43 (0)7612-64902-0 | F: +43 (0)7612-64902-8 | mail: office@grampelhuber.at | www.grampelhuber.at

VHM-Hochleistungsbohrer mit Innenkühlung für **TITAN**
Solid carbide high performance twist drill with interior cooling for **TITANIUM**

**22 0412**

TITAN titanium
TITAN titanium < 1200 N/mm²
TITAN GRADE 1 TITANIUM GRADE 1
TITAN GRADE 2 TITANIUM GRADE 2
TITAN GRADE 3 TITANIUM GRADE 3
TITAN GRADE 4 TITANIUM GRADE 4
TITAN GRADE 5 TITANIUM GRADE 5
TITAN GRADE 12 TITANIUM GRADE 12




MICRO GRAIN | DIN 6537 5xD
SPEZIAL SPECIAL | DIN 6535 Form HAK
30° | 140°
HSC HPC
GELÄPPT LAPPED

## Empfohlene Schnittdaten / Recommended cutting data

| Werkstoffgruppe Material group | Werkstoff Material | Festigkeit Closeness | Schnitt-geschwindigkeit Cutting speed Vc m/min | Vorschub pro Umdrehung Feed per revolution mm Ø3 - Ø5 | Ø5 - Ø8 | Ø8 - Ø12 |
|---|---|---|---|---|---|---|
| 4.1<br>4.2<br>4.3 | Reintitan / Pure Titanium<br>3.7105-3.7115-3.7124<br>3.7154-3.7164-3.7124 | <900 N/mm²<br>>900 N/mm² | 30-45 | 0,10 - 0,17 | 0,14 - 0,26 | 0,20 - 0,40 |

Schnittdaten Cutting data → 177
Zeichnungen Drawings → DXF/STEP

| Art. | d1 h7 | l3 | l2 | l1 | d2 h6 |
|---|---|---|---|---|---|
| 22 0412 0300 023 | % 3,0 | 23 | 28 | 66 | 6 |
| 22 0412 0320 023 | % 3,2 | 23 | 28 | 66 | 6 |
| 22 0412 0330 023 | % 3,3 | 23 | 28 | 66 | 6 |
| 22 0412 0340 023 | % 3,4 | 23 | 28 | 66 | 6 |
| 22 0412 0350 023 | % 3,5 | 23 | 28 | 66 | 6 |
| 22 0412 0370 023 | % 3,7 | 23 | 28 | 66 | 6 |
| 22 0412 0380 029 | % 3,8 | 29 | 36 | 74 | 6 |
| 22 0412 0390 029 | % 3,9 | 29 | 36 | 74 | 6 |
| 22 0412 0400 029 | % 4,0 | 29 | 36 | 74 | 6 |
| 22 0412 0420 029 | % 4,2 | 29 | 36 | 74 | 6 |
| 22 0412 0430 029 | % 4,3 | 29 | 36 | 74 | 6 |
| 22 0412 0450 029 | % 4,5 | 29 | 36 | 74 | 6 |
| 22 0412 0465 029 | % 4,65 | 29 | 36 | 74 | 6 |
| 22 0412 0480 035 | % 4,8 | 35 | 44 | 82 | 6 |
| 22 0412 0500 035 | % 5,0 | 35 | 44 | 82 | 6 |
| 22 0412 0510 035 | % 5,1 | 35 | 44 | 82 | 6 |
| 22 0412 0520 035 | % 5,2 | 35 | 44 | 82 | 6 |
| 22 0412 0530 035 | % 5,3 | 35 | 44 | 82 | 6 |
| 22 0412 0540 035 | % 5,4 | 35 | 44 | 82 | 6 |
| 22 0412 0550 035 | % 5,5 | 35 | 44 | 82 | 6 |
| 22 0412 0555 035 | % 5,55 | 35 | 44 | 82 | 6 |
| 22 0412 0560 035 | % 5,6 | 35 | 44 | 82 | 6 |
| 22 0412 0570 035 | % 5,7 | 35 | 44 | 82 | 6 |
| 22 0412 0580 035 | % 5,8 | 35 | 44 | 82 | 6 |
| 22 0412 0600 035 | % 6,0 | 35 | 44 | 82 | 6 |
| 22 0412 0610 043 | % 6,1 | 43 | 53 | 91 | 8 |
| 22 0412 0620 043 | % 6,2 | 43 | 53 | 91 | 8 |
| 22 0412 0630 043 | % 6,3 | 43 | 53 | 91 | 8 |
| 22 0412 0640 043 | % 6,4 | 43 | 53 | 91 | 8 |
| 22 0412 0650 043 | % 6,5 | 43 | 53 | 91 | 8 |
| 22 0412 0660 043 | % 6,6 | 43 | 53 | 91 | 8 |
| 22 0412 0670 043 | % 6,7 | 43 | 53 | 91 | 8 |
| 22 0412 0680 043 | % 6,8 | 43 | 53 | 91 | 8 |
| 22 0412 0690 043 | % 6,9 | 43 | 53 | 91 | 8 |
| 22 0412 0700 043 | % 7,0 | 43 | 53 | 91 | 8 |
| 22 0412 0710 043 | % 7,1 | 43 | 53 | 91 | 8 |
| 22 0412 0720 043 | % 7,2 | 43 | 53 | 91 | 8 |
| 22 0412 0730 043 | % 7,3 | 43 | 53 | 91 | 8 |
| 22 0412 0740 043 | % 7,4 | 43 | 53 | 91 | 8 |
| 22 0412 0750 043 | % 7,5 | 43 | 53 | 91 | 8 |

| Art. | d1 h7 | l3 | l2 | l1 | d2 h6 |
|---|---|---|---|---|---|
| 22 0412 0760 043 | % 7,6 | 43 | 53 | 91 | 8 |
| 22 0412 0780 043 | % 7,8 | 43 | 53 | 91 | 8 |
| 22 0412 0790 043 | % 7,9 | 43 | 53 | 91 | 8 |
| 22 0412 0800 043 | % 8,0 | 43 | 53 | 91 | 8 |
| 22 0412 0810 049 | % 8,1 | 49 | 61 | 103 | 10 |
| 22 0412 0820 049 | % 8,2 | 49 | 61 | 103 | 10 |
| 22 0412 0830 049 | % 8,3 | 49 | 61 | 103 | 10 |
| 22 0412 0840 049 | % 8,4 | 49 | 61 | 103 | 10 |
| 22 0412 0850 049 | % 8,5 | 49 | 61 | 103 | 10 |
| 22 0412 0860 049 | % 8,6 | 49 | 61 | 103 | 10 |
| 22 0412 0870 049 | % 8,7 | 49 | 61 | 103 | 10 |
| 22 0412 0880 049 | % 8,8 | 49 | 61 | 103 | 10 |
| 22 0412 0890 049 | % 8,9 | 49 | 61 | 103 | 10 |
| 22 0412 0900 049 | % 9,0 | 49 | 61 | 103 | 10 |
| 22 0412 0910 049 | % 9,1 | 49 | 61 | 103 | 10 |
| 22 0412 0920 049 | % 9,2 | 49 | 61 | 103 | 10 |
| 22 0412 0930 049 | % 9,3 | 49 | 61 | 103 | 10 |
| 22 0412 0950 049 | % 9,5 | 49 | 61 | 103 | 10 |
| 22 0412 0960 049 | % 9,6 | 49 | 61 | 103 | 10 |
| 22 0412 0970 049 | % 9,7 | 49 | 61 | 103 | 10 |
| 22 0412 0980 049 | % 9,8 | 49 | 61 | 103 | 10 |
| 22 0412 1000 049 | % 10,0 | 49 | 61 | 103 | 10 |
| 22 0412 1010 056 | % 10,1 | 56 | 69 | 116 | 12 |
| 22 0412 1020 056 | % 10,2 | 56 | 69 | 116 | 12 |
| 22 0412 1030 056 | % 10,3 | 56 | 69 | 116 | 12 |
| 22 0412 1050 056 | % 10,5 | 56 | 69 | 116 | 12 |
| 22 0412 1060 056 | % 10,6 | 56 | 69 | 116 | 12 |
| 22 0412 1070 056 | % 10,7 | 56 | 69 | 116 | 12 |
| 22 0412 1080 056 | % 10,8 | 56 | 69 | 116 | 12 |
| 22 0412 1090 056 | % 10,9 | 56 | 69 | 116 | 12 |
| 22 0412 1100 056 | % 11,0 | 56 | 69 | 116 | 12 |
| 22 0412 1120 056 | % 11,2 | 56 | 69 | 116 | 12 |
| 22 0412 1150 056 | % 11,5 | 56 | 69 | 116 | 12 |
| 22 0412 1180 056 | % 11,8 | 56 | 69 | 116 | 12 |
| 22 0412 1200 056 | % 12,0 | 56 | 69 | 116 | 12 |

% Sonderpreis / Sale Artikel. Lieferbar solange Vorrat.
Special price / sale article. While stocks last.

1 2 3 4 5 6 7 MACHINES 8 OIL 9 10 Index

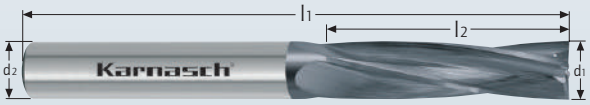


Grampelhuber GmbH | A-4810 Gmunden/Österreich | T: +43 (0)7612-64902-0 | F: +43 (0)7612-64902-8 | mail: office@grampelhuber.at | www.grampelhuber.at

## 29 0305 EXPERT ★★★

Diamantbeschichteter Vollhartmetall Schlichtfräser "UGT"
Diamond coated solid carbide finishing cutter, "UGT"

COMPO-SITES | AFK Aramid
GFK GFRP | GRAPHIT graphite
CFK CFRP | FR 4







MICRO GRAIN | KARNASCH NORM
SPEZIAL SPECIAL | DIN 6535 Form HA
15°
HSC HPC
DCA-06 PLUS
Air

| Empfohlene Schnittdaten Recommended cutting data | GFK GFRP | CFK CFRP |
|---|---|---|
| Vc m/min. | 100-180 | 100-180 |
| f/U mm | 0,3-0,5 | 0,2-0,4 |

Optimale Bearbeitungsdaten müssen während der Einlaufphase ermittelt werden.
Optimal machining data must be determined during the run in phase.

| Art. | d1 | l2 | d2 | l1 | Z |
|---|---|---|---|---|---|
| 29 0305 0300 10 04 | • 3,0 | 10 | 4 | 40 | 4 |
| 29 0305 0400 15 04 | • 4,0 | 15 | 6 | 50 | 4 |
| 29 0305 0500 15 04 | • 5,0 | 15 | 6 | 50 | 4 |
| 29 0305 0600 15 04 | • 6,0 | 15 | 6 | 50 | 4 |
| 29 0305 0600 25 04 | • 6,0 | 25 | 6 | 64 | 4 |
| 29 0305 0635 26 04 | • 6,35 | 26 | 6,35 | 64 | 4 |
| 29 0305 0800 15 04 | • 8,0 | 15 | 8 | 60 | 4 |
| 29 0305 0800 30 04 | • 8,0 | 30 | 8 | 76 | 4 |
| 29 0305 0953 30 04 | • 9,53 | 30 | 9,53 | 64 | 4 |
| 29 0305 1000 20 04 | • 10,0 | 20 | 10 | 73 | 4 |
| 29 0305 1000 40 04 | • 10,0 | 40 | 10 | 93 | 4 |
| 29 0305 1200 20 04 | • 12,0 | 20 | 12 | 73 | 4 |
| 29 0305 1200 40 04 | • 12,0 | 40 | 12 | 96 | 4 |
| 29 0305 2000 20 04 | % 20,0 | 20 | 20 | 80 | 4 |
| 29 0305 2000 20 08 | % 20,0 | 20 | 20 | 80 | 8 |
| 29 0305 2000 42 08 | % 20,0 | 42 | 20 | 105 | 8 |

% Sonderpreis / Sale Artikel. Lieferbar solange Vorrat.
Special price / sale article. While stocks last.

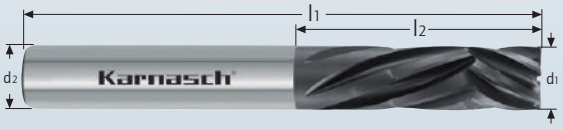
Schnittdaten Cutting data | Zeichnungen Drawings
178 | DXF/STEP

## 29 0412

Diamantbeschichteter Vollhartmetall Typ „V" Fräser für gratfreies Fräsen an Ober- und Unterkante von faserverstärkten Kunststoffen

Diamond coated solid carbide type "V" end mill for burr-free milling of upper and lower edge of fibre-reinforced plastics

COMPO-SITES | PEEK CF30
GFK GFRP | Honey comb
PVDF GF25
POM GF25
PA-66
CFK CFRP
PEEK GF30
PTFE CF25







MICRO GRAIN | KARNASCH NORM
SPEZIAL SPECIAL | DIN 6535 Form HA
HPC
DCC031 impuls
Air

| | |
|---|---|
| d1* = Ø 6,0 | tol -0,000 / -0,048 |
| d1* = Ø 8,0 - Ø 10,0 | tol -0,000 / -0,058 |
| d1* = Ø 12,0 - Ø 16,0 | tol -0,000 / -0,070 |




Die gleichzeitig ziehende und schiebende Anordnung der Schneiden verhindert Delamination.

Concurrent drawing and pushing blade alignment prevents delamination.

| Art. | d1* | l2 | d2 h5 | l1 | Z |
|---|---|---|---|---|---|
| 29 0412 0800 22 | % 8 | 22 | 8 | 70 | 6 |
| 29 0412 0800 28 | % 8 | 28 | 8 | 85 | 6 |
| 29 0412 1000 25 | % 10 | 25 | 10 | 72 | 6 |
| 29 0412 1200 28 | % 12 | 28 | 12 | 85 | 6 |
| 29 0412 1200 36 | % 12 | 36 | 12 | 92 | 6 |
| 29 0412 1600 35 | % 16 | 35 | 16 | 92 | 6 |
| 29 0412 1600 48 | % 16 | 48 | 16 | 110 | 6 |

% Sonderpreis / Sale Artikel. Lieferbar solange Vorrat.
Special price / sale article. While stocks last.

Schnittdaten Cutting data | Zeichnungen Drawings
1412 | DXF/STEP



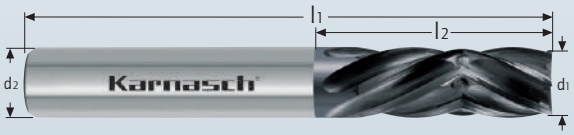
Grampelhuber GmbH | A-4810 Gmunden/Österreich | T: +43 (0)7612-64902-0 | F: +43 (0)7612-64902-8 | mail: office@grampelhuber.at | www.grampelhuber.at

## Diamantbeschichteter Vollhartmetall Typ „VR“ Fräser für gratfreies Fräsen an Ober- und Unterkante von faserverstärkten Kunststoffen ohne Innenkühlung

29 0416

## Diamond coated solid carbide type "VR" end mill for burr-free milling upper and lower edges in fibre-reinforced plastics without inner cooling

COMPO-SITES | CFK *CFRP*
GFK *GFRP* | PEEK GF30
PVDF GF25 | PTFE CF25
POM GF25 | PEEK CF30
PA-66 | Honey comb







| | |
|---|---|
| d1* = Ø 6,0 | tol -0,000 / -0,048 |
| d1* = Ø 8,0 - Ø 10,0 | tol -0,000 / -0,058 |
| d1* = Ø 12,0 | tol -0,000 / -0,070 |




Die gleichzeitig ziehende und schiebende Anordnung der Schneiden verhindert Delamination.

Concurrent drawing and pushing blade alignment prevents delamination.

MICRO GRAIN | KARNASCH NORM
SPEZIAL SPECIAL | DIN 6535 Form HA
HPC
DCC031 impulse
Air

Schnittdaten Cutting data | Zeichnungen Drawings
1412 | DXF/STEP

| Art. | d1* | l2 | d2 h5 | l1 | Z |
|---|---|---|---|---|---|
| 29 0416 0600 16 | % 6 | 16 | 6 | 58 | 4 |
| 29 0416 0800 22 | % 8 | 22 | 8 | 70 | 6 |
| 29 0416 1000 25 | % 10 | 25 | 10 | 72 | 6 |
| 29 0416 1200 28 | % 12 | 28 | 12 | 85 | 6 |

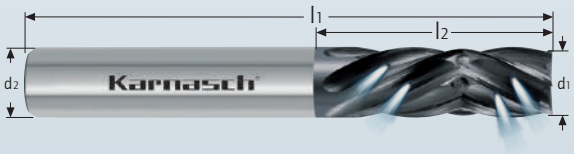
% Sonderpreis / Sale Artikel. Lieferbar solange Vorrat.
Special price / sale article. While stocks last.

## Diamantbeschichteter Vollhartmetall Typ „VRK“ Fräser für gratfreies Fräsen an Ober- und Unterkante von faserverstärkten Kunststoffen mit Innenkühlung

29 0417

## Diamond coated solid carbide type "VRK" end mill for burr-free milling upper and lower edges in fibre-reinforced plastics with inner cooling

COMPO-SITES | CFK *CFRP*
GFK *GFRP* | PEEK GF30
PVDF GF25 | PTFE CF25
POM GF25 | PEEK CF30
PA-66 | Honey comb







| | |
|---|---|
| d1* = Ø 6,0 | tol -0,000 / -0,048 |
| d1* = Ø 8,0 - Ø 10,0 | tol -0,000 / -0,058 |
| d1* = Ø 12,0 | tol -0,000 / -0,070 |




Die gleichzeitig ziehende und schiebende Anordnung der Schneiden verhindert Delamination.

Concurrent drawing and pushing blade alignment prevents delamination.

MICRO GRAIN | KARNASCH NORM
SPEZIAL SPECIAL | DIN 6535 Form HAK
HPC
DCC031 impulse
OIL | Emul | MMKS | AIR

Schnittdaten Cutting data | Zeichnungen Drawings
1412 | DXF/STEP

| Art. | d1* | l2 | d2 h5 | l1 | Z |
|---|---|---|---|---|---|
| 29 0417 0600 16 | % 6 | 16 | 6 | 58 | 4 |
| 29 0417 0800 22 | % 8 | 22 | 8 | 70 | 6 |
| 29 0417 1000 25 | % 10 | 25 | 10 | 72 | 6 |
| 29 0417 1200 28 | % 12 | 28 | 12 | 85 | 6 |

% Sonderpreis / Sale Artikel. Lieferbar solange Vorrat.
Special price / sale article. While stocks last.

# 29 1652

Vollhartmetall Einzahnfräser, rechtsspirale – rechtsschneidend, ziehender Schnitt
Solid carbide one-tooth end mill, right spiral – right cutting, drawing cut (upcut)

Acryl Acrylic
PMMA GS
PE PP
PA
SAN
ABS
PC PET PPE
PMMA XT
MAKROLON
Wachs Wax




MICRO GRAIN
KARNASCH NORM
SPEZIAL SPECIAL
DIN 6535 Form HA
30°
HSC High-Speed-Cutting
GELÄPPT LAPPED
Air

| | | |
|---|---|---|
| d1* | = Ø ≤ 3,0 | tol -0,000 / -0,040 |
| d1* | = Ø 4,0 - Ø 6,0 | tol -0,000 / -0,048 |
| d1* | = Ø 8,0 - Ø 10,0 | tol -0,000 / -0,058 |

| Art. | d1* | l2 | d2 h6 | l1 | Z |
|---|---|---|---|---|---|
| 29 1652 0010 003 03 030 | • 0,10 | 0,3 | 3 | 30 | 1 |
| 29 1652 0020 006 03 030 | • 0,20 | 0,6 | 3 | 30 | 1 |
| 29 1652 0030 010 03 030 | • 0,30 | 1,0 | 3 | 30 | 1 |
| 29 1652 0040 010 03 030 | • 0,40 | 1,0 | 3 | 30 | 1 |
| 29 1652 0050 015 03 030 | • 0,50 | 1,5 | 3 | 30 | 1 |
| 29 1652 0060 030 03 030 | • 0,60 | 3,0 | 3 | 30 | 1 |
| 29 1652 0080 050 03 030 | • 0,80 | 5,0 | 3 | 30 | 1 |
| 29 1652 0100 040 03 030 | • 1,00 | 4,0 | 3 | 30 | 1 |
| 29 1652 0150 060 03 030 | • 1,50 | 6,0 | 3 | 30 | 1 |
| 29 1652 0200 060 03 030 | • 2,00 | 6,0 | 3 | 30 | 1 |
| 29 1652 0200 060 04 050 | • 2,00 | 6,0 | 4 | 50 | 1 |
| 29 1652 0200 060 06 050 | • 2,00 | 6,0 | 6 | 50 | 1 |
| 29 1652 0200 080 03 030 | • 2,00 | 8,0 | 3 | 30 | 1 |
| 29 1652 0200 110 03 038 | • 2,00 | 11,0 | 3 | 38 | 1 |
| 29 1652 0300 060 03 030 | • 3,00 | 6,0 | 3 | 30 | 1 |
| 29 1652 0300 060 06 050 | • 3,00 | 6,0 | 6 | 50 | 1 |
| 29 1652 0300 110 03 038 | • 3,00 | 11,0 | 3 | 38 | 1 |
| 29 1652 0300 110 04 050 | • 3,00 | 11,0 | 4 | 50 | 1 |
| 29 1652 0300 110 06 050 | • 3,00 | 11,0 | 6 | 50 | 1 |
| 29 1652 0300 220 03 050 | • 3,00 | 22,0 | 3 | 50 | 1 |
| 29 1652 0300 220 06 060 | • 3,00 | 22,0 | 6 | 60 | 1 |
| 29 1652 0400 080 04 050 | • 4,00 | 8,0 | 4 | 50 | 1 |
| 29 1652 0400 080 06 050 | • 4,00 | 8,0 | 6 | 50 | 1 |
| 29 1652 0400 120 04 050 | • 4,00 | 12,0 | 4 | 50 | 1 |
| 29 1652 0400 120 06 050 | • 4,00 | 12,0 | 6 | 50 | 1 |
| 29 1652 0400 140 04 050 | • 4,00 | 14,0 | 4 | 50 | 1 |
| 29 1652 0400 140 06 050 | • 4,00 | 14,0 | 6 | 50 | 1 |
| 29 1652 0400 220 04 050 | • 4,00 | 22,0 | 4 | 50 | 1 |
| 29 1652 0400 220 06 050 | • 4,00 | 22,0 | 6 | 50 | 1 |
| 29 1652 0400 320 04 064 | • 4,00 | 32,0 | 4 | 64 | 1 |
| 29 1652 0500 120 06 050 | • 5,00 | 12,0 | 6 | 50 | 1 |
| 29 1652 0500 160 06 050 | • 5,00 | 16,0 | 6 | 50 | 1 |
| 29 1652 0500 220 06 050 | • 5,00 | 22,0 | 6 | 50 | 1 |
| 29 1652 0600 120 06 050 | • 6,00 | 12,0 | 6 | 50 | 1 |
| 29 1652 0600 220 06 050 | • 6,00 | 22,0 | 6 | 50 | 1 |
| 29 1652 0600 220 06 058 | • 6,00 | 22,0 | 6 | 58 | 1 |
| 29 1652 0600 320 06 064 | • 6,00 | 32,0 | 6 | 64 | 1 |
| 29 1652 0600 420 06 075 | • 6,00 | 42,0 | 6 | 75 | 1 |
| 29 1652 0600 320 06 100 | • 6,00 | 32,0 | 6 | 100 | 1 |
| 29 1652 0800 220 08 064 | • 8,00 | 22,0 | 8 | 64 | 1 |
| 29 1652 0800 320 08 064 | • 8,00 | 32,0 | 8 | 64 | 1 |
| 29 1652 0800 420 08 075 | • 8,00 | 42,0 | 8 | 75 | 1 |
| 29 1652 0800 420 08 100 | • 8,00 | 42,0 | 8 | 100 | 1 |
| 29 1652 0800 550 08 100 | • 8,00 | 55,0 | 8 | 100 | 1 |
| 29 1652 1000 220 10 064 | • 10,00 | 22,0 | 10 | 64 | 1 |
| 29 1652 1000 320 10 075 | • 10,00 | 32,0 | 10 | 75 | 1 |
| 29 1652 1000 550 10 100 | • 10,00 | 55,0 | 10 | 100 | 1 |
| 29 1652 1000 750 10 120 | • 10,00 | 75,0 | 10 | 120 | 1 |

Schnittdaten Cutting data
1408-1409
Zeichnungen Drawings
DXF/STEP

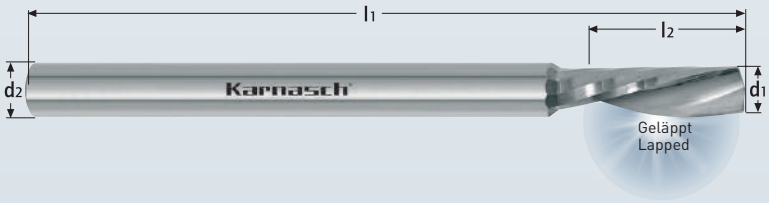


Grampelhuber GmbH | A-4810 Gmunden/Österreich | T: +43 (0)7612-64902-0 | F: +43 (0)7612-64902-8 | mail: office@grampelhuber.at | www.grampelhuber.at

Vollhartmetall Einzahnfräser, linksspirale – rechtsschneidend, schiebender Schnitt
Solid carbide one-tooth end mill, left spiral – right cutting, pushing cut (down cut)

29 1654

Acryl Acrylic
PMMA GS
PE PP
PA
SAN
ABS
PC PET PPE
PMMA XT
MAKROLON
Wachs Wax




MICRO GRAIN
KARNASCH NORM
SPEZIAL SPECIAL
DIN 6535 Form HA
L-R 30°
HSC High-Speed-Cutting
GELÄPPT LAPPED
Air

| | |
|---|---|
| d1* = Ø ≤ 3,0 | tol -0,000 / -0,040 |
| d1* = Ø 4,0 - Ø 6,0 | tol -0,000 / -0,048 |
| d1* = Ø 8,0 - Ø 10,0 | tol -0,000 / -0,058 |

Schnittdaten Cutting data 1408-1409
Zeichnungen Drawings DXF/STEP

| Art. | | d1* | l2 | d2 h6 | l3 | l1 | Z |
|---|---|---|---|---|---|---|---|
| 29 1654 0100 04 03 040 | • | 1,0 | 4 | 3 | – | 40 | 1 |
| 29 1654 0150 06 03 040 | • | 1,5 | 6 | 3 | – | 40 | 1 |
| 29 1654 0200 03 03 050 | • | 2,0 | 3 | 3 | – | 50 | 1 |
| 29 1654 0200 06 06 050 | • | 2,0 | 6 | 6 | – | 50 | 1 |
| 29 1654 0200 08 03 040 | • | 2,0 | 8 | 3 | – | 40 | 1 |
| 29 1654 0300 04 03 050 | • | 3,0 | 4 | 3 | – | 50 | 1 |
| 29 1654 0300 06 03 050 | • | 3,0 | 6 | 3 | – | 50 | 1 |
| 29 1654 0300 10 03 030 | • | 3,0 | 10 | 3 | – | 30 | 1 |
| 29 1654 0300 10 03 060 | • | 3,0 | 10 | 3 | – | 60 | 1 |
| 29 1654 0300 12 06 050 | • | 3,0 | 12 | 6 | – | 50 | 1 |
| 29 1654 0300 15 08 075 | • | 3,0 | 15 | 8 | – | 75 | 1 |
| 29 1654 0300 18 08 100 | • | 3,0 | 18 | 8 | – | 100 | 1 |
| 29 1654 0400 05 04 050 | • | 4,0 | 5 | 4 | – | 50 | 1 |
| 29 1654 0400 08 04 040 | • | 4,0 | 8 | 4 | – | 40 | 1 |
| 29 1654 0400 14 06 050 | • | 4,0 | 14 | 6 | – | 50 | 1 |
| 29 1654 0400 18 08 075 | • | 4,0 | 18 | 8 | – | 75 | 1 |
| 29 1654 0400 20 04 060 | • | 4,0 | 20 | 4 | – | 60 | 1 |
| 29 1654 0400 22 08 100 | • | 4,0 | 22 | 8 | – | 100 | 1 |
| 29 1654 0500 06 06 050 | • | 5,0 | 6 | 6 | – | 50 | 1 |
| 29 1654 0500 10 06 040 | • | 5,0 | 10 | 6 | – | 40 | 1 |
| 29 1654 0500 16 06 050 | • | 5,0 | 16 | 6 | – | 50 | 1 |
| 29 1654 0500 22 06 060 | • | 5,0 | 22 | 6 | – | 60 | 1 |
| 29 1654 0500 25 08 075 | • | 5,0 | 25 | 8 | – | 75 | 1 |
| 29 1654 0500 25 08 100 | • | 5,0 | 25 | 8 | – | 100 | 1 |
| 29 1654 0500 30 06 070 | • | 5,0 | 30 | 6 | – | 70 | 1 |
| 29 1654 0600 07 06 050 | • | 6,0 | 7 | 6 | – | 50 | 1 |
| 29 1654 0600 18 06 050 | • | 6,0 | 18 | 6 | – | 50 | 1 |
| 29 1654 0600 20 06 060 | • | 6,0 | 20 | 6 | – | 60 | 1 |
| 29 1654 0600 20 06 100 | • | 6,0 | 20 | 6 | 40 | 100 | 1 |
| 29 1654 0600 25 06 065 | • | 6,0 | 25 | 6 | – | 65 | 1 |
| 29 1654 0600 25 08 075 | • | 6,0 | 25 | 8 | – | 75 | 1 |
| 29 1654 0600 40 06 080 | • | 6,0 | 40 | 6 | – | 80 | 1 |
| 29 1654 0600 30 08 100 | • | 6,0 | 30 | 8 | – | 100 | 1 |
| 29 1654 0800 10 08 050 | • | 8,0 | 10 | 8 | – | 50 | 1 |
| 29 1654 0800 20 08 050 | • | 8,0 | 20 | 8 | – | 50 | 1 |
| 29 1654 0800 20 08 060 | • | 8,0 | 20 | 8 | – | 60 | 1 |
| 29 1654 0800 20 08 100 | • | 8,0 | 20 | 8 | 40 | 100 | 1 |
| 29 1654 0800 35 08 100 | • | 8,0 | 35 | 8 | – | 100 | 1 |
| 29 1654 1000 25 10 070 | • | 10,0 | 25 | 10 | – | 70 | 1 |
| 29 1654 1000 25 10 120 | • | 10,0 | 25 | 10 | 50 | 120 | 1 |
| 29 1654 1000 32 | % | 10,0 | 32 | 10 | – | 75 | 1 |
| 29 1654 1000 35 10 090 | • | 10,0 | 35 | 10 | – | 90 | 1 |

% Sonderpreis / Sale Artikel. Lieferbar solange Vorrat.
Special price / sale article. While stocks last.



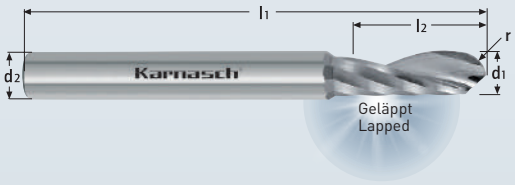


Grampelhuber GmbH | A-4810 Gmunden/Österreich | T: +43 (0)7612-64902-0 | F: +43 (0)7612-64902-8 | mail: office@grampelhuber.at | www.grampelhuber.at

# 29 1658

Vollhartmetall Einzahnfräser mit Radius, rechtsspirale – rechtsschneidend, Hochglanz-finish
Solid carbide one-tooth end mill with corner radius, right spiral – right cutting, mirror finish

Acryl
Acrylic
PMMA GS
PE PP
PA
SAN
ABS
PC PET PPE
PMMA XT
MAKROLON
Wachs Wax







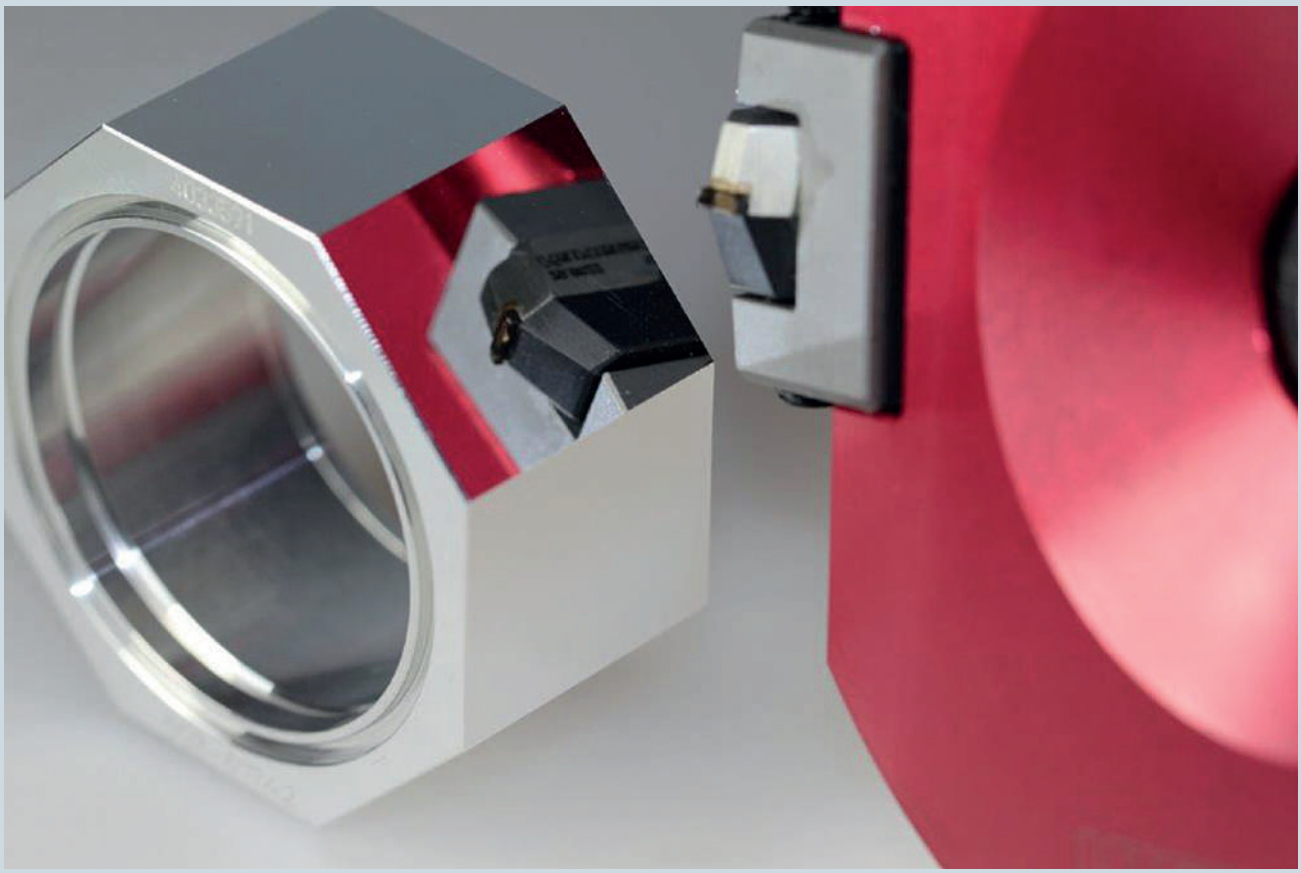
MICRO GRAIN
KARNASCH NORM
SPEZIAL SPECIAL
DIN 6535 Form HA
30°
Z=1 r
HSC High-Speed-Cutting
GELÄPPT LAPPED
Air

| Art. | d1 | r | l2 | d2 h5 | l1 |
|---|---|---|---|---|---|
| 29 1658 0200 06 | % 2 | 1,0 | 6 | 6 | 60 |
| 29 1658 0300 09 | % 3 | 1,5 | 9 | 6 | 60 |
| 29 1658 0400 12 | % 4 | 2,0 | 12 | 6 | 60 |
| 29 1658 0500 15 | % 5 | 2,5 | 15 | 6 | 60 |
| 29 1658 0800 24 | % 8 | 4,0 | 24 | 8 | 80 |
| 29 1658 1000 30 | % 10 | 5,0 | 30 | 10 | 80 |

Technik: Keine Schartigkeit bei 50-facher Vergrößerung (< Rz 0,5)
Technology: No chipping at 50-times magnification (< Rz 0,5)
% Sonderpreis / Sale Artikel. Lieferbar solange Vorrat.
Special price / sale article. While stocks last.

Schnittdaten Cutting data
1407
Zeichnungen Drawings
DXF/STEP

MKD Hochglanz Messerkopf 29 6620 Seite 195
MCD mirror finish cutter head 29 6620 page 195



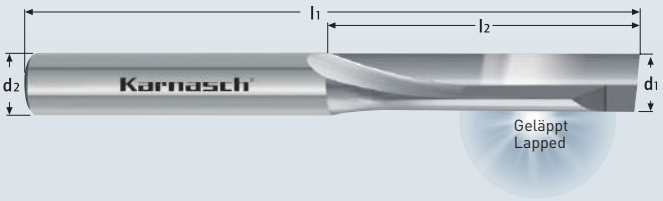


Grampelhuber GmbH | A-4810 Gmunden/Österreich | T: +43 (0)7612-64902-0 | F: +43 (0)7612-64902-8 | mail: office@grampelhuber.at | www.grampelhuber.at

Vollhartmetall Einzahnfräser, gerade genutet, rechtsschneidend
Solid carbide one-tooth end mill, straight fluted – right cutting

29 1661

Acryl
Acrylic
PMMA GS
PE PP
PA
SAN
ABS
PC PET PPE
PMMA XT
MAKROLON
Wachs Wax




MICRO GRAIN
KARNASCH NORM
SPEZIAL SPECIAL
DIN 6535 Form HA
0°
HSC High-Speed-Cutting
GELÄPPT LAPPED
Air

| | |
|---|---|
| d1* = Ø ≤ 3,0 | tol -0,000 / -0,040 |
| d1* = Ø 4,0 - Ø 6,0 | tol -0,000 / -0,048 |
| d1* = Ø 8,0 - Ø 10,0 | tol -0,000 / -0,058 |

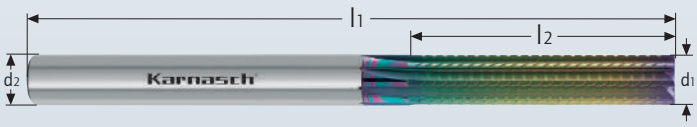
Schnittdaten Cutting data
1408-1409
Zeichnungen Drawings
DXF/STEP

| Art. | | d1* | l2 | d2 h6 | l1 |
|---|---|---|---|---|---|
| 29 1661 0100 04 040 | • | 1,0 | 4 | 3 | 40 |
| 29 1661 0150 06 040 | • | 1,5 | 6 | 3 | 40 |
| 29 1661 0200 03 050 | • | 2,0 | 3 | 3 | 50 |
| 29 1661 0200 06 050 | • | 2,0 | 6 | 6 | 50 |
| 29 1661 0200 08 040 | • | 2,0 | 8 | 3 | 40 |
| 29 1661 0250 09 040 | • | 2,5 | 9 | 3 | 40 |
| 29 1661 0300 06 040 | • | 3,0 | 6 | 3 | 40 |
| 29 1661 0300 10 030 | • | 3,0 | 10 | 3 | 30 |
| 29 1661 0300 10 060 | • | 3,0 | 10 | 3 | 60 |
| 29 1661 0300 12 050 | • | 3,0 | 12 | 6 | 50 |
| 29 1661 0300 15 075 | • | 3,0 | 15 | 8 | 75 |
| 29 1661 0300 18 100 | • | 3,0 | 18 | 8 | 100 |
| 29 1661 0400 05 050 | • | 4,0 | 5 | 4 | 50 |
| 29 1661 0400 08 040 | • | 4,0 | 8 | 4 | 40 |
| 29 1661 0400 14 050 | • | 4,0 | 14 | 6 | 50 |
| 29 1661 0400 18 075 | • | 4,0 | 18 | 8 | 75 |
| 29 1661 0400 20 060 | • | 4,0 | 20 | 4 | 60 |
| 29 1661 0400 22 100 | • | 4,0 | 22 | 8 | 100 |
| 29 1661 0400 30 070 | • | 4,0 | 30 | 4 | 70 |
| 29 1661 0500 06 050 | • | 5,0 | 6 | 5 | 50 |
| 29 1661 0500 10 040 | • | 5,0 | 10 | 5 | 40 |
| 29 1661 0500 16 050 | • | 5,0 | 16 | 6 | 50 |
| 29 1661 0500 22 060 | • | 5,0 | 22 | 5 | 60 |
| 29 1661 0500 25 075 | • | 5,0 | 25 | 8 | 75 |
| 29 1661 0500 25 100 | • | 5,0 | 25 | 8 | 100 |
| 29 1661 0500 30 070 | • | 5,0 | 30 | 5 | 70 |
| 29 1661 0600 07 050 | • | 6,0 | 7 | 6 | 50 |
| 29 1661 0600 18 050 | • | 6,0 | 18 | 6 | 50 |
| 29 1661 0600 20 060 | • | 6,0 | 20 | 6 | 60 |
| 29 1661 0600 25 065 | • | 6,0 | 25 | 6 | 65 |
| 29 1661 0600 25 075 | • | 6,0 | 25 | 8 | 75 |
| 29 1661 0600 30 100 | • | 6,0 | 30 | 8 | 100 |
| 29 1661 0600 40 080 | • | 6,0 | 40 | 6 | 80 |
| 29 1661 0800 09 050 | • | 8,0 | 9 | 8 | 50 |
| 29 1661 0800 20 050 | • | 8,0 | 20 | 8 | 50 |
| 29 1661 0800 20 060 | • | 8,0 | 20 | 8 | 60 |
| 29 1661 0800 30 075 | • | 8,0 | 30 | 8 | 75 |
| 29 1661 0800 35 100 | • | 8,0 | 35 | 8 | 100 |
| 29 1661 1000 25 070 | • | 10,0 | 25 | 10 | 70 |
| 29 1661 1000 35 090 | • | 10,0 | 35 | 10 | 90 |

## 29 1751

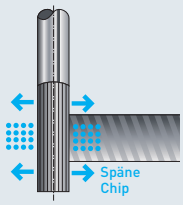
Vollhartmetall-Schrupp- und Schlichtfräser, 8 Frässchneiden / gerade Verzahnung
Solid carbide roughing and finishing cutter for CFRP / GFRP, 8 milling blades / straight teeth

COMPO-SITES | PA PE PI | PTFE FEP PVDF | ALUMINIUM non-ferrous | PA | Kupfer copper | PA-66 | PE PP | PMMA GS | PMMA XT | SAN | Honey comb




| | |
|---|---|
| d1* = Ø 4,0 - Ø 6,0 | tol -0,000 / -0,048 |
| d1* = Ø 8,0 - Ø 10,0 | tol -0,000 / -0,058 |
| d1* = Ø 12,0 - Ø 16,0 | tol -0,000 / -0,070 |
| d1* = Ø 20,0 | tol -0,000 / -0,084 |

| Art. | d1* | l2 | d2 h6 | l1 | Z |
|---|---|---|---|---|---|
| 29 1751 0400 16 | • 4 | 16 | 6 | 60 | 8 |
| 29 1751 0500 18 | • 5 | 18 | 6 | 60 | 8 |
| 29 1751 0600 20 | • 6 | 20 | 6 | 60 | 8 |
| 29 1751 0600 25 | • 6 | 25 | 6 | 65 | 8 |
| 29 1751 0600 30 | • 6 | 30 | 6 | 75 | 8 |
| 29 1751 0600 50 | • 6 | 50 | 6 | 100 | 8 |
| 29 1751 0800 22 | • 8 | 22 | 8 | 63 | 8 |
| 29 1751 0800 32 | • 8 | 32 | 8 | 75 | 8 |
| 29 1751 0800 50 | • 8 | 50 | 8 | 100 | 8 |
| 29 1751 1000 32 | • 10 | 32 | 10 | 72 | 8 |
| 29 1751 1000 60 | • 10 | 60 | 10 | 120 | 8 |
| 29 1751 1200 32 | • 12 | 32 | 12 | 82 | 8 |
| 29 1751 1200 70 | • 12 | 70 | 12 | 120 | 8 |
| 29 1751 1600 36 | % 16 | 36 | 16 | 92 | 8 |
| 29 1751 1600 80 | % 16 | 80 | 16 | 150 | 8 |
| 29 1751 2000 45 | % 20 | 45 | 20 | 104 | 8 |
| 29 1751 2000 80 | % 20 | 80 | 20 | 150 | 8 |




MICRO GRAIN | KARNASCH NORM | DIN 6535 Form HA | 0° | HPC | NHC 7000 | Air

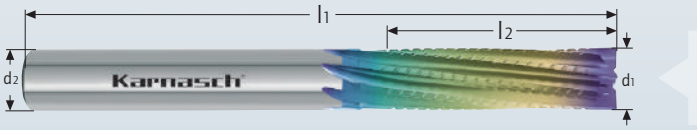
Schnittdaten Cutting data | Zeichnungen Drawings
1414-1415 | DXF/STEP

% Sonderpreis / Sale Artikel. Lieferbar solange Vorrat.
Special price / sale article. While stocks last.

## 29 1752

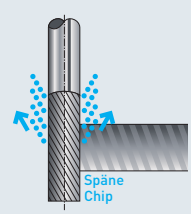
Vollhartmetall-Schrupp- und Schlichtfräser, 8 Frässchneiden / ziehender Schnitt
Solid carbide roughing and finishing cutter for CFRP/GFRP, 8 milling blades / drawing cut

COMPO-SITES | PA PE PI | PTFE FEP PVDF | ALUMINIUM non-ferrous | PA | Kupfer copper | PA-66 | PE PP | PMMA GS | PMMA XT | SAN | Honey comb




| | |
|---|---|
| d1* = Ø 4,0 - Ø 6,0 | tol -0,000 / -0,048 |
| d1* = Ø 8,0 - Ø 10,0 | tol -0,000 / -0,058 |
| d1* = Ø 12,0 - Ø 16,0 | tol -0,000 / -0,070 |
| d1* = Ø 20,0 | tol -0,000 / -0,084 |

| Art. | d1* | l2 | d2 h6 | l1 | Z |
|---|---|---|---|---|---|
| 29 1752 0400 16 | • 4 | 16 | 6 | 60 | 8 |
| 29 1752 0500 18 | • 5 | 18 | 6 | 60 | 8 |
| 29 1752 0600 20 | • 6 | 20 | 6 | 60 | 8 |
| 29 1752 0600 25 | • 6 | 25 | 6 | 65 | 8 |
| 29 1752 0600 30 | • 6 | 30 | 6 | 75 | 8 |
| 29 1752 0600 50 | • 6 | 50 | 6 | 100 | 8 |
| 29 1752 0800 22 | • 8 | 22 | 8 | 63 | 8 |
| 29 1752 0800 32 | • 8 | 32 | 8 | 75 | 8 |
| 29 1752 0800 50 | • 8 | 50 | 8 | 100 | 8 |
| 29 1752 1000 32 | • 10 | 32 | 10 | 72 | 8 |
| 29 1752 1000 60 | • 10 | 60 | 10 | 120 | 8 |
| 29 1752 1200 32 | • 12 | 32 | 12 | 82 | 8 |
| 29 1752 1200 70 | • 12 | 70 | 12 | 120 | 8 |
| 29 1752 1600 36 | % 16 | 36 | 16 | 92 | 8 |
| 29 1752 1600 80 | % 16 | 80 | 16 | 150 | 8 |
| 29 1752 2000 45 | % 20 | 45 | 20 | 104 | 8 |
| 29 1752 2000 80 | % 20 | 80 | 20 | 150 | 8 |




MICRO GRAIN | KARNASCH NORM | DIN 6535 Form HA | 8° R | HPC | NHC 7000 | Air

Schnittdaten Cutting data | Zeichnungen Drawings
1414-1415 | DXF/STEP

% Sonderpreis / Sale Artikel. Lieferbar solange Vorrat.
Special price / sale article. While stocks last.

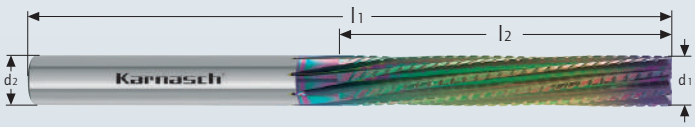


Grampelhuber GmbH | A-4810 Gmunden/Österreich | T: +43 (0)7612-64902-0 | F: +43 (0)7612-64902-8 | mail: office@grampelhuber.at | www.grampelhuber.at

Vollhartmetall-Schrupp- und Schlichtfräser, 8 Frässchneiden / schiebender Schnitt
Solid carbide roughing and finishing cutter for CFRP/GFRP, 8 milling blades / pushing cut

29 1753

COMPO-SITES | PA PE PI | PTFE FEP PVDF | ALUMINIUM non-ferrous | PA | Kupfer copper | PA-66 | PE PP | PMMA GS | PMMA XT | SAN | Honey comb



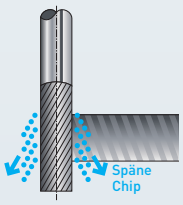

Z 8

MICRO GRAIN | KARNASCH NORM | DIN 6535 Form HA | 8° | HPC | NHC 7000 | Air

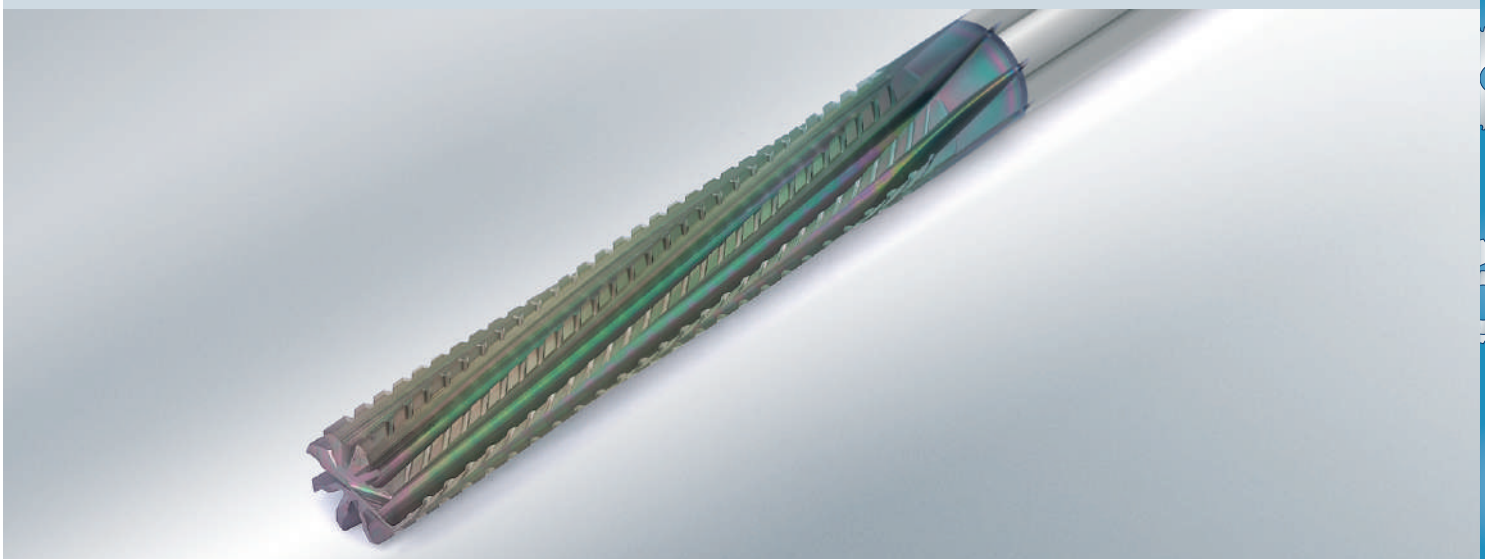
| | |
|---|---|
| d1* = Ø 4,0 - Ø 6,0 | tol -0,000 / -0,048 |
| d1* = Ø 8,0 - Ø 10,0 | tol -0,000 / -0,058 |
| d1* = Ø 12,0 - Ø 16,0 | tol -0,000 / -0,070 |
| d1* = Ø 20,0 | tol -0,000 / -0,084 |

| Art. | d1* | l2 | d2 h6 | l1 | Z |
|---|---|---|---|---|---|
| 29 1753 0400 16 | • 4 | 16 | 6 | 60 | 8 |
| 29 1753 0500 18 | • 5 | 18 | 6 | 60 | 8 |
| 29 1753 0600 20 | • 6 | 20 | 6 | 60 | 8 |
| 29 1753 0600 25 | • 6 | 25 | 6 | 65 | 8 |
| 29 1753 0600 30 | • 6 | 30 | 6 | 75 | 8 |
| 29 1753 0600 50 | • 6 | 50 | 6 | 100 | 8 |
| 29 1753 0800 22 | • 8 | 22 | 8 | 63 | 8 |
| 29 1753 0800 32 | • 8 | 32 | 8 | 75 | 8 |
| 29 1753 0800 50 | • 8 | 50 | 8 | 100 | 8 |
| 29 1753 1000 32 | • 10 | 32 | 10 | 72 | 8 |
| 29 1753 1000 60 | • 10 | 60 | 10 | 120 | 8 |
| 29 1753 1200 32 | • 12 | 32 | 12 | 82 | 8 |
| 29 1753 1200 70 | • 12 | 70 | 12 | 120 | 8 |
| 29 1753 2000 45 | % 20 | 45 | 20 | 104 | 8 |
| 29 1753 2000 80 | % 20 | 80 | 20 | 150 | 8 |

% Sonderpreis / Sale Artikel. Lieferbar solange Vorrat.
Special price / sale article. While stocks last.




Schnittdaten Cutting data: 1414-1415
Zeichnungen Drawings: DXF/STEP





29 1751
Gerade genutet
Straight flute



29 1752
Rechtsspirale, rechtsschneidend
Rightspiral, rightcutting

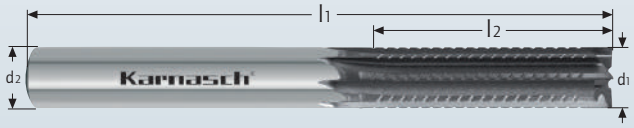


29 1753
Linksspirale, rechtsschneidend
Leftspiral, rightcutting

## 29 1761

Vollhartmetall-Schrupp- und Schlichtfräser für CFK-GFK, 8 Frässchneiden, 4 Stirnschneiden / gerade Verzahnung
Solid carbide roughing and finishing cutter for CFRP-GFRP, 8 milling blades 4 cutting edges / straight teeth

COMPO-SITES | GRAPHIT graphite
CFK CFRP | FR 4
PVDF GF25
GF GF25
PEEK GF30
PA66 GF30
POM GF25
PVDF GF30
Honey comb

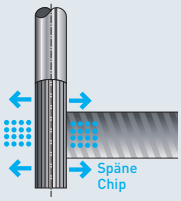






| | |
|---|---|
| d1* = Ø 4,0 - Ø 6,0 | tol -0,000 / -0,048 |
| d1* = Ø 8,0 - Ø 10,0 | tol -0,000 / -0,058 |
| d1* = Ø 12,0 - Ø 16,0 | tol -0,000 / -0,070 |
| d1* = Ø 20,0 | tol -0,000 / -0,084 |

| Art. | d1* | l2 | d2 h6 | l1 | Z |
|---|---|---|---|---|---|
| 29 1761 0400 16 | • 4 | 16 | 6 | 60 | 8 |
| 29 1761 0500 18 | • 5 | 18 | 6 | 60 | 8 |
| 29 1761 0600 20 | • 6 | 20 | 6 | 60 | 8 |
| 29 1761 0600 25 | • 6 | 25 | 6 | 65 | 8 |
| 29 1761 0600 30 | • 6 | 30 | 6 | 75 | 8 |
| 29 1761 0600 50 | • 6 | 50 | 6 | 100 | 8 |
| 29 1761 0800 22 | • 8 | 22 | 8 | 63 | 8 |
| 29 1761 0800 32 | • 8 | 32 | 8 | 75 | 8 |
| 29 1761 0800 50 | • 8 | 50 | 8 | 100 | 8 |
| 29 1761 1000 32 | • 10 | 32 | 10 | 72 | 8 |
| 29 1761 1000 60 | • 10 | 60 | 10 | 120 | 8 |
| 29 1761 1200 32 | • 12 | 32 | 12 | 82 | 8 |
| 29 1761 1200 70 | • 12 | 70 | 12 | 120 | 8 |
| 29 1761 1600 36 | % 16 | 36 | 16 | 92 | 8 |
| 29 1761 1600 80 | % 16 | 80 | 16 | 150 | 8 |
| 29 1761 2000 45 | % 20 | 45 | 20 | 104 | 8 |




% Sonderpreis / Sale Artikel. Lieferbar solange Vorrat.
Special price / sale article. While stocks last.

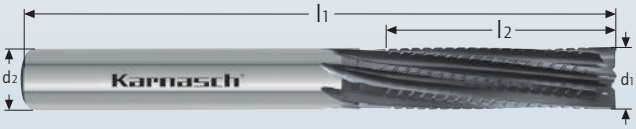
MICRO GRAIN | KARNASCH NORM
DIN 6535 Form HA
0°
HPC
DCC031 impuls
Air

Schnittdaten Cutting data 1416-1417
Zeichnungen Drawings DXF/STEP

## 29 1762

Vollhartmetall-Schrupp- und Schlichtfräser für CFK-GFK, 8 Frässchneiden, 4 Stirnschneiden / ziehender Schnitt
Solid carbide roughing and finishing cutter for CFRP/GFRP, 8 milling blades 4 cutting edges / drawing cut

COMPO-SITES | GRAPHIT graphite
CFK CFRP | FR 4
PVDF GF25
GF GF25
PEEK GF30
PA66 GF30
POM GF25
PVDF GF30
Honey comb

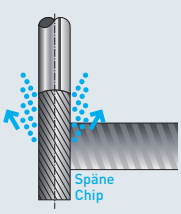






| | |
|---|---|
| d1* = Ø 4,0 - Ø 6,0 | tol -0,000 / -0,048 |
| d1* = Ø 8,0 - Ø 10,0 | tol -0,000 / -0,058 |
| d1* = Ø 12,0 - Ø 16,0 | tol -0,000 / -0,070 |
| d1* = Ø 20,0 | tol -0,000 / -0,084 |

| Art. | d1* | l2 | d2 h6 | l1 | Z |
|---|---|---|---|---|---|
| 29 1762 0400 16 | • 4 | 16 | 6 | 60 | 8 |
| 29 1762 0500 18 | • 5 | 18 | 6 | 60 | 8 |
| 29 1762 0600 20 | • 6 | 20 | 6 | 60 | 8 |
| 29 1762 0600 25 | • 6 | 25 | 6 | 65 | 8 |
| 29 1762 0600 30 | • 6 | 30 | 6 | 75 | 8 |
| 29 1762 0600 50 | • 6 | 50 | 6 | 100 | 8 |
| 29 1762 0800 22 | • 8 | 22 | 8 | 63 | 8 |
| 29 1762 0800 32 | • 8 | 32 | 8 | 75 | 8 |
| 29 1762 0800 50 | • 8 | 50 | 8 | 100 | 8 |
| 29 1762 1000 32 | • 10 | 32 | 10 | 72 | 8 |
| 29 1762 1000 60 | • 10 | 60 | 10 | 120 | 8 |
| 29 1762 1200 32 | • 12 | 32 | 12 | 82 | 8 |
| 29 1762 1200 70 | • 12 | 70 | 12 | 120 | 8 |
| 29 1762 1600 36 | % 16 | 36 | 16 | 92 | 8 |
| 29 1762 1600 80 | % 16 | 80 | 16 | 150 | 8 |
| 29 1762 2000 45 | % 20 | 45 | 20 | 104 | 8 |
| 29 1762 2000 80 | % 20 | 80 | 20 | 150 | 8 |




% Sonderpreis / Sale Artikel. Lieferbar solange Vorrat.
Special price / sale article. While stocks last.

MICRO GRAIN | KARNASCH NORM
DIN 6535 Form HA
8° R
HPC
DCC031 impuls
Air

Schnittdaten Cutting data 1416-1417
Zeichnungen Drawings DXF/STEP

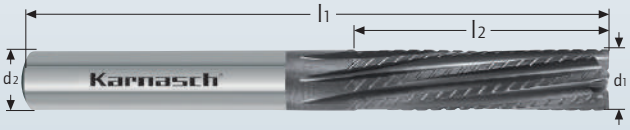


Grampelhuber GmbH | A-4810 Gmunden/Österreich | T: +43 (0)7612-64902-0 | F: +43 (0)7612-64902-8 | mail: office@grampelhuber.at | www.grampelhuber.at

## Vollhartmetall-Schrupp- und Schlichtfräser für CFK-GFK, 8 Frässchneiden, 4 Stirnschneiden / schiebender Schnitt
## Solid carbide roughing and finishing cutter for CFRP-GFRP, 8 milling blades 4 cutting edges / pushing cut

**29 1763**

COMPO-SITES | GRAPHIT *graphite*
CFK *CFRP* | **FR 4**
PVDF GF25
GF GF25
PEEK GF30
PA66 GF30
POM GF25
PVDF GF30
Honey comb

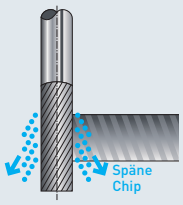



Z 4/8

MICRO GRAIN | KARNASCH NORM
DIN 6535 Form HA
8°
HPC
DCC031 impuls
Air

| | |
|---|---|
| d1* = Ø 4,0 - Ø 6,0 | tol -0,000 / -0,048 |
| d1* = Ø 8,0 - Ø 10,0 | tol -0,000 / -0,058 |
| d1* = Ø 12,0 - Ø 16,0 | tol -0,000 / -0,070 |
| d1* = Ø 20,0 | tol -0,000 / -0,084 |

| Art. | d1* | l2 | d2 h6 | l1 | Z |
|---|---|---|---|---|---|
| 29 1763 0400 16 | • 4 | 16 | 6 | 60 | 8 |
| 29 1763 0500 18 | • 5 | 18 | 6 | 60 | 8 |
| 29 1763 0600 20 | • 6 | 20 | 6 | 60 | 8 |
| 29 1763 0600 25 | • 6 | 25 | 6 | 65 | 8 |
| 29 1763 0600 30 | • 6 | 30 | 6 | 75 | 8 |
| 29 1763 0600 50 | • 6 | 50 | 6 | 100 | 8 |
| 29 1763 0800 22 | • 8 | 22 | 8 | 63 | 8 |
| 29 1763 0800 32 | • 8 | 32 | 8 | 75 | 8 |
| 29 1763 0800 50 | • 8 | 50 | 8 | 100 | 8 |
| 29 1763 1000 32 | • 10 | 32 | 10 | 72 | 8 |
| 29 1763 1000 60 | • 10 | 60 | 10 | 120 | 8 |
| 29 1763 1200 32 | • 12 | 32 | 12 | 82 | 8 |
| 29 1763 1200 70 | • 12 | 70 | 12 | 120 | 8 |
| 29 1763 1600 80 | % 16 | 80 | 16 | 150 | 8 |
| 29 1763 2000 45 | % 20 | 45 | 20 | 104 | 8 |
| 29 1763 2000 80 | % 20 | 80 | 20 | 150 | 8 |



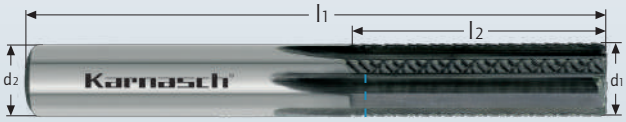

% Sonderpreis / Sale Artikel. Lieferbar solange Vorrat.
Special price / sale article. While stocks last.

Schnittdaten Cutting data: 1416-1417
Zeichnungen Drawings: DXF/STEP

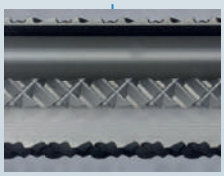
## Diamantbeschichteter Composites Cross Finish Router
## Diamond coated Composites Cross Finish Router

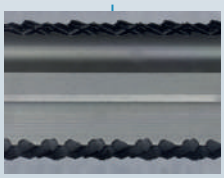
**29 1771**

COMPO-SITES | GRAPHIT *graphite*
CFK *CFRP* | **FR 4**
PVDF GF25
GF GF25
PEEK GF30
PA66 GF30
POM GF25
PVDF GF30




Z 4 Ø 4 | Z 6 Ø 6 - Ø 10

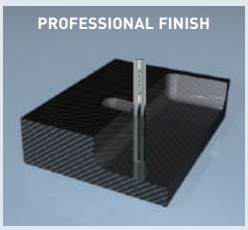

Crossverzahnung ziehend
Cross toothing, upcut

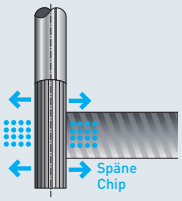

Schlichtschneide
Finishing cut


Crossverzahnung schiebend
Cross toothing, downcut

MICRO GRAIN | KARNASCH NORM
DIN 6535 Form HA
0°
f 45°
HPC
DCA-06 PLUS
Air

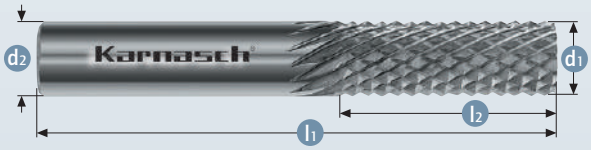
| Art. | d1 | f | l2 | d2 h5 | l1 | Z |
|---|---|---|---|---|---|---|
| 29 1771 0400 16 | • 4 | 0,1 | 16 | 6 | 57 | 4 |
| 29 1771 0600 22 | • 6 | 0,1 | 22 | 6 | 57 | 6 |
| 29 1771 0800 27 | • 8 | 0,2 | 27 | 8 | 63 | 6 |
| 29 1771 1000 30 | • 10 | 0,2 | 30 | 10 | 72 | 6 |




Schnittdaten Cutting data: 1413
Zeichnungen Drawings: DXF/STEP

COMPO-SITES | Schicht-stoffe Laminates
GFK GFRP | Kevlar
CFK CFRP | AL/TI
Aramid fiber AFK-SFK | TI-CFK TI-CFRP
Hybrid-stoffe hybrid materials | GMT
CFK-ALU Composite CFRP-ALU Composites | SMC




Toleranzen
Tolerances

d1

Ø 1.6 mm, 2.4 mm
= +0,00/–0,10

Ø 3–12 mm
= +0,00/–0,13

## GFK, CFK

Für Kunststoffe, GFK, CFK, MMC

Routers for fiberglass, GFK, CFK

Schnittdaten Cutting data 1406 | Film Movie

Diese Frässtifte sind geeignet zum Umrissfräsen, Besäumen, Nuten und Bohren der großen Bandbreite von Faserverstärkten Kunststoffen (Fiberglas, GFK, CFK). Weiterhin für MMC (Metal Matrix Composites = schwer zerspanbare abrasive Verbundstoffe wie z.B. Leiterplatten, Verbindungen wie Keramik mit Glasfaser, Graphit, Carbon.
**Für CFK/GFK empfehlen wir unsere DCA-06 Diamantbeschichtung.**

These routers are for contouring, grooving, drilling of a wide range of GFK, CFK, fiberglass reinforced plastics, as well as MMC (Metal Matrix Composites). MMC material such as printed circuit boards, composites such as ceramic with glass fiber, graphite, carbon etc.
**We recommend for CFRP/GFRP our DCA-06 diamond coating.**



| | | | | | 11 6001 | 11 6002 | 11 6003 | 11 6004 |
|---|---|---|---|---|---|---|---|---|
| | | | | | Ohne Stirnverzahnung / No end cut | Mehrschneiden Stirnverzahnung / Bur end cut | Zweischneiden Stirnverzahnung / 2-flute end mill cut | Bohrspitze 135° / Drill point 135° |
| d1 | l2 | d2 | l1 | VHM solid | Art. | Art. | Art. | Art. |
| ● 1,6 | 5 | 3 | 38 | ✔ | - | 11 6002 001 | 11 6003 001 | 11 6004 001 |
| ● 2,4 | 9,5 | 3 | 38 | ✔ | - | 11 6002 003 | 11 6003 003 | - |
| ● 3 | 12 | 3 | 38 | ✔ | 11 6001 005 | 11 6002 005 | 11 6003 005 | 11 6004 005 |
| ● 4 | 16 | 4 | 50 | ✔ | - | 11 6002 010 | 11 6003 010 | 11 6004 010 |
| ● 4 | 16 | 6 | 50 | ✔ | - | 11 6002 012 | 11 6003 012 | 11 6004 012 |
| ● 6 | 19 | 6 | 50 | ✔ | 11 6001 013 | 11 6002 013 | 11 6003 013 | 11 6004 013 |
| ● 6 | 19 | 6 | 63 | ✔ | 11 6001 015 | 11 6002 015 | 11 6003 015 | 11 6004 015 |
| ● 6 | 25 | 6 | 75 | ✔ | 11 6001 017 | 11 6002 017 | 11 6003 017 | 11 6004 017 |
| ● 8 | 25 | 8 | 63 | ✔ | 11 6001 020 | 11 6002 020 | 11 6003 020 | 11 6004 020 |
| ○ 10 | 25 | 10 | 63 | ✔ | % 11 6001 025 | - | - | - |
| ● 10 | 25 | 10 | 75 | ✔ | 11 6001 027 | 11 6002 027 | 11 6003 027 | 11 6004 027 |
| ● 12 | 25 | 12 | 75 | ✔ | 11 6001 029 | 11 6002 029 | 11 6003 029 | 11 6004 029 |
| ○ 12 | 30 | 12 | 75 | ✔ | % 11 6001 030 | - | - | - |

% Sonderpreis / Sale Artikel. Lieferbar solange Vorrat.
Special price / sale article. While stocks last.



Grampelhuber GmbH | A-4810 Gmunden/Österreich | T: +43 (0)7612-64902-0 | F: +43 (0)7612-64902-8 | mail: office@grampelhuber.at | www.grampelhuber.at

Die Schneide macht den Unterschied zwischen CVD, PKD Extreme und Diamantbeschichtung

**29 6522** Ø 8,0 CVD-Schneide

## CVD

Mit sehr scharfer Schneide, 99,9 % Diamant.
With a very sharp blade, 99.9 % Diamond.



Ø 8,0 CVD-Schneidkante
CVD-cutting edge

Objektiv Z 250 : 500×

**30 6522** Ø 8,0 PKD-Schneide

## PCD EXTREME

Poröse Struktur / scharfe Schneide.
Porous structure / sharp edge.



Ø 8,0 PKD Extreme-Schneidkante
PCD Extreme-cutting edge

Objektiv Z 250 : 500×

**30 6551** Ø 8,0 Diamantbeschichtung

## DIAMOND COATED

Schneide ist verrundet.
Cutting edge is rounded.



Ø 8,0
Diamantbeschichtete Schneidkante
Diamond coated cutting edge

Objektiv Z 250 : 500×



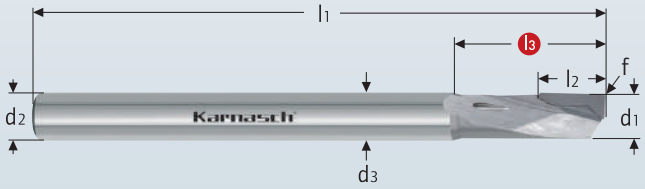


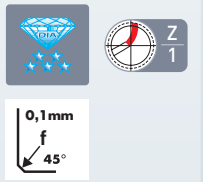
Grampelhuber GmbH | A-4810 Gmunden/Österreich | T: +43 (0)7612-64902-0 | F: +43 (0)7612-64902-8 | mail: office@grampelhuber.at | www.grampelhuber.at

## 29 6510

CVD-Einzahnfräser, rechtsspirale – rechtsschneidend mit Innenkühlung
CVD one-tooth end mill, right spiral – right cutting with interior cooling

COMPO-SITES | PE PP | Acryl Acrylic
GFK-CFK *GFRP-CFRP* | ZIRKONIUM ZIRCONIUM
Aramid fiber AFK-SFK | GF GF25
Hybrid-stoffe hybrid materials | PVDF GF25
CFK-ALU Composite CFRP-ALU Composites | TITAN titanium
Schicht-stoffe Laminates | TITAN *titanium < 1200 N/mm²*
PA66 GF30 | Aluminium > 6% Si
PVDF GF30 | MESSING brass
PA | Kupfer copper




CVD | KARNASCH NORM
SPEZIAL SPECIAL | DIN 6535 Form HA
8° R | f 45°
HSC High-Speed-Cutting
99,9% Diamant Diamond
Air

QUALITY CONTROL 100 % ONLY THE BEST

| Art. | d1 h7 | f | l3 | l2 | d2 h6 | d3 | l1 |
|---|---|---|---|---|---|---|---|
| 29 6510 0800 12 | % 8,0 | 0,1 | 25 | 12 | 8 | 7,5 | 80 |
| 29 6510 1000 16 | % 10,0 | 0,1 | 30 | 16 | 10 | 9,5 | 80 |
| 29 6510 1200 20 | % 12,0 | 0,1 | 33 | 20 | 12 | 11,5 | 80 |

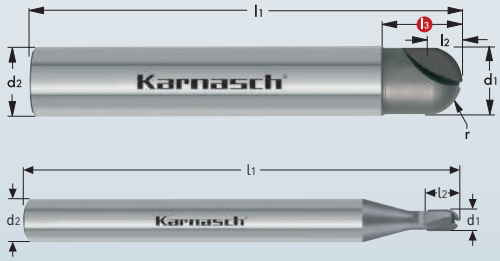
% Sonderpreis / Sale Artikel. Lieferbar solange Vorrat.
Special price / sale article. While stocks last.

Schnittdaten Cutting data 1372-1373 | Zeichnungen Drawings DXF/STEP

## 29 6521

CVD-3D-Radiusfräser mit Kugelstirn, extra kurz
CVD-3D-ball milling cutter, extra short high-speed-cutting

COMPO-SITES | E.MAX FOR CAD/CAM TECHNOLOGY | KUNSTSTOFF-GRAPHIT plastic-graphite
GFK-CFK *GFRP-CFRP* | GF GF25 | Ampco
Aramid fiber AFK-SFK | PVDF GF25
Hybrid-stoffe hybrid materials | TITAN titanium
CFK-ALU Composite CFRP-ALU Composites | TITAN *titanium < 1200 N/mm²*
Schicht-stoffe Laminates | Aluminium > 6% Si
PA66 GF30 | MESSING brass
PVDF GF30 | Kupfer copper
ZIRKONIUM ZIRCONIUM | STAHL-GRAPHIT steel-graphite










CVD | KARNASCH NORM
SPEZIAL SPECIAL | DIN 6535 Form HA
0°
HSC High-Speed-Cutting
99,9% Diamant Diamond
Oil | Emul | MMKS | Air

QUALITY CONTROL 100 % ONLY THE BEST

| Art. | d1 h7 | r ± 0,005 | l3 | d2 h6 | l1 | l2 | Z |
|---|---|---|---|---|---|---|---|
| 29 6521 0200 04 | % 2 | 1,0 | - | 4 | 50 | 2,5 | 2 |
| 29 6521 0200 06 | % 2 | 1,0 | - | 6 | 50 | 2,5 | 2 |
| 29 6521 0300 04 | % 3 | 1,5 | - | 4 | 50 | 2,5 | 2 |
| 29 6521 0300 06 | % 3 | 1,5 | - | 6 | 50 | 2,5 | 2 |
| 29 6521 0300 10 | % 3 | 1,5 | 10 | 6 | 50 | 2,5 | 2 |
| 29 6521 0400 06 | % 4 | 2,0 | - | 6 | 50 | 2,5 | 2 |
| 29 6521 0500 06 | % 5 | 2,5 | - | 6 | 50 | 3,0 | 2 |
| 29 6521 0600 06 | % 6 | 3,0 | - | 6 | 50 | 6,0 | 2 |
| 29 6521 0800 08 | % 8 | 4,0 | - | 8 | 60 | 7,0 | 2 |
| 29 6521 1000 10 | % 10 | 5,0 | - | 10 | 60 | 8,0 | 2 |
| 29 6521 1200 12 | % 12 | 6,0 | - | 12 | 65 | 9,0 | 2 |

% Sonderpreis / Sale Artikel. Lieferbar solange Vorrat.
Special price / sale article. While stocks last.

Schnittdaten Cutting data 1374-1377 | Zeichnungen Drawings DXF/STEP

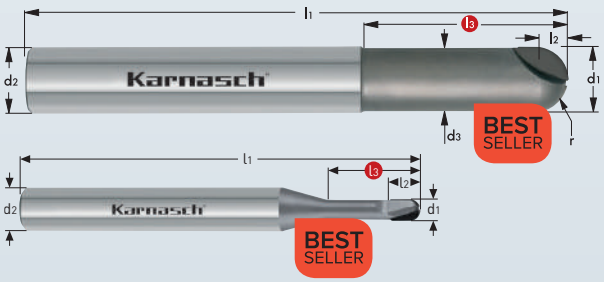


Grampelhuber GmbH | A-4810 Gmunden/Österreich | T: +43 (0)7612-64902-0 | F: +43 (0)7612-64902-8 | mail: office@grampelhuber.at | www.grampelhuber.at

# CVD-3D-Radiusfräser mit Kugelstirn
# CVD-3D-ball milling cutter

29 6522

COMPO-SITES | GF GF25
GFK-CFK GFRP-CFRP | PVDF GF25
Aramid fiber AFK-SFK | TITAN titanium
Hybrid-stoffe hybrid materials | TITAN titanium < 1200 N/mm²
CFK-ALU Composite CFRP-ALU Composites | Aluminium > 6% Si
Schicht-stoffe Laminates | MESSING brass
PA66 GF30 | Kupfer copper
PVDF GF30 | STAHL-GRAPHIT steel-graphite
ZIRKONIUM ZIRCONIUM | KUNSTSTOFF-GRAPHIT plastic-graphite
E.MAX FOR CAD/CAM TECHNOLOGY | Ampco
FR 4







> Ø 2,0

Ø 2,0

| | |
|---|---|
| d1* = Ø ≤ 3,0 | tol -0,000 / -0,010 |
| d1* = Ø 4,0 - Ø 6,0 | tol -0,000 / -0,012 |
| d1* = Ø 8,0 - Ø 10,0 | tol -0,000 / -0,015 |
| d1* = Ø 12,0 | tol -0,000 / -0,018 |

QUALITY CONTROL 100 % ONLY THE BEST

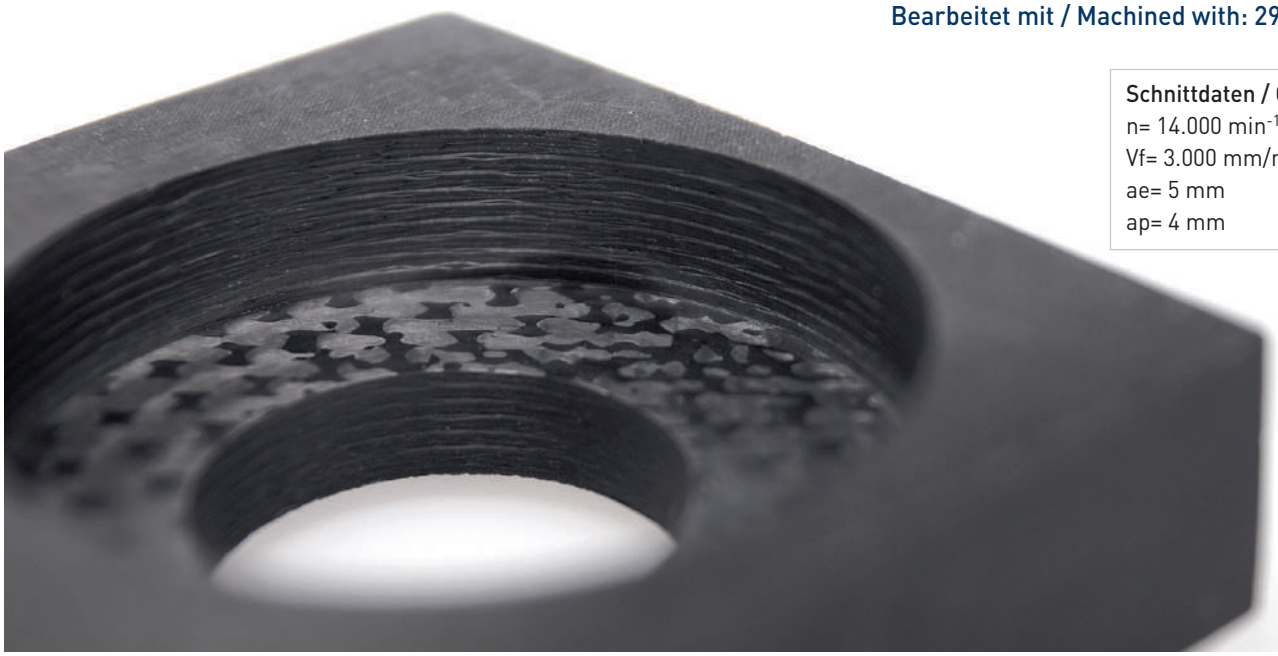
CVD | KARNASCH NORM
SPEZIAL SPECIAL | DIN 6535 Form HA
0°
HSC High-Speed-Cutting
99,9% Diamant Diamond
Öl Emul MMKS Air

Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1* | r ± 0,005 | l3 | d2 h6 | d3 | l1 | l2 | Z |
|---|---|---|---|---|---|---|---|---|
| 29 6522 0200 06 04 | • 2 | 1,0 | 6 | 4 | 1,92 | 50 | 2,5 | 2 |
| 29 6522 0200 08 04 | • 2 | 1,0 | 8 | 4 | 1,92 | 50 | 2,5 | 2 |
| 29 6522 0200 10 04 | • 2 | 1,0 | 10 | 4 | 1,92 | 50 | 2,5 | 2 |
| 29 6522 0200 06 06 | • 2 | 1,0 | 6 | 6 | 1,92 | 50 | 2,5 | 2 |
| 29 6522 0200 08 06 | • 2 | 1,0 | 8 | 6 | 1,92 | 50 | 2,5 | 2 |
| 29 6522 0200 10 06 | • 2 | 1,0 | 10 | 6 | 1,92 | 50 | 2,5 | 2 |
| 29 6522 0200 12 06 | • 2 | 1,0 | 12 | 6 | 1,92 | 50 | 2,5 | 2 |
| 29 6522 0300 06 04 | • 3 | 1,5 | 6 | 4 | 2,8 | 50 | 2,5 | 2 |
| 29 6522 0300 08 04 | • 3 | 1,5 | 8 | 4 | 2,8 | 50 | 2,5 | 2 |
| 29 6522 0300 10 04 | • 3 | 1,5 | 10 | 4 | 2,8 | 50 | 2,5 | 2 |
| 29 6522 0300 10 06 | • 3 | 1,5 | 10 | 6 | 2,8 | 75 | 2,5 | 2 |
| 29 6522 0300 15 06 | • 3 | 1,5 | 15 | 6 | 2,8 | 75 | 2,5 | 2 |
| 29 6522 0300 20 06 | • 3 | 1,5 | 20 | 6 | 2,8 | 75 | 2,5 | 2 |
| 29 6522 0400 10 06 | • 4 | 2,0 | 10 | 6 | 3,8 | 75 | 2,5 | 2 |
| 29 6522 0400 20 06 | • 4 | 2,0 | 20 | 6 | 3,8 | 75 | 2,5 | 2 |
| 29 6522 0400 30 06 | • 4 | 2,0 | 30 | 6 | 3,8 | 75 | 2,5 | 2 |
| 29 6522 0500 15 06 | • 5 | 2,5 | 15 | 6 | 4,6 | 75 | 3,0 | 2 |
| 29 6522 0500 25 06 | • 5 | 2,5 | 25 | 6 | 4,6 | 75 | 3,0 | 2 |
| 29 6522 0500 35 06 | • 5 | 2,5 | 35 | 6 | 4,6 | 75 | 3,0 | 2 |
| 29 6522 0600 20 06 | • 6 | 3,0 | 20 | 6 | 5,6 | 100 | 6,0 | 2 |
| 29 6522 0600 30 06 | • 6 | 3,0 | 30 | 6 | 5,6 | 100 | 6,0 | 2 |
| 29 6522 0600 40 06 | • 6 | 3,0 | 40 | 6 | 5,6 | 100 | 6,0 | 2 |
| 29 6522 0800 25 08 | • 8 | 4,0 | 25 | 8 | 7,4 | 100 | 7,0 | 2 |
| 29 6522 0800 40 08 | • 8 | 4,0 | 40 | 8 | 7,4 | 100 | 7,0 | 2 |
| 29 6522 1000 30 10 | • 10 | 5,0 | 30 | 10 | 9,6 | 100 | 8,0 | 2 |
| 29 6522 1000 50 10 | • 10 | 5,0 | 50 | 10 | 9,6 | 100 | 8,0 | 2 |
| 29 6522 1200 35 12 | • 12 | 6,0 | 35 | 12 | 11,6 | 105 | 9,0 | 2 |
| 29 6522 1200 60 12 | • 12 | 6,0 | 60 | 12 | 11,6 | 105 | 9,0 | 2 |

Schnittdaten Cutting data | Zeichnungen Drawings
1374-1377 | DXF/STEP

## Material: CFK / CFRP
## Bearbeitet mit / Machined with: 29 0526 Ø8,0×20



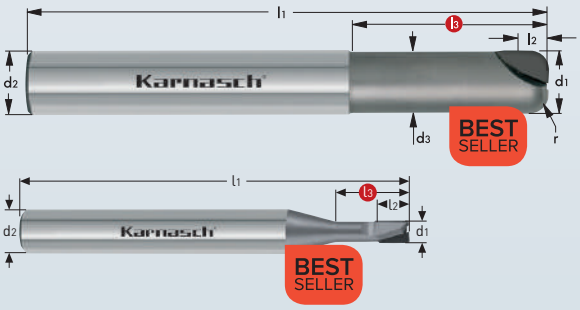
**Schnittdaten / Cutting data:**
n= 14.000 min$^{-1}$
Vf= 3.000 mm/min
ae= 5 mm
ap= 4 mm

Film Movie

# 29 6523

CVD-Schaftfräser mit Eckenradius
CVD-end mill with corner radius

COMPO-SITES | GF GF25
GFK-CFK GFRP-CFRP | PVDF GF25
Aramid fiber AFK-SFK | TITAN titanium
Hybrid-stoffe hybrid materials | TITAN titanium < 1200 N/mm²
CFK-ALU Composite CFRP-ALU Composites | Aluminium > 6% Si
Schicht-stoffe Laminates | MESSING brass
PA66 GF30 | Kupfer copper
PVDF GF30 | STAHL-GRAPHIT steel-graphite
ZIRKONIUM ZIRCONIUM | KUNSTSTOFF-GRAPHIT plastic-graphite
E.MAX FOR CAD/CAM TECHNOLOGY | Ampco
FR 4







Z 2 > Ø 2,0

Z 2 Ø 2,0

| | | |
|---|---|---|
| d1* | = Ø ≤ 3,0 | tol -0,000 / -0,010 |
| d1* | = Ø 4,0 - Ø 6,0 | tol -0,000 / -0,012 |
| d1* | = Ø 8,0 - Ø 10,0 | tol -0,000 / -0,015 |
| d1* | = Ø 12,0 | tol -0,000 / -0,018 |

QUALITY CONTROL 100 % ONLY THE BEST

CVD | KARNASCH NORM
SPEZIAL SPECIAL | DIN 6535 Form HA
0° | r
HSC High-Speed-Cutting
99,9% Diamant Diamond
Oil | Emul | MMKS | Air

Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1* | r ± 0,005 | l3 | d2 h6 | d3 | l1 | l2 | Z |
|---|---|---|---|---|---|---|---|---|
| 29 6523 0200 020 04 | • 2 | 0,2 | 4 | 4 | 1,92 | 50 | 2,5 | 2 |
| 29 6523 0200 020 06 | • 2 | 0,2 | 6 | 4 | 1,92 | 50 | 2,5 | 2 |
| 29 6523 0200 020 08 | • 2 | 0,2 | 8 | 4 | 1,92 | 50 | 2,5 | 2 |
| 29 6523 0200 020 10 | • 2 | 0,2 | 10 | 4 | 1,92 | 50 | 2,5 | 2 |
| 29 6523 0300 030 10 | • 3 | 0,3 | 10 | 6 | 2,8 | 75 | 2,5 | 2 |
| 29 6523 0300 030 15 | • 3 | 0,3 | 15 | 6 | 2,8 | 75 | 2,5 | 2 |
| 29 6523 0300 030 20 | • 3 | 0,3 | 20 | 6 | 2,8 | 75 | 2,5 | 2 |
| 29 6523 0300 050 10 | • 3 | 0,5 | 10 | 6 | 2,8 | 75 | 2,5 | 2 |
| 29 6523 0300 050 15 | • 3 | 0,5 | 15 | 6 | 2,8 | 75 | 2,5 | 2 |
| 29 6523 0300 050 20 | • 3 | 0,5 | 20 | 6 | 2,8 | 75 | 2,5 | 2 |
| 29 6523 0400 030 10 | • 4 | 0,3 | 10 | 6 | 3,8 | 75 | 2,5 | 2 |
| 29 6523 0400 030 20 | • 4 | 0,3 | 20 | 6 | 3,8 | 75 | 2,5 | 2 |
| 29 6523 0400 030 30 | • 4 | 0,3 | 30 | 6 | 3,8 | 75 | 2,5 | 2 |
| 29 6523 0400 050 10 | • 4 | 0,5 | 10 | 6 | 3,8 | 75 | 2,5 | 2 |
| 29 6523 0400 050 20 | • 4 | 0,5 | 20 | 6 | 3,8 | 75 | 2,5 | 2 |
| 29 6523 0400 050 30 | • 4 | 0,5 | 30 | 6 | 3,8 | 75 | 2,5 | 2 |
| 29 6523 0500 030 15 | • 5 | 0,3 | 15 | 6 | 4,6 | 75 | 3,0 | 2 |
| 29 6523 0500 030 25 | • 5 | 0,3 | 25 | 6 | 4,6 | 75 | 3,0 | 2 |
| 29 6523 0500 030 35 | • 5 | 0,3 | 35 | 6 | 4,6 | 75 | 3,0 | 2 |
| 29 6523 0500 050 15 | • 5 | 0,5 | 15 | 6 | 4,6 | 75 | 3,0 | 2 |
| 29 6523 0500 050 25 | • 5 | 0,5 | 25 | 6 | 4,6 | 75 | 3,0 | 2 |
| 29 6523 0500 050 35 | • 5 | 0,5 | 35 | 6 | 4,6 | 75 | 3,0 | 2 |
| 29 6523 0600 030 20 | • 6 | 0,3 | 20 | 6 | 5,6 | 100 | 6,0 | 2 |
| 29 6523 0600 030 30 | • 6 | 0,3 | 30 | 6 | 5,6 | 100 | 6,0 | 2 |
| 29 6523 0600 030 40 | • 6 | 0,3 | 40 | 6 | 5,6 | 100 | 6,0 | 2 |
| 29 6523 0600 050 20 | • 6 | 0,5 | 20 | 6 | 5,6 | 100 | 6,0 | 2 |
| 29 6523 0600 050 30 | • 6 | 0,5 | 30 | 6 | 5,6 | 100 | 6,0 | 2 |
| 29 6523 0600 050 40 | • 6 | 0,5 | 40 | 6 | 5,6 | 100 | 6,0 | 2 |
| 29 6523 0600 100 20 | • 6 | 1,0 | 20 | 6 | 5,6 | 100 | 6,0 | 2 |
| 29 6523 0600 100 30 | • 6 | 1,0 | 30 | 6 | 5,6 | 100 | 6,0 | 2 |
| 29 6523 0600 100 40 | • 6 | 1,0 | 40 | 6 | 5,6 | 100 | 6,0 | 2 |
| 29 6523 0800 030 25 | • 8 | 0,3 | 25 | 8 | 7,6 | 100 | 7,0 | 2 |
| 29 6523 0800 030 40 | • 8 | 0,3 | 40 | 8 | 7,6 | 100 | 7,0 | 2 |
| 29 6523 0800 050 25 | • 8 | 0,5 | 25 | 8 | 7,6 | 100 | 7,0 | 2 |
| 29 6523 0800 050 40 | • 8 | 0,5 | 40 | 8 | 7,6 | 100 | 7,0 | 2 |
| 29 6523 0800 100 25 | • 8 | 1,0 | 25 | 8 | 7,6 | 100 | 7,0 | 2 |
| 29 6523 0800 100 40 | • 8 | 1,0 | 40 | 8 | 7,6 | 100 | 7,0 | 2 |
| 29 6523 1000 050 30 | • 10 | 0,5 | 30 | 10 | 9,6 | 100 | 8,0 | 2 |
| 29 6523 1000 050 50 | • 10 | 0,5 | 50 | 10 | 9,6 | 100 | 8,0 | 2 |
| 29 6523 1000 100 30 | • 10 | 1,0 | 30 | 10 | 9,6 | 100 | 8,0 | 2 |
| 29 6523 1000 100 50 | • 10 | 1,0 | 50 | 10 | 9,6 | 100 | 8,0 | 2 |
| 29 6523 1200 050 35 | • 12 | 0,5 | 35 | 12 | 11,6 | 105 | 9,0 | 2 |
| 29 6523 1200 050 60 | • 12 | 0,5 | 60 | 12 | 11,6 | 105 | 9,0 | 2 |
| 29 6523 1200 100 35 | • 12 | 1,0 | 35 | 12 | 11,6 | 105 | 9,0 | 2 |
| 29 6523 1200 100 60 | • 12 | 1,0 | 60 | 12 | 11,6 | 105 | 9,0 | 2 |

Schnittdaten Cutting data 1372-1377
Zeichnungen Drawings DXF/STEP

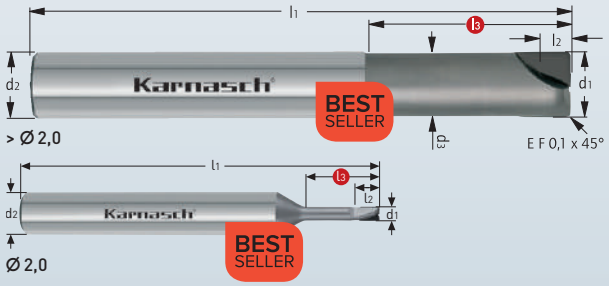


Grampelhuber GmbH | A-4810 Gmunden/Österreich | T: +43 (0)7612-64902-0 | F: +43 (0)7612-64902-8 | mail: office@grampelhuber.at | www.grampelhuber.at

## CVD-Schaftfräser, zylindrisch
## CVD-end mills

**29 6524**

COMPO-SITES | E.MAX FOR CAD/CAM TECHNOLOGY | KUNSTSTOFF-GRAPHIT plastic-graphite
GFK-CFK GFRP-CFRP | GF GF25 | Ampco
Aramid fiber AFK-SFK | PVDF GF25 | FR 4
Hybrid-stoffe hybrid materials | TITAN titanium
CFK-ALU Composite CFRP-ALU Composites | TITAN titanium < 1200 N/mm²
Schicht-stoffe Laminates | Aluminium > 6% Si
PA66 GF30 | MESSING brass
PVDF GF30 | Kupfer copper
ZIRKONIUM ZIRCONIUM | STAHL-GRAPHIT steel-graphite




CVD | KARNASCH NORM
SPEZIAL SPECIAL | DIN 6535 Form HA
0° | 45° x 0,1
HSC High-Speed-Cutting
99,9% Diamant Diamond
Oil | Emul | MMKS | Air

| | | | |
|---|---|---|---|
| d1* = Ø ≤ 3,0 | tol -0,000 / -0,010 | d1* = Ø 8,0 - Ø 10,0 | tol -0,000 / -0,015 |
| d1* = Ø 4,0 - Ø 6,0 | tol -0,000 / -0,012 | d1* = Ø 12,0 - Ø 16,0 | tol -0,000 / -0,018 |

Zeichnungen Drawings
DXF/STEP

Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1* | f ±0,02 | l3 | d2 h6 | d3 | l1 | l2 | Z |
|---|---|---|---|---|---|---|---|---|
| 29 6524 0200 04 | 2 | 0,1 | 4 | 4 | 1,92 | 50 | 2,5 | 2 |
| 29 6524 0200 06 | 2 | 0,1 | 6 | 4 | 1,92 | 50 | 2,5 | 2 |
| 29 6524 0200 08 | 2 | 0,1 | 8 | 4 | 1,92 | 50 | 2,5 | 2 |
| 29 6524 0200 10 | 2 | 0,1 | 10 | 4 | 1,92 | 50 | 2,5 | 2 |
| 29 6524 0300 10 | 3 | 0,1 | 10 | 6 | 2,8 | 75 | 2,5 | 2 |
| 29 6524 0300 15 | 3 | 0,1 | 15 | 6 | 2,8 | 75 | 2,5 | 2 |
| 29 6524 0300 20 | 3 | 0,1 | 20 | 6 | 2,8 | 75 | 2,5 | 2 |
| 29 6524 0400 10 | 4 | 0,1 | 10 | 6 | 3,8 | 75 | 2,5 | 2 |
| 29 6524 0400 20 | 4 | 0,1 | 20 | 6 | 3,8 | 75 | 2,5 | 2 |
| 29 6524 0400 30 | 4 | 0,1 | 30 | 6 | 3,8 | 75 | 2,5 | 2 |
| 29 6524 0500 15 | 5 | 0,1 | 15 | 6 | 4,6 | 75 | 3,0 | 2 |
| 29 6524 0500 25 | 5 | 0,1 | 25 | 6 | 4,6 | 75 | 3,0 | 2 |
| 29 6524 0500 35 | 5 | 0,1 | 35 | 6 | 4,6 | 75 | 3,0 | 2 |
| 29 6524 0600 20 | 6 | 0,1 | 20 | 6 | 5,6 | 100 | 6,0 | 2 |
| 29 6524 0600 30 | 6 | 0,1 | 30 | 6 | 5,6 | 100 | 6,0 | 2 |
| 29 6524 0600 40 | 6 | 0,1 | 40 | 6 | 5,6 | 100 | 6,0 | 2 |
| 29 6524 0800 25 | 8 | 0,1 | 25 | 8 | 7,4 | 100 | 7,0 | 2 |
| 29 6524 0800 40 | 8 | 0,1 | 40 | 8 | 7,4 | 100 | 7,0 | 2 |
| 29 6524 1000 30 | 10 | 0,1 | 30 | 10 | 9,6 | 100 | 8,0 | 2 |
| 29 6524 1000 50 | 10 | 0,1 | 50 | 10 | 9,6 | 100 | 8,0 | 2 |
| 29 6524 1200 35 | 12 | 0,1 | 35 | 12 | 11,6 | 105 | 9,0 | 2 |
| 29 6524 1200 60 | 12 | 0,1 | 60 | 12 | 11,6 | 105 | 9,0 | 2 |

QUALITY CONTROL 100 % ONLY THE BEST

Schnittdaten Cutting data
1372-1377

| Test | Reale Schnittdaten Real cutting data 29 6524 Ø2,0×4 |
|---|---|
| Werkstoff / Material | VHM-G55 / Solid carbide G55 |
| | Finishen / Finishing |
| | n = 5.000 min$^{-1}$ |
| | fz = 0,04 mm |
| | ae = 2 mm |
| | ap = 0,01 mm |

## CVD-Schaftfräser, extra kurz
## CVD-end mills

**29 6525**

COMPO-SITES | E.MAX FOR CAD/CAM TECHNOLOGY | KUNSTSTOFF-GRAPHIT plastic-graphite
GFK-CFK GFRP-CFRP | GF GF25 | Ampco
Aramid fiber AFK-SFK | PVDF GF25 | FR 4
Hybrid-stoffe hybrid materials | TITAN titanium
CFK-ALU Composite CFRP-ALU Composites | TITAN titanium < 1200 N/mm²
Schicht-stoffe Laminates | Aluminium > 6% Si
PA66 GF30 | MESSING brass
PVDF GF30 | Kupfer copper
ZIRKONIUM ZIRCONIUM | STAHL-GRAPHIT steel-graphite




CVD | KARNASCH NORM
SPEZIAL SPECIAL | DIN 6535 Form HA
0° | 45° x 0,1
HSC High-Speed-Cutting
99,9% Diamant Diamond
Oil | Emul | MMKS | Air

| | | | |
|---|---|---|---|
| d1* = Ø ≤ 3,0 | tol -0,000 / -0,010 | d1* = Ø 8,0 - Ø 10,0 | tol -0,000 / -0,015 |
| d1* = Ø 4,0 - Ø 6,0 | tol -0,000 / -0,012 | d1* = Ø 12,0 - Ø 16,0 | tol -0,000 / -0,018 |

QUALITY CONTROL 100 % ONLY THE BEST

Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1* | f ±0,02 | l2 | d2 h6 | l1 | Z |
|---|---|---|---|---|---|---|
| 29 6525 0300 05 | 3 | 0,1 | 5 | 6 | 50 | 2 |
| 29 6525 0400 10 | 4 | 0,1 | 10 | 6 | 50 | 2 |
| 29 6525 0500 10 | 5 | 0,1 | 10 | 6 | 50 | 2 |
| 29 6525 0500 20 | 5 | 0,1 | 20 | 6 | 60 | 2 |
| 29 6525 0600 10 | 6 | 0,1 | 10 | 6 | 50 | 2 |
| 29 6525 0600 20 | 6 | 0,1 | 20 | 6 | 60 | 2 |
| 29 6525 0800 10 | 8 | 0,1 | 10 | 8 | 50 | 2 |
| 29 6525 0800 20 | 8 | 0,1 | 20 | 8 | 60 | 2 |
| 29 6525 1000 10 | 10 | 0,1 | 10 | 10 | 55 | 2 |
| 29 6525 1000 20 | 10 | 0,1 | 20 | 10 | 65 | 2 |
| 29 6525 1200 10 | 12 | 0,1 | 10 | 12 | 60 | 2 |
| 29 6525 1200 20 | 12 | 0,1 | 20 | 12 | 70 | 2 |
| 29 6525 1600 10 | 16 | 0,1 | 10 | 16 | 65 | 2 |
| 29 6525 1600 20 | 16 | 0,1 | 20 | 16 | 75 | 2 |

Schnittdaten Cutting data
1372-1377
Zeichnungen Drawings
DXF/STEP

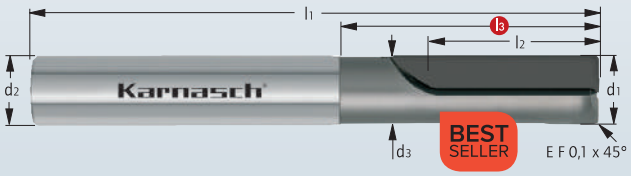




Grampelhuber GmbH | A-4810 Gmunden/Österreich | T: +43 (0)7612-64902-0 | F: +43 (0)7612-64902-8 | mail: office@grampelhuber.at | www.grampelhuber.at

# 29 6526 CVD-Schaftfräser / CVD-end mills

COMPO-SITES | E.MAX FOR CAD/CAM TECHNOLOGY | KUNSTSTOFF-GRAPHIT plastic-graphite
GFK-CFK GFRP-CFRP | GF GF25 | Ampco
Aramid fiber AFK-SFK | PVDF GF25 | FR 4
Hybrid-stoffe hybrid materials | TITAN titanium
CFK-ALU Composite CFRP-ALU Composites | TITAN titanium < 1200 N/mm²
Schicht-stoffe Laminates | Aluminium > 6% Si
PA66 GF30 | MESSING brass
PVDF GF30 | Kupfer copper
ZIRKONIUM ZIRCONIUM | STAHL-GRAPHIT steel-graphite




Z 2

CVD | KARNASCH NORM
SPEZIAL SPECIAL | DIN 6535 Form HA
0° | 45° x 0,1
HSC High-Speed-Cutting
99,9% Diamant Diamond

| | |
|---|---|
| d1* | = Ø 4,0 - Ø 6,0 tol -0,000 / -0,012 |
| d1* | = Ø 8,0 - Ø 10,0 tol -0,000 / -0,015 |
| d1* | = Ø 12,0 - Ø 16,0 tol -0,000 / -0,018 |

QUALITY CONTROL 100 % ONLY THE BEST

Zeichnungen Drawings
DXF/STEP

Schnittdaten Cutting data
Film Movie
1372-1377

Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1* | f ±0,02 | l2 | l3 | d2 h6 | d3 | l1 | Z |
|---|---|---|---|---|---|---|---|---|
| 29 6526 0400 08 | • 4 | 0,1 | 8 | 10 | 6 | 3,9 | 50 | 2 |
| 29 6526 0400 15 | • 4 | 0,1 | 15 | 20 | 6 | 3,9 | 50 | 2 |
| 29 6526 0600 10 | • 6 | 0,1 | 10 | 15 | 6 | 5,8 | 65 | 2 |
| 29 6526 0600 15 | • 6 | 0,1 | 15 | 20 | 6 | 5,8 | 65 | 2 |
| 29 6526 0600 20 | • 6 | 0,1 | 20 | 25 | 6 | 5,8 | 65 | 2 |
| 29 6526 0800 10 | • 8 | 0,1 | 10 | 15 | 8 | 7,6 | 70 | 2 |
| 29 6526 0800 15 | • 8 | 0,1 | 15 | 20 | 8 | 7,6 | 70 | 2 |
| 29 6526 0800 20 | • 8 | 0,1 | 20 | 30 | 8 | 7,6 | 70 | 2 |
| 29 6526 1000 10 | • 10 | 0,1 | 10 | 15 | 10 | 9,6 | 85 | 2 |
| 29 6526 1000 15 | • 10 | 0,1 | 15 | 20 | 10 | 9,6 | 85 | 2 |
| 29 6526 1000 20 | • 10 | 0,1 | 20 | 30 | 10 | 9,6 | 85 | 2 |
| 29 6526 1200 10 | • 12 | 0,1 | 10 | 15 | 12 | 11,8 | 92 | 2 |
| 29 6526 1200 15 | • 12 | 0,1 | 15 | 20 | 12 | 11,8 | 92 | 2 |
| 29 6526 1200 20 | • 12 | 0,1 | 20 | 30 | 12 | 11,8 | 92 | 2 |
| 29 6526 1600 10 | • 16 | 0,1 | 10 | 30 | 16 | 15,8 | 92 | 2 |
| 29 6526 1600 15 | • 16 | 0,1 | 15 | 35 | 16 | 15,8 | 92 | 2 |
| 29 6526 1600 20 | • 16 | 0,1 | 20 | 40 | 16 | 15,8 | 102 | 2 |

Qualitätsprodukte für die Composites Bearbeitung.
Quality products for machining composites.

Karnasch® PROFESSIONAL TOOLS




- BIS 1,0 MM DIAMANTSTÄRKE
- EXTREM SCHARFE SCHNEIDEN DURCH LASERVERFAHREN
- HOCHGENAUE SCHNEIDKANTENTOLERANZ VON MAX. 1µ
- STANDZEITENERHÖHUNG BIS ZU 300%

- UP TO 1,0 MM DIAMOND THICKNESS
- EXTREME SHARP CUTTING EDGE BY THE USE OF LASER PROCESS
- HIGH-PRECISION CUTTING EDGE TOLERANCE OF MAX. 1µ
- INCREASE OF TOOL LIFE UP TO 300%

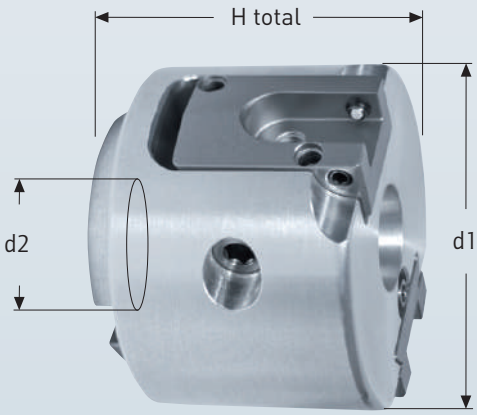


Grampelhuber GmbH | A-4810 Gmunden/Österreich | T: +43 (0)7612-64902-0 | F: +43 (0)7612-64902-8 | mail: office@grampelhuber.at | www.grampelhuber.at

# MKD-Diamant/PKD Hochglanz-Finish-Messerkopf
Knife edge for mirror finish

29 6620

Plexiglas acrylic glass | SAN
Acryl Acrylic | CORIAN
PMMA GS | Alu-minium
PE PP | Bronze bronze
PC PET PPE | MESSING brass
PMMA XT | Kupfer copper
SAN | Gold gold
PETG | TITAN titanium





Vorschneider
Read cutter
A


Fertigschneider
Finishing
B

Alu-minium | KARNASCH NORM
SPEZIAL SPECIAL | 
SPEZIAL SPECIAL | GRATFREI BURRFREE
 | ACRYLIC ALUMINIUM COPPER BRASS TITANIUM
 | PKD MKD
 | 


| Art. | Ø d1 | H total | d2 | Z |
|---|---|---|---|---|
| 29 6620 040 16 | • 40 | 45 | 16 | 2 |
| 29 6620 050 16 | • 50 | 45 | 16 | 2 |
| 29 6620 060 22 | • 60 | 45 | 22 | 2 |
| 29 6620 085 27 | • 85 | 55 | 27 | 2 |
| 29 6620 100 27 | • 100 | 48 | 27 | 2 |

Gerne erstellen wir Ihnen ein Fräsmuster mit Ihrem Material. Preis auf Anfrage (Erfolgt eine Bestellung über einen neuen komplett bestückten Messerkopf, entfallen die Fräskosten)

We can make a milling sample with your material. Price on request (We do not charge any costs, if you order a new complete equipped cutter head)

Schneideinsätze für Messerköpfe / hochglanz Spiegelschliff

Cutting insert for knife head/high gloss mirror finish

| | | | | | | |
|---|---|---|---|---|---|---|
| A |  | **PCD** Universal Read cutter | **PKD** Universal Vorschneidezahn | PMMA GS, PMMA XT, ALUMINIUM WEICH, KUPFER WEICH, MESSING WEICH, TITAN titanium | 29 6621 | |
| B |  | **ND** natural diamond Finishing Acrylic | **ND** Natur Diamant Fertigschneider Acryl | PMMA GS, PMMA XT, PE PP, SAN, PETG, CORIAN | 29 6622 | VIDEO |
| B |  | **ND** natural diamond Finishing Soft aluminum | **ND** Natur Diamant Fertigschneider Alu weich | ALUMINIUM WEICH, Gold gold | 29 6623 | VIDEO |
| B |  | **ND** natural diamond Finishing Soft copper | **ND** Natur Diamant Fertigschneider Kupfer weich | KUPFER WEICH, MESSING WEICH | 29 6624 | VIDEO |
| B |  | **ND** natural diamond Finishing TITANIUM | **ND** Natur Diamant Fertigschneider Titan | TITAN titanium | 29 6625 | |

Durch Diamantpreisschwankungen empfehlen wir vor Auftragserteilung die aktuellen Preise anzufragen. Diese finden Sie auch in unserem Onlineshop.

Because of diamond price fluctuation, we ask you, to request the current prices, before ordering. You will also find the prices in our online shop.

**Einstellen und Wuchten:** Wir empfehlen, uns mit Ihrer Bestellung Ihre Werkzeugaufnahme zur Verfügung zu stellen. Diese wird dann mit dem neu eingestellten Messerkopf gewuchtet. Nur so ist ein Spiegelfinish zu erreichen. Alle Diamant-Fertigschneider sind mehrfach nachschleifbar. Zum Nachschleifen mit Karnasch Originalgeometrie bitte um Angabe für welches Material: **Acryl Typ GS / Typ XT / Alu weich / Messing weich / Kupfer weich / Titan**

**Adjusting and balancing:** We recommend that you make the tool holder available to us when making your order. Your tool holder will be balanced with the newly adjusted cutter head. This is the only way to achieve a mirror finish. All natural diamond finishing cutters can be resharpened. We ask to specify which material should be machined: **Acrylic type GS / type XT / Aluminum soft /Brass / Copper / Titanium**

# 29 6811

MKD Monokristallin-Diamant, Radiusfräser für Hochglanz-Spiegelfinish
MKD/mono-crystal diamond radius milling cutter for high-gloss mirror finish

Plexiglas acrylic glass | MESSING WEICH BRASS SOFT
Acryl Acrylic | ACRYL ACRYLIC TYP GS
PMMA GS | ACRYL ACRYLIC TYP XT
ALUMINIUM WEICH ALUMINIUM SOFT | Gold gold
KUPFER WEICH COPPER SOFT



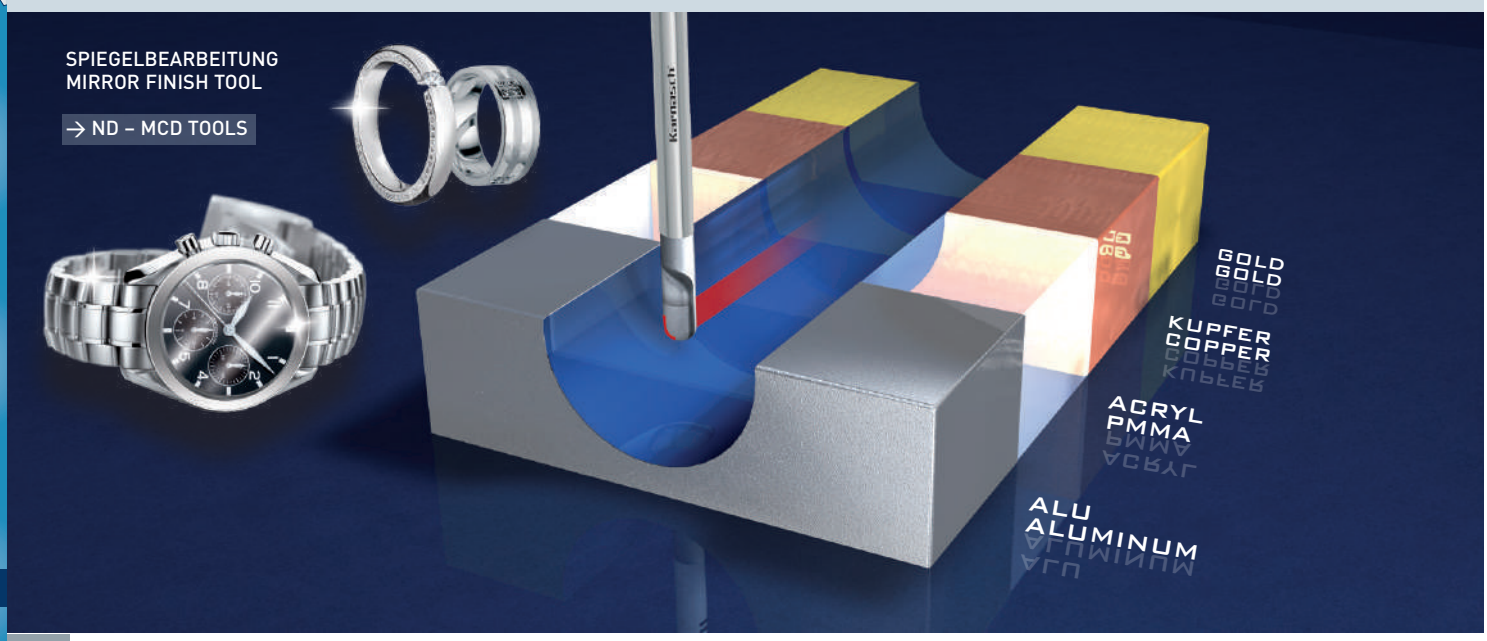

MKD Mono-kristallin MCD MONOCRYSTALLINE | KARNASCH NORM
SPEZIAL SPECIAL | DIN 6535 Form HA
SPEZIAL SPECIAL | Z=1 r
HSC HPC
GELÄPPT LAPPED

| Art. | d1 | r | l3 | d2 h5 | d3 | l1 | l2 | Z |
|---|---|---|---|---|---|---|---|---|
| 29 6811 0100 04 | • 1 | 0,5 | 4 | 4 | 0,9 | 50 | 3 | 1 |
| 29 6811 0150 04 | • 1,5 | 0,75 | 4 | 4 | 1,3 | 50 | 3 | 1 |
| 29 6811 0200 04 | • 2 | 1 | 4 | 4 | 1,7 | 50 | 3 | 1 |
| 29 6811 0300 04 | • 3 | 1,5 | 4 | 4 | 2,6 | 60 | 3 | 1 |
| 29 6811 0400 05 | • 4 | 2 | 5 | 6 | 3,5 | 65 | 3 | 1 |
| 29 6811 0600 05 | • 6 | 3 | 5 | 6 | 5,0 | 75 | 4 | 1 |

Durch Diamantpreisschwankungen empfehlen wir vor Auftragserteilung die aktuellen Preise anzufragen.
Die aktuellen Preise finden Sie in unserem Onlineshop.

Because of diamond price fluctuation, we ask you, to request the current prices, before ordering.
You will find the current prices in our online shop.

Schnittdaten Cutting data: 1413
Zeichnungen Drawings: DXF/STEP



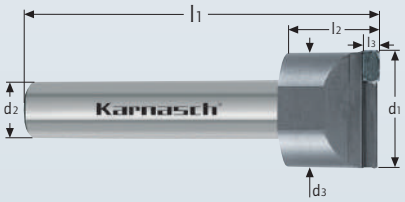



Grampelhuber GmbH | A-4810 Gmunden/Österreich | T: +43 (0)7612-64902-0 | F: +43 (0)7612-64902-8 | mail: office@grampelhuber.at | www.grampelhuber.at

# MKD/Monokristalliner Diamantfräser für Hochglanz Spiegelfinish, stirnschneidend
# MKD/mono-crystal diamond milling cutter for high-gloss mirror finish, end cutting

29 6837

Plexiglas acrylic glass | ALUMINIUM WEICH ALUMINIUM SOFT
Acryl Acrylic | ACRYL ACRYLIC TYP GS
PMMA GS | ACRYL ACRYLIC TYP XT
Gold gold | Kupfer copper




MKD Mono-kristallin MCD MONOCRYSTALLINE | KARNASCH NORM
SPEZIAL SPECIAL | DIN 6535 Form HA
SPEZIAL SPECIAL | r-spezial r-special
HSC HPC
GELÄPPT LAPPED

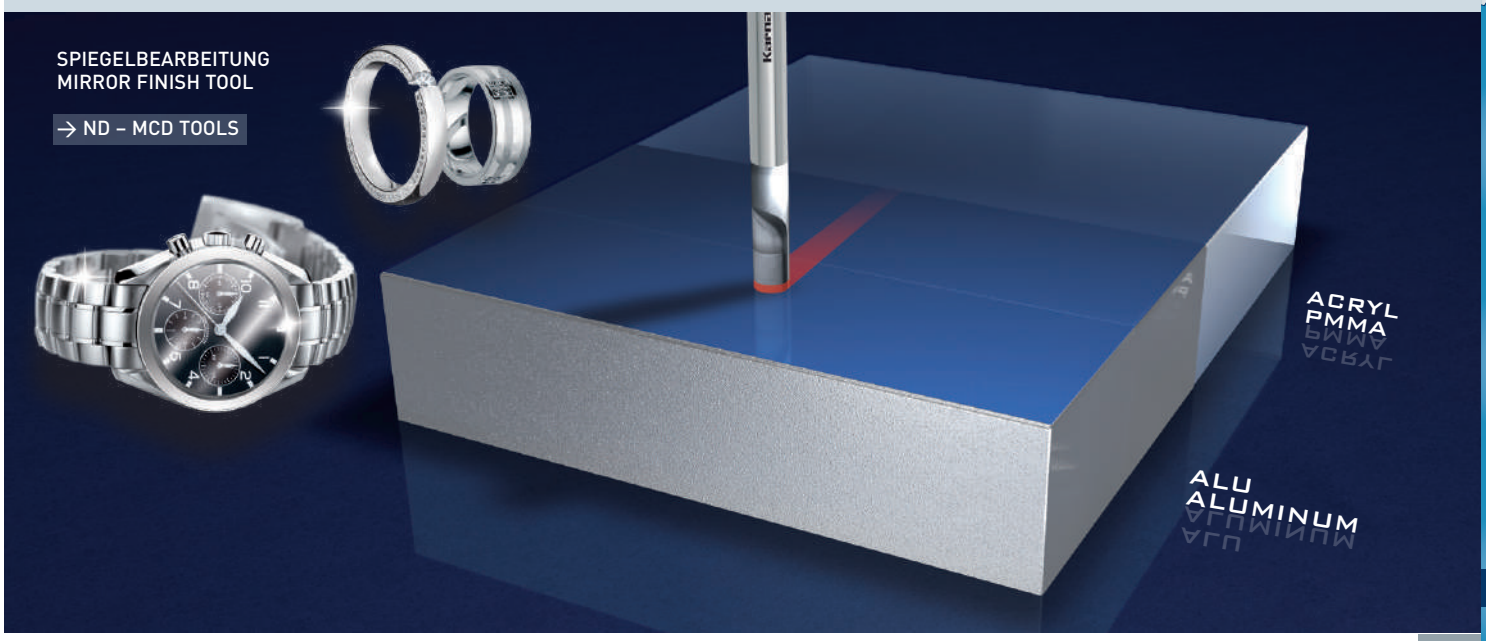
| Art. | d1 | d1 - 2 | d2 h5 | d3 | l1 | l2 | l3 |
|---|---|---|---|---|---|---|---|
| 29 6837 1200 | △ 12 | 5 | 8 | 11,4 | 60 | 15 | 3 |
| 29 6837 1600 | △ 16 | 5 | 10 | 15,4 | 60 | 15 | 3 |
| 29 6837 2000 | △ 20 | 5 | 10 | 19,4 | 60 | 15 | 3 |

Durch Diamantpreisschwankungen empfehlen wir vor Auftragserteilung die aktuellen Preise anzufragen.
Die aktuellen Preise finden Sie in unserem Onlineshop.

Because of diamond price fluctuation, we ask you, to request the current prices, before ordering.
You will find the current prices in our online shop.

△ Lieferbar solange Vorrat oder auf Anfrage.
Article be discontinued. Delivery possible until sold out. After sold out delivery possible on request.

Schnittdaten Cutting data: 1413
Zeichnungen Drawings: DXF/STEP



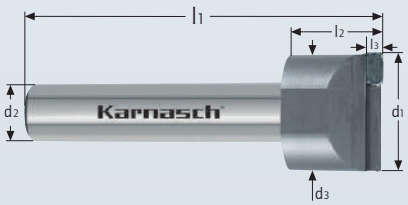



Grampelhuber GmbH | A-4810 Gmunden/Österreich | T: +43 (0)7612-64902-0 | F: +43 (0)7612-64902-8 | mail: office@grampelhuber.at | www.grampelhuber.at

# 29 6838

MKD/Monokristalliner Diamantfräser für Hochglanz Spiegelfinish, stirnschneidend
MKD/mono-crystal diamond milling cutter for high-gloss mirror finish, end cutting

KUPFER WEICH COPPER SOFT
MESSING WEICH BRASS SOFT
Gold gold
Silber silver




MKD Mono-kristallin MCD MONOCRYSTALLINE
KARNASCH NORM
SPEZIAL SPECIAL
DIN 6535 Form HA
SPEZIAL SPECIAL
r-spezial r-special
HSC HPC
GELÄPPT LAPPED

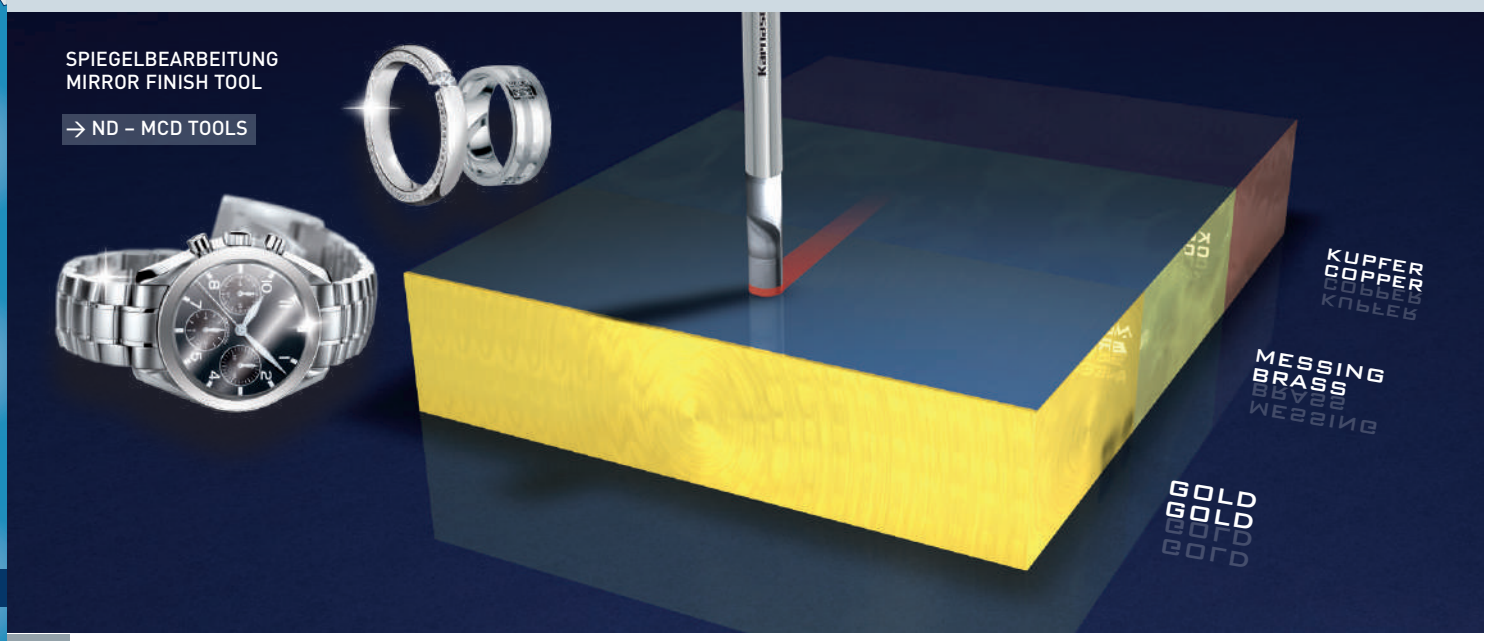
| Art. | d1 | d1 - 2 | d2 h5 | d3 | l1 | l2 | l3 |
|---|---|---|---|---|---|---|---|
| 29 6838 1200 | △ 12 | 5 | 8 | 11,4 | 60 | 15 | 3 |
| 29 6838 1600 | △ 16 | 5 | 10 | 15,4 | 60 | 15 | 3 |

Durch Diamantpreisschwankungen empfehlen wir vor Auftragserteilung die aktuellen Preise anzufragen.
Die aktuellen Preise finden Sie in unserem Onlineshop.

Because of diamond price fluctuation, we ask you, to request the current prices, before ordering.
You will find the current prices in our online shop.

△ Lieferbar solange Vorrat oder auf Anfrage.
Article be discontinued. Delivery possible until sold out. After sold out delivery possible on request.

Schnittdaten Cutting data
1413
Zeichnungen Drawings
DXF/STEP



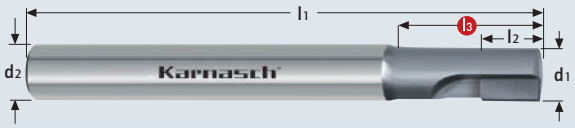



Grampelhuber GmbH | A-4810 Gmunden/Österreich | T: +43 (0)7612-64902-0 | F: +43 (0)7612-64902-8 | mail: office@grampelhuber.at | www.grampelhuber.at

# MKD/Monokristalliner Diamantfräser für Hochglanz Spiegelfinish, Umfangfräsen
# MKD/mono-crystal diamond milling cutter for high gloss mirror finish, profile-milling cutter

29 6839

**Acryl** Acrylic | MESSING WEICH BRASS SOFT
ACRYL ACRYLIC TYP GS | KUPFER WEICH COPPER SOFT
ACRYL ACRYLIC TYP XT | ALUMINIUM WEICH ALUMINIUM SOFT
**Plexiglas** acrylic glass | **Gold** gold
**PMMA GS** | **Silber** silver




Z 1
Ø 6,0-10,0

MKD Mono-kristallin MCD MONOCRYSTALLINE | KARNASCH NORM
SPEZIAL SPECIAL | DIN 6535 Form HA
0°
HSC High-Speed-Cutting
GELÄPPT LAPPED
Air

Gewuchtet / Balanced
< 40.000 U/min.

| Art. | Ø d1 ±0,03 | l2 | l3 | d2 h5 | d3 | l1 | Z |
|---|---|---|---|---|---|---|---|
| 29 6839 0600 03 | • 6,0 | 3 | 20 | 6 | 5,4 | 50 | 1 |
| 29 6839 0600 04 | • 6,0 | 4 | 20 | 6 | 5,4 | 50 | 1 |
| 29 6839 0600 05 | • 6,0 | 5 | 20 | 6 | 5,4 | 50 | 1 |
| 29 6839 0600 06 | • 6,0 | 6 | 20 | 6 | 5,4 | 50 | 1 |
| 29 6839 0800 04 | • 8,0 | 4 | 25 | 8 | 7,4 | 60 | 1 |
| 29 6839 0800 05 | • 8,0 | 5 | 25 | 8 | 7,4 | 60 | 1 |
| 29 6839 0800 06 | • 8,0 | 6 | 25 | 8 | 7,4 | 60 | 1 |
| 29 6839 0800 08 | • 8,0 | 8 | 25 | 8 | 7,4 | 60 | 1 |
| 29 6839 0800 10 | • 8,0 | 10 | 25 | 8 | 7,4 | 60 | 1 |
| 29 6839 0800 11 | • 8,0 | 11 | 25 | 8 | 7,4 | 60 | 1 |
| 29 6839 0800 12 | • 8,0 | 12 | 25 | 8 | 7,4 | 60 | 1 |
| 29 6839 1000 04 | • 10,0 | 4 | 25 | 10 | 9,4 | 60 | 1 |
| 29 6839 1000 05 | • 10,0 | 5 | 25 | 10 | 9,4 | 60 | 1 |
| 29 6839 1000 06 | • 10,0 | 6 | 25 | 10 | 9,4 | 60 | 1 |
| 29 6839 1000 08 | • 10,0 | 8 | 25 | 10 | 9,4 | 60 | 1 |
| 29 6839 1000 10 | • 10,0 | 10 | 25 | 10 | 9,4 | 60 | 1 |
| 29 6839 1000 11 | • 10,0 | 11 | 25 | 10 | 9,4 | 60 | 1 |
| 29 6839 1000 12 | • 10,0 | 12 | 25 | 10 | 9,4 | 60 | 1 |

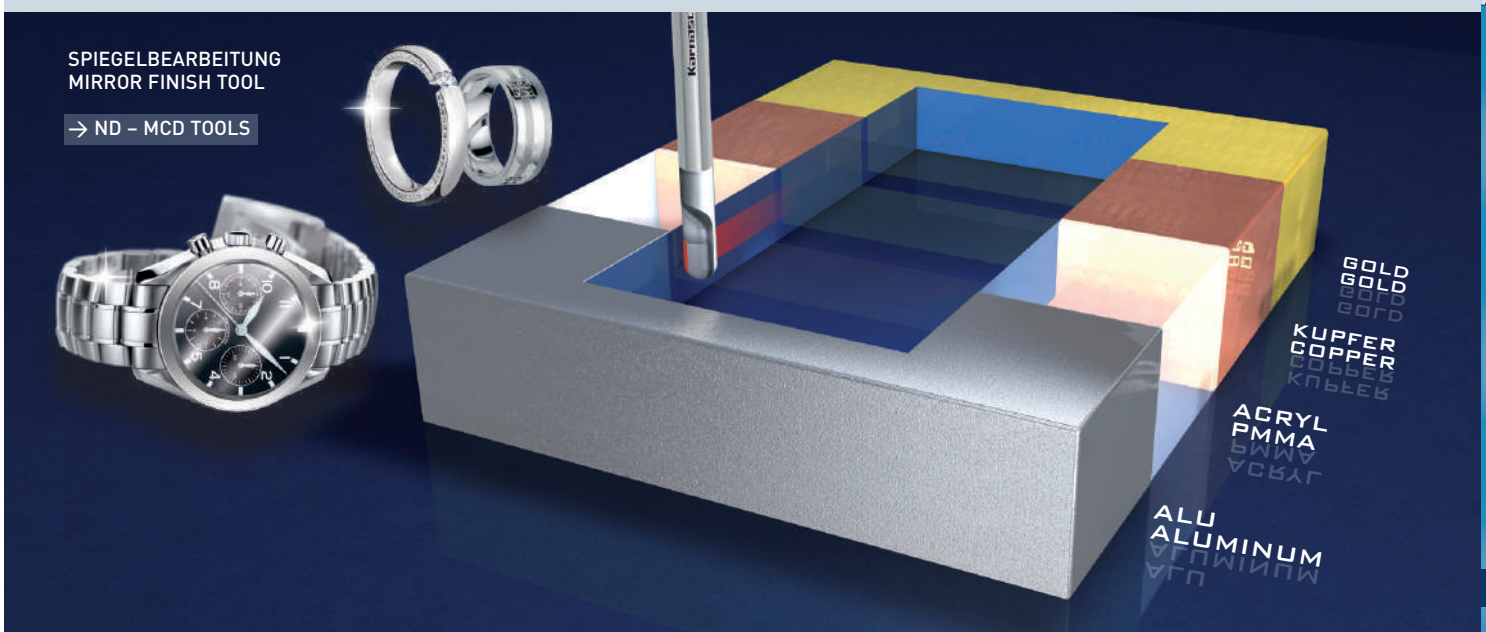
Schnittdaten Cutting data: 1413
Film Movie
Zeichnungen Drawings: DXF/STEP

Durch Diamantpreisschwankungen empfehlen wir vor Auftragserteilung die aktuellen Preise anzufragen. Die aktuellen Preise finden Sie in unserem Onlineshop.

Because of diamond price fluctuation, we ask you, to request the current prices, before ordering. You will find the current prices in our online shop.

Bei Ihrer Bestellung bitten wir um Information, welches Material Sie bearbeiten um die Schneidengeometrie anzupassen.

When ordering, please inform us which material you want to machine to adjust the cutting geometry.



# 29 6840

MKD/Monokristalliner Diamantfräser für Hochglanz Spiegelfinish, Umfangfräser und stirnschneidend
MKD/mono-crystal diamond milling cutter for high-gloss mirror finish, circumference-milling cutter and end cutting

**Acryl** Acrylic

**ALUMINIUM WEICH** ALUMINIUM SOFT

**Plexiglas** acrylic glass

**PMMA GS**




Z 1

Ø 1,0-6,0

**MKD** Mono-kristallin MCD MONOCRYSTALLINE

KARNASCH NORM

**SPEZIAL** SPECIAL

DIN 6535 Form HA

0°

**HSC** High-Speed-Cutting

**GELÄPPT** LAPPED

Air

Gewuchtet / Balanced < 60.000 U/min.

Ø 1,0-1,5 kein perfektes Spiegelfinish bei stirnseitigem Einsatz.
Ø 1,0-1,5 no perfect mirror finish by milling on the front cutting edge.

| Art. | Ø d1 ±0,03 | l2 | l3 | d2 h5 | d3 | l1 | Z |
|---|---|---|---|---|---|---|---|
| 29 6840 0100 02 | • 1,0 | 2 | – | 4 | – | 50 | 1 |
| 29 6840 0100 03 | • 1,0 | 3 | – | 4 | – | 50 | 1 |
| 29 6840 0100 04 | • 1,0 | 4 | – | 4 | – | 50 | 1 |
| 29 6840 0150 03 | • 1,5 | 3 | – | 4 | – | 50 | 1 |
| 29 6840 0150 04 | • 1,5 | 4 | – | 4 | – | 50 | 1 |
| 29 6840 0150 05 | • 1,5 | 5 | – | 4 | – | 50 | 1 |
| 29 6840 0200 03 | • 2,0 | 3 | – | 4 | – | 50 | 1 |
| 29 6840 0200 04 | • 2,0 | 4 | – | 4 | – | 50 | 1 |
| 29 6840 0200 05 | • 2,0 | 5 | – | 4 | – | 50 | 1 |
| 29 6840 0200 06 | • 2,0 | 6 | – | 4 | – | 50 | 1 |
| 29 6840 0300 03 | • 3,0 | 3 | – | 4 | – | 60 | 1 |
| 29 6840 0300 04 | • 3,0 | 4 | – | 4 | – | 60 | 1 |
| 29 6840 0300 05 | • 3,0 | 5 | – | 4 | – | 60 | 1 |
| 29 6840 0300 06 | • 3,0 | 6 | – | 4 | – | 60 | 1 |
| 29 6840 0400 03 | • 4,0 | 3 | 12 | 4 | 3,4 | 50 | 1 |
| 29 6840 0400 04 | • 4,0 | 4 | 12 | 4 | 3,4 | 50 | 1 |
| 29 6840 0400 05 | • 4,0 | 5 | 12 | 4 | 3,4 | 50 | 1 |
| 29 6840 0400 06 | • 4,0 | 6 | 12 | 4 | 3,4 | 50 | 1 |
| 29 6840 0600 03 | • 6,0 | 3 | 20 | 6 | 5,4 | 50 | 1 |
| 29 6840 0600 04 | • 6,0 | 4 | 20 | 6 | 5,4 | 50 | 1 |
| 29 6840 0600 05 | • 6,0 | 5 | 20 | 6 | 5,4 | 50 | 1 |
| 29 6840 0600 06 | • 6,0 | 6 | 20 | 6 | 5,4 | 50 | 1 |

Schnittdaten Cutting data

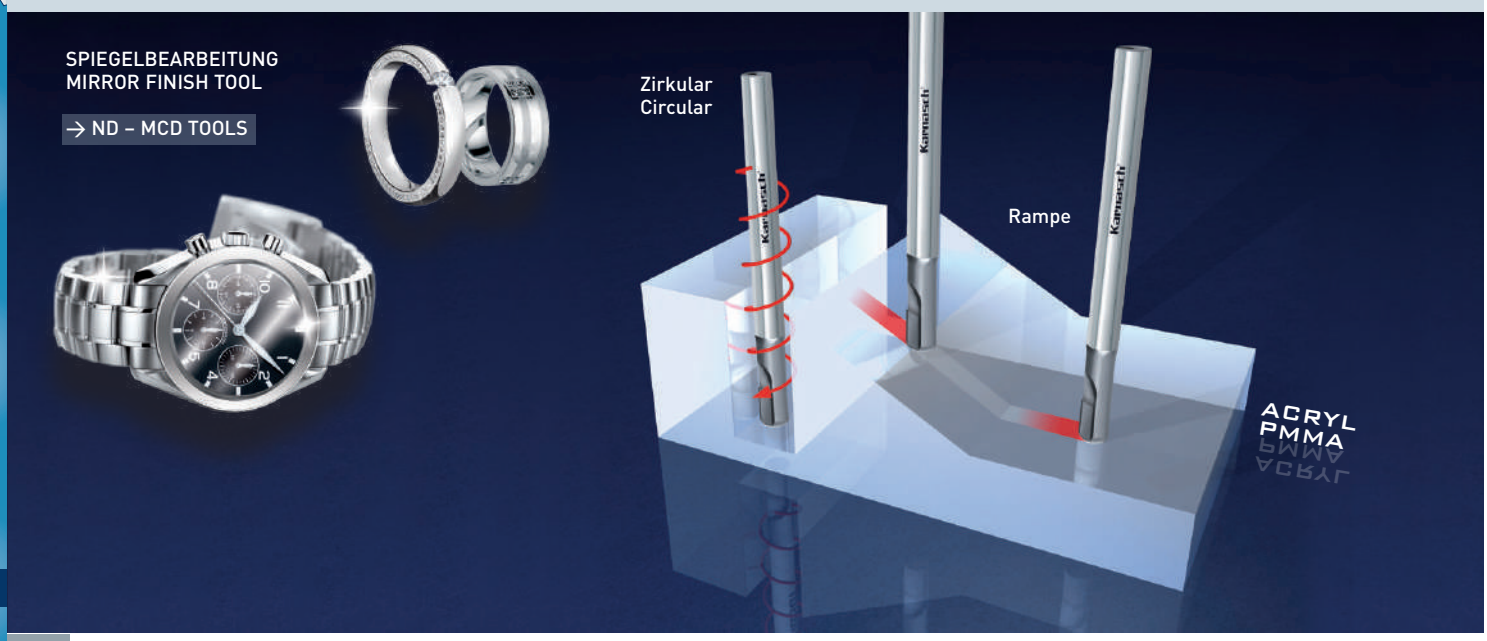
1413

Zeichnungen Drawings

DXF/STEP

Durch Diamantpreisschwankungen empfehlen wir vor Auftragserteilung die aktuellen Preise anzufragen.
Die aktuellen Preise finden Sie in unserem Onlineshop.

Because of diamond price fluctuation, we ask you, to request the current prices, before ordering.
You will find the current prices in our online shop.





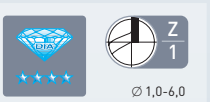

Grampelhuber GmbH | A-4810 Gmunden/Österreich | T: +43 (0)7612-64902-0 | F: +43 (0)7612-64902-8 | mail: office@grampelhuber.at | www.grampelhuber.at

# MKD/Monokristalliner Diamantfräser für Hochglanz Spiegelfinish, Umfangfräser und stirnschneidend
# MKD/mono-crystal diamond milling cutter for high-gloss mirror finish, circumference-milling cutter and end cutting

29 6841

MESSING brass
Kupfer copper
Gold gold
Silber silver




MKD Mono-kristallin MCD MONOCRYSTALLINE
KARNASCH NORM
SPEZIAL SPECIAL
DIN 6535 Form HA
0°
HSC High-Speed-Cutting
GELÄPPT LAPPED
Air

Gewuchtet / Balanced < 60.000 U/min.

Ø 1,0-1,5 kein perfektes Spiegelfinish bei stirnseitigem Einsatz.
Ø 1,0-1,5 no perfect mirror finish by milling on the front cutting edge.

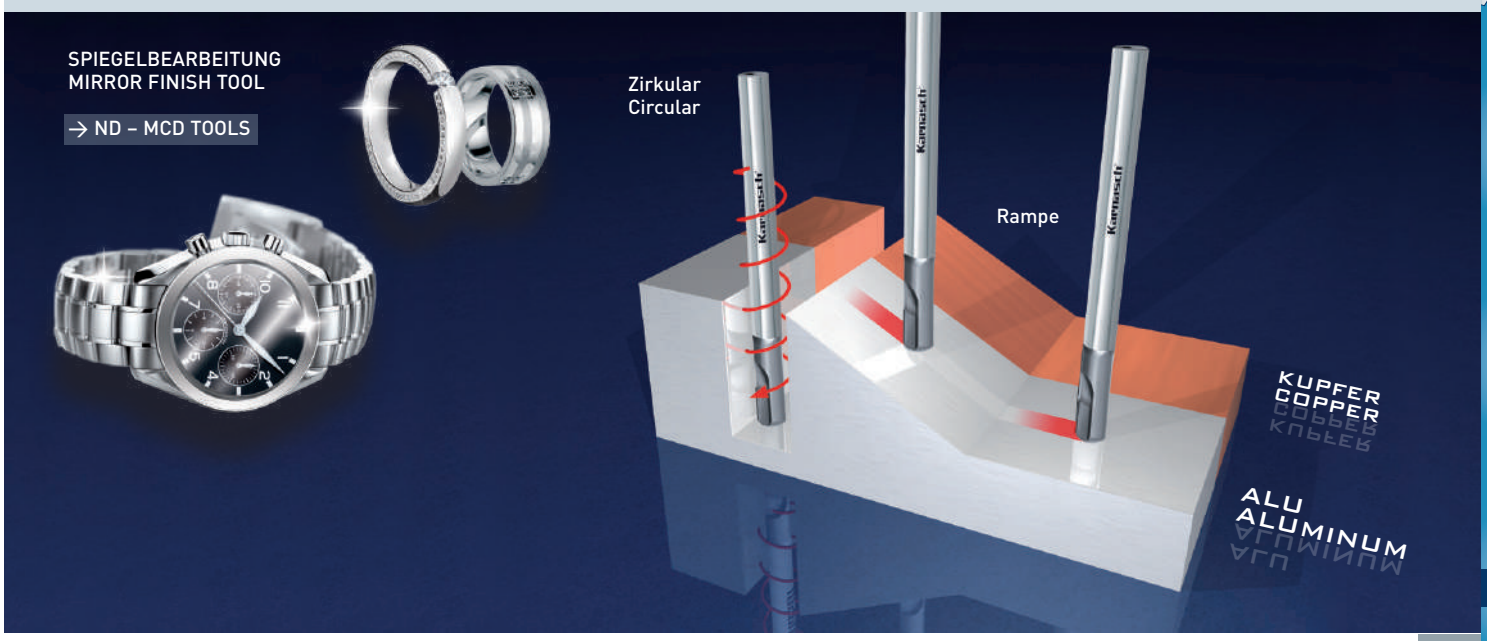
| Art. | Ø d1 ±0,03 | l2 | l3 | d2 h5 | d3 | l1 | Z |
|---|---|---|---|---|---|---|---|
| 29 6841 0100 02 | ○ 1,0 | 2 | – | 4 | – | 50 | 1 |
| 29 6841 0100 03 | ○ 1,0 | 3 | – | 4 | – | 50 | 1 |
| 29 6841 0100 04 | ○ 1,0 | 4 | – | 4 | – | 50 | 1 |
| 29 6841 0150 03 | ○ 1,5 | 3 | – | 4 | – | 50 | 1 |
| 29 6841 0150 04 | ○ 1,5 | 4 | – | 4 | – | 50 | 1 |
| 29 6841 0150 05 | ○ 1,5 | 5 | – | 4 | – | 50 | 1 |
| 29 6841 0200 03 | ○ 2,0 | 3 | – | 4 | – | 50 | 1 |
| 29 6841 0200 04 | ○ 2,0 | 4 | – | 4 | – | 50 | 1 |
| 29 6841 0200 05 | ○ 2,0 | 5 | – | 4 | – | 50 | 1 |
| 29 6841 0200 06 | ○ 2,0 | 6 | – | 4 | – | 50 | 1 |
| 29 6841 0300 03 | ○ 3,0 | 3 | – | 4 | – | 60 | 1 |
| 29 6841 0300 04 | ○ 3,0 | 4 | – | 4 | – | 60 | 1 |
| 29 6841 0300 05 | ○ 3,0 | 5 | – | 4 | – | 60 | 1 |
| 29 6841 0300 06 | ○ 3,0 | 6 | – | 4 | – | 60 | 1 |
| 29 6841 0400 03 | ○ 4,0 | 3 | 12 | 4 | 3,4 | 50 | 1 |
| 29 6841 0400 04 | ○ 4,0 | 4 | 12 | 4 | 3,4 | 50 | 1 |
| 29 6841 0400 05 | ○ 4,0 | 5 | 12 | 4 | 3,4 | 50 | 1 |
| 29 6841 0400 06 | ○ 4,0 | 6 | 12 | 4 | 3,4 | 50 | 1 |
| 29 6841 0600 03 | ○ 6,0 | 3 | 20 | 6 | 5,4 | 50 | 1 |
| 29 6841 0600 04 | ○ 6,0 | 4 | 20 | 6 | 5,4 | 50 | 1 |
| 29 6841 0600 05 | ○ 6,0 | 5 | 20 | 6 | 5,4 | 50 | 1 |
| 29 6841 0600 06 | ○ 6,0 | 6 | 20 | 6 | 5,4 | 50 | 1 |

Schnittdaten Cutting data 1413
Zeichnungen Drawings DXF/STEP

Durch Diamantpreisschwankungen empfehlen wir vor Auftragserteilung die aktuellen Preise anzufragen.
Die aktuellen Preise finden Sie in unserem Onlineshop.

Because of diamond price fluctuation, we ask you, to request the current prices, before ordering.
You will find the current prices in our online shop.

○ Keine Lagerware, Lieferzeit und Preis auf Anfrage / No stock tool. Price and delivery on request



# 29 6843

Monokristalliner Diamant/MKD-Fasensenker 45° – Hochglanz Spiegelfinish
Mono-crystalline Diamond/MKD countersink 45° – high gloss mirror finish. Balanced < 30.000 Rpm

Acryl
Acrylic

ACRYL ACRYLIC TYP GS

ACRYL ACRYLIC TYP XT

Plexiglas
acrylic glass

PMMA GS

MESSING WEICH
BRASS SOFT

KUPFER WEICH
COPPER SOFT

ALUMINIUM WEICH
ALUMINIUM SOFT

Gold
gold

Silber
silver







MKD Mono-kristallin
MCD MONOCRYSTALLINE

KARNASCH NORM

SPEZIAL
SPECIAL

DIN 6535 Form HA

0°

HSC
High-Speed-Cutting

GELÄPPT
LAPPED

45°

Air

Gewuchtet / Balanced
< 30.000 U/min.

| Art. | Ø d1 | l2 | l2 - 2 | d2 h5 | d3 | l1 | Z |
|---|---|---|---|---|---|---|---|
| 29 6843 0800 05 | • 8,0 | 5 | 3,7 | 8 | 1,0 | 60 | 1 |
| 29 6843 0950 06 | • 9,5 | 6 | 4,3 | 10 | 1,0 | 60 | 1 |
| 29 6843 1100 07 | • 11,0 | 7 | 5,1 | 12 | 1,0 | 60 | 1 |
| 29 6843 1200 08 | • 12,0 | 8 | 5,7 | 12 | 1,0 | 60 | 1 |
| 29 6843 1350 09 | • 13,5 | 9 | 6,4 | 14 | 1,0 | 60 | 1 |

Durch Diamantpreisschwankungen empfehlen wir vor Auftragserteilung die aktuellen Preise anzufragen. Die aktuellen Preise finden Sie in unserem Onlineshop.

Because of diamond price fluctuation, we ask you, to request the current prices, before ordering. You will find the current prices in our online shop.

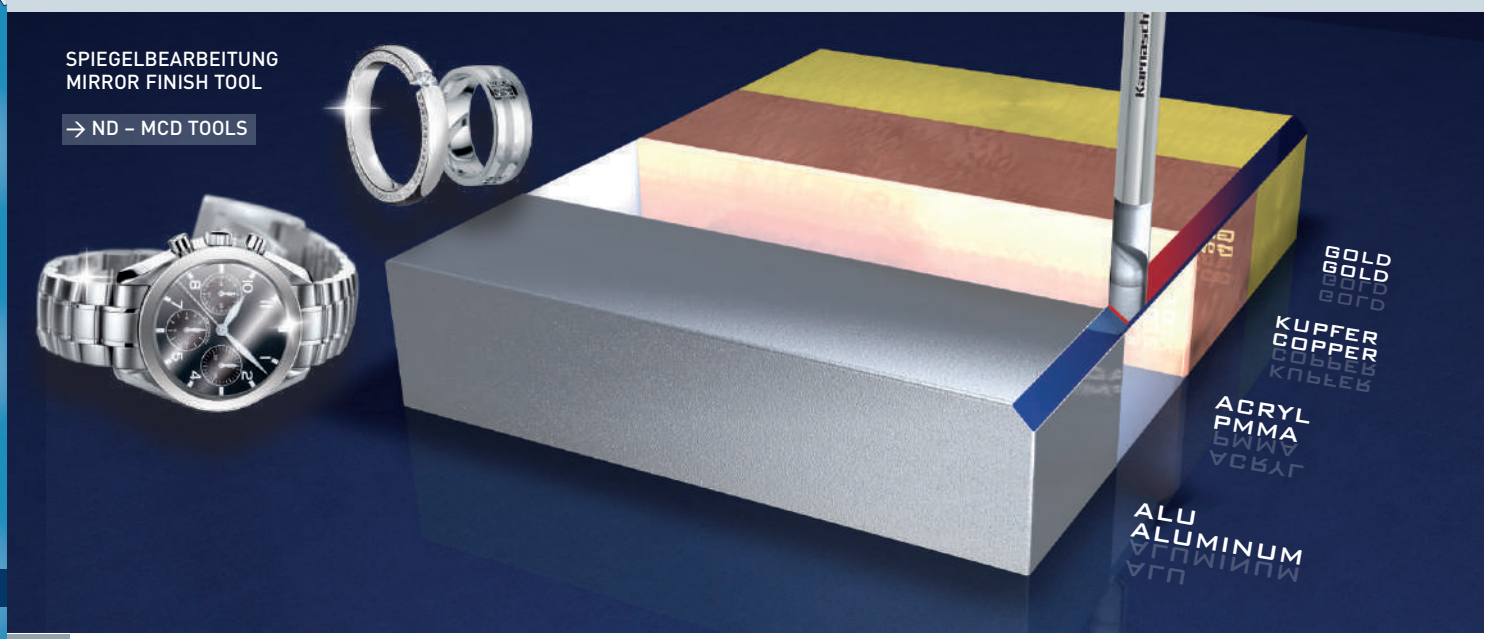
Bei Ihrer Bestellung bitten wir um Information, welches Material Sie bearbeiten um die Schneidengeometrie anzupassen.

When ordering, please inform us which material you want to machine to adjust the cutting geometry.

Schnittdaten
Cutting data
1413

Film
Movie

Zeichnungen
Drawings
DXF/STEP



# PKD-3D-Radiusfräser mit Kugelstirn, 3×D–5×D–7×D, HSC high-speed-cutting
# PCD-3D-ball milling cutter, 3×D–5×D–7×D, HSC high-speed-cutting

30 6522

Aluminium < 6% Si
Aluminium > 6% Si
MESSING brass
Kupfer copper
GFK-CFK GFRP-CFRP
GRAPHIT graphite
kurz-spanend short chip
lang-spanend long chip




Z 2

| | |
|---|---|
| d1* = Ø ≤ 3,0 | tol -0,000 / -0,010 |
| d1* = Ø 4,0 - Ø 6,0 | tol -0,000 / -0,012 |
| d1* = Ø 8,0 - Ø 10,0 | tol -0,000 / -0,015 |
| d1* = Ø 12,0 | tol -0,000 / -0,018 |

QUALITY CONTROL 100 % ONLY THE BEST

PKD EXTREME PCD EXTREME
KARNASCH NORM
SPEZIAL SPECIAL
DIN 6535 Form HA
0°
HSC High-Speed-Cutting
POLIERT POLISHED
OIL Emul MMS Air

Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1* | r ± 0,005 | l3 | d2 h6 | d3 | l1 | l2 | Z |
|---|---|---|---|---|---|---|---|---|
| 30 6522 0300 09 | • 3 | 1,5 | 9 | 6 | 2,8 | 75 | 2,5 | 2 |
| 30 6522 0300 15 | • 3 | 1,5 | 15 | 6 | 2,8 | 75 | 2,5 | 2 |
| 30 6522 0300 21 | • 3 | 1,5 | 21 | 6 | 2,8 | 75 | 2,5 | 2 |
| 30 6522 0400 12 | • 4 | 2,0 | 12 | 6 | 3,8 | 75 | 2,5 | 2 |
| 30 6522 0400 20 | • 4 | 2,0 | 20 | 6 | 3,8 | 75 | 2,5 | 2 |
| 30 6522 0400 28 | • 4 | 2,0 | 28 | 6 | 3,8 | 75 | 2,5 | 2 |
| 30 6522 0500 15 | • 5 | 2,5 | 15 | 6 | 4,9 | 75 | 3,0 | 2 |
| 30 6522 0500 25 | • 5 | 2,5 | 25 | 6 | 4,9 | 75 | 3,0 | 2 |
| 30 6522 0500 35 | • 5 | 2,5 | 35 | 6 | 4,9 | 75 | 3,0 | 2 |
| 30 6522 0600 18 | • 6 | 3,0 | 18 | 6 | 5,9 | 100 | 6,0 | 2 |
| 30 6522 0600 30 | • 6 | 3,0 | 30 | 6 | 5,9 | 100 | 6,0 | 2 |
| 30 6522 0600 42 | • 6 | 3,0 | 42 | 6 | 5,9 | 100 | 6,0 | 2 |
| 30 6522 0600 60 | • 6 | 3,0 | 60 | 6 | 5,9 | 100 | 6,0 | 2 |
| 30 6522 0800 24 | • 8 | 4,0 | 24 | 8 | 7,8 | 100 | 8,0 | 2 |
| 30 6522 0800 40 | • 8 | 4,0 | 40 | 8 | 7,8 | 100 | 8,0 | 2 |
| 30 6522 0800 60 | • 8 | 4,0 | 60 | 8 | 7,8 | 100 | 8,0 | 2 |
| 30 6522 1000 30 | • 10 | 5,0 | 30 | 10 | 9,8 | 100 | 10,0 | 2 |
| 30 6522 1000 50 | • 10 | 5,0 | 50 | 10 | 9,8 | 100 | 10,0 | 2 |
| 30 6522 1000 60 | • 10 | 5,0 | 60 | 10 | 9,8 | 105 | 10,0 | 2 |
| 30 6522 1200 36 | • 12 | 6,0 | 36 | 12 | 11,2 | 105 | 9,0 | 2 |
| 30 6522 1200 60 | • 12 | 6,0 | 60 | 12 | 11,2 | 105 | 9,0 | 2 |

Schnittdaten Cutting data
1374-1377
Zeichnungen Drawings
DXF/STEP

# 30 6523

PKD-Schaftfräser mit Eckenradius, 3×D–5×D–7×D, HSC high-speed-cutting
PCD-end mill with corner radius, 3×D–5×D–7×D, HSC high-speed-cutting

Aluminium < 6% Si
Aluminium > 6% Si
MESSING brass
Kupfer copper
GFK-CFK GFRP-CFRP
GRAPHIT graphite
kurz-spanend short chip
lang-spanend long chip




| | |
|---|---|
| d1* = Ø ≤ 3,0 | tol -0,000 / -0,010 |
| d1* = Ø 4,0 - Ø 6,0 | tol -0,000 / -0,012 |
| d1* = Ø 8,0 - Ø 10,0 | tol -0,000 / -0,015 |
| d1* = Ø 12,0 | tol -0,000 / -0,018 |

QUALITY CONTROL 100 % ONLY THE BEST

PKD EXTREME PCD EXTREME
KARNASCH NORM
SPEZIAL SPECIAL
DIN 6535 Form HA
HSC High-Speed-Cutting
POLIERT POLISHED

Schnittdaten Cutting data 1372-1377
Zeichnungen Drawings DXF/STEP

Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1* | r ± 0,005 | l3 | d2 h6 | d3 | l1 | l2 | Z |
|---|---|---|---|---|---|---|---|---|
| 30 6523 0300 03 09 | • 3 | 0,3 | 9 | 6 | 2,8 | 75 | 2,5 | 2 |
| 30 6523 0300 03 15 | • 3 | 0,3 | 15 | 6 | 2,8 | 75 | 2,5 | 2 |
| 30 6523 0300 03 21 | • 3 | 0,3 | 21 | 6 | 2,8 | 75 | 2,5 | 2 |
| 30 6523 0300 05 21 | • 3 | 0,5 | 21 | 6 | 2,8 | 75 | 2,5 | 2 |
| 30 6523 0400 03 12 | • 4 | 0,3 | 12 | 6 | 3,8 | 75 | 2,5 | 2 |
| 30 6523 0400 03 20 | • 4 | 0,3 | 20 | 6 | 3,8 | 75 | 2,5 | 2 |
| 30 6523 0400 03 28 | • 4 | 0,3 | 28 | 6 | 3,8 | 75 | 2,5 | 2 |
| 30 6523 0400 05 28 | • 4 | 0,5 | 28 | 6 | 3,8 | 75 | 2,5 | 2 |
| 30 6523 0500 03 15 | • 5 | 0,3 | 15 | 6 | 4,8 | 75 | 3,0 | 2 |
| 30 6523 0500 03 25 | • 5 | 0,3 | 25 | 6 | 4,8 | 75 | 3,0 | 2 |
| 30 6523 0500 03 35 | • 5 | 0,3 | 35 | 6 | 4,8 | 75 | 3,0 | 2 |
| 30 6523 0500 05 35 | • 5 | 0,5 | 35 | 6 | 4,8 | 75 | 3,0 | 2 |
| 30 6523 0600 03 18 | • 6 | 0,3 | 18 | 6 | 5,9 | 100 | 6,0 | 2 |
| 30 6523 0600 03 30 | • 6 | 0,3 | 30 | 6 | 5,9 | 100 | 6,0 | 2 |
| 30 6523 0600 03 42 | • 6 | 0,3 | 42 | 6 | 5,9 | 100 | 6,0 | 2 |
| 30 6523 0600 05 18 | • 6 | 0,5 | 18 | 6 | 5,9 | 100 | 6,0 | 2 |
| 30 6523 0600 05 30 | • 6 | 0,5 | 30 | 6 | 5,9 | 100 | 6,0 | 2 |
| 30 6523 0600 05 42 | • 6 | 0,5 | 42 | 6 | 5,9 | 100 | 6,0 | 2 |
| 30 6523 0600 05 60 | • 6 | 0,5 | 60 | 6 | 5,9 | 100 | 6,0 | 2 |
| 30 6523 0600 10 18 | • 6 | 1,0 | 18 | 6 | 5,9 | 100 | 6,0 | 2 |
| 30 6523 0600 10 30 | • 6 | 1,0 | 30 | 6 | 5,9 | 100 | 6,0 | 2 |
| 30 6523 0600 10 42 | • 6 | 1,0 | 42 | 6 | 5,9 | 100 | 6,0 | 2 |
| 30 6523 0800 03 24 | • 8 | 0,3 | 24 | 8 | 7,8 | 100 | 8,0 | 2 |
| 30 6523 0800 03 40 | • 8 | 0,3 | 40 | 8 | 7,8 | 100 | 8,0 | 2 |
| 30 6523 0800 05 24 | • 8 | 0,5 | 24 | 8 | 7,8 | 100 | 8,0 | 2 |
| 30 6523 0800 05 40 | • 8 | 0,5 | 40 | 8 | 7,8 | 100 | 8,0 | 2 |
| 30 6523 0800 05 60 | • 8 | 0,5 | 60 | 8 | 7,8 | 100 | 8,0 | 2 |
| 30 6523 0800 10 24 | • 8 | 1,0 | 24 | 8 | 7,8 | 100 | 8,0 | 2 |
| 30 6523 0800 10 40 | • 8 | 1,0 | 40 | 8 | 7,8 | 100 | 8,0 | 2 |
| 30 6523 0800 10 60 | • 8 | 1,0 | 60 | 8 | 7,8 | 100 | 8,0 | 2 |
| 30 6523 1000 05 30 | • 10 | 0,5 | 30 | 10 | 9,8 | 100 | 10,0 | 2 |
| 30 6523 1000 05 50 | • 10 | 0,5 | 50 | 10 | 9,8 | 100 | 10,0 | 2 |
| 30 6523 1000 05 60 | • 10 | 0,5 | 60 | 10 | 9,8 | 105 | 10,0 | 2 |
| 30 6523 1000 10 30 | • 10 | 1,0 | 30 | 10 | 9,8 | 100 | 10,0 | 2 |
| 30 6523 1000 10 50 | • 10 | 1,0 | 50 | 10 | 9,8 | 100 | 10,0 | 2 |
| 30 6523 1000 10 60 | • 10 | 1,0 | 60 | 10 | 9,8 | 105 | 10,0 | 2 |
| 30 6523 1000 15 30 | • 10 | 1,5 | 30 | 10 | 9,8 | 100 | 10,0 | 2 |
| 30 6523 1000 15 50 | • 10 | 1,5 | 50 | 10 | 9,8 | 100 | 10,0 | 2 |
| 30 6523 1200 05 36 | • 12 | 0,5 | 36 | 12 | 11,6 | 105 | 10,0 | 2 |
| 30 6523 1200 05 60 | • 12 | 0,5 | 60 | 12 | 11,6 | 105 | 10,0 | 2 |
| 30 6523 1200 10 36 | • 12 | 1,0 | 36 | 12 | 11,6 | 105 | 10,0 | 2 |
| 30 6523 1200 10 60 | • 12 | 1,0 | 60 | 12 | 11,6 | 105 | 10,0 | 2 |
| 30 6523 1200 15 36 | • 12 | 1,5 | 36 | 12 | 11,6 | 105 | 10,0 | 2 |
| 30 6523 1200 15 60 | • 12 | 1,5 | 60 | 12 | 11,6 | 105 | 10,0 | 2 |



Grampelhuber GmbH | A-4810 Gmunden/Österreich | T: +43 (0)7612-64902-0 | F: +43 (0)7612-64902-8 | mail: office@grampelhuber.at | www.grampelhuber.at

# PKD-Schaftfräser, 3×D–5×D–7×D, HSC high-speed-cutting
# PCD-end mills, 3×D–5×D–7×D, HSC high-speed-cutting

30 6524

Aluminium < 6% Si
Aluminium > 6% Si
MESSING brass
Kupfer copper
GFK-CFK GFRP-CFRP
GRAPHIT graphite
kurz-spanend short chip
lang-spanend long chip
< 12° - 0,1 / 45°




| | |
|---|---|
| d1* = Ø ≤ 3,0 | tol -0,000 / -0,010 |
| d1* = Ø 4,0 - Ø 6,0 | tol -0,000 / -0,012 |
| d1* = Ø 8,0 - Ø 10,0 | tol -0,000 / -0,015 |
| d1* = Ø 12,0 | tol -0,000 / -0,018 |

QUALITY CONTROL 100 % ONLY THE BEST

PKD EXTREME PCD EXTREME
KARNASCH NORM
SPEZIAL SPECIAL
DIN 6535 Form HA
0°
45° x 0,1
HSC High-Speed-Cutting
POLIERT POLISHED
Oil Emul MMS Air

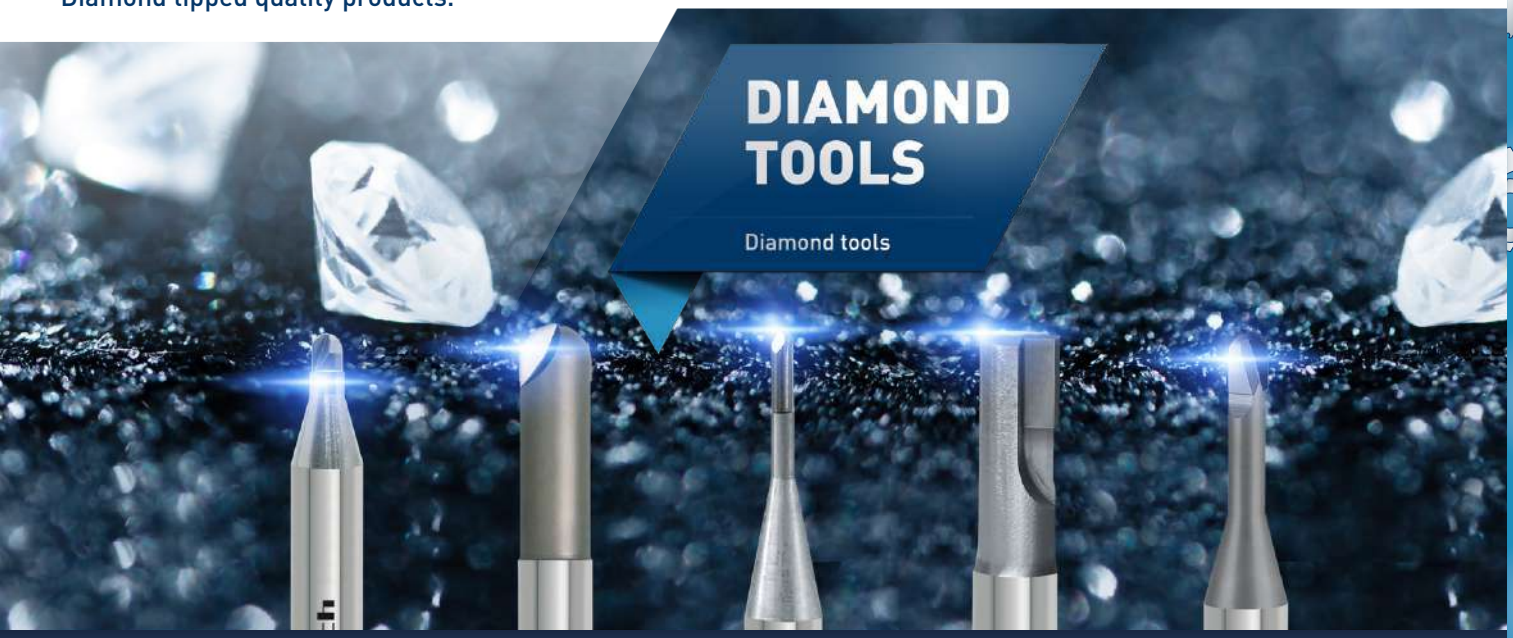
Schnittdaten Cutting data: 1372-1377
Zeichnungen Drawings: DXF/STEP

Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1* | f ±0,02 | l3 | d2 h6 | d3 | l1 | l2 | Z |
|---|---|---|---|---|---|---|---|---|
| 30 6524 0300 09 | • 3 | 0,1 | 9 | 6 | 2,9 | 75 | 2,5 | 2 |
| 30 6524 0300 15 | • 3 | 0,1 | 15 | 6 | 2,9 | 75 | 2,5 | 2 |
| 30 6524 0300 21 | • 3 | 0,1 | 21 | 6 | 2,9 | 75 | 2,5 | 2 |
| 30 6524 0400 12 | • 4 | 0,1 | 12 | 6 | 3,8 | 75 | 2,5 | 2 |
| 30 6524 0400 20 | • 4 | 0,1 | 20 | 6 | 3,8 | 75 | 2,5 | 2 |
| 30 6524 0400 28 | • 4 | 0,1 | 28 | 6 | 3,8 | 75 | 2,5 | 2 |
| 30 6524 0500 15 | • 5 | 0,1 | 15 | 6 | 4,8 | 75 | 3,0 | 2 |
| 30 6524 0500 25 | • 5 | 0,1 | 25 | 6 | 4,8 | 75 | 3,0 | 2 |
| 30 6524 0500 35 | • 5 | 0,1 | 35 | 6 | 4,8 | 75 | 3,0 | 2 |
| 30 6524 0600 18 | • 6 | 0,1 | 18 | 6 | 5,5 | 100 | 6,0 | 2 |
| 30 6524 0600 30 | • 6 | 0,1 | 30 | 6 | 5,5 | 100 | 6,0 | 2 |
| 30 6524 0600 42 | • 6 | 0,1 | 42 | 6 | 5,5 | 100 | 6,0 | 2 |
| 30 6524 0800 24 | • 8 | 0,1 | 24 | 8 | 7,4 | 100 | 7,0 | 2 |
| 30 6524 0800 40 | • 8 | 0,1 | 40 | 8 | 7,4 | 100 | 7,0 | 2 |
| 30 6524 1000 30 | • 10 | 0,1 | 30 | 10 | 9,6 | 100 | 8,0 | 2 |
| 30 6524 1000 50 | • 10 | 0,1 | 50 | 10 | 9,6 | 100 | 8,0 | 2 |
| 30 6524 1200 36 | • 12 | 0,1 | 36 | 12 | 11,6 | 105 | 9,0 | 2 |
| 30 6524 1200 60 | • 12 | 0,1 | 60 | 12 | 11,6 | 105 | 9,0 | 2 |

Diamantbestückte Qualitätsprodukte.
Diamond tipped quality products.

Karnasch® PROFESSIONAL TOOLS




CBN
PKD PCD
Naturdiamant Natural Diamond ND
Monokristallin Diamant Monocrystalline Diamond MCD
CVD / Diamant Beschichtung Diamond Coating
PKD/PCD EXTREME

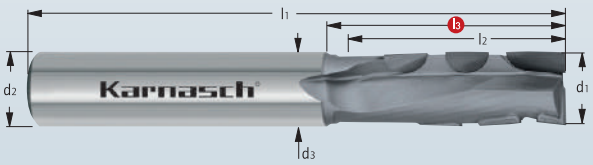
## 30 6528

PKD/PCD EXTREME

Schaftfräser Typ "V" Fräser für gradfreies Fräsen an Ober- und Unterkante von faserverstärkten Kunststoffen

PCD-Extreme type "V" mill for burr-free milling of upper and lower edge of fibre-reinforced plastics

COMPO-SITES | PEEK CF30
GFK-CFK GFRP-CFRP | GF GF25
Aramid fiber AFK-SFK | PVDF GF25
Hybrid-stoffe hybrid materials | TITAN titanium
CFK-ALU Composite CFRP-ALU Composites | Aluminium > 6% Si
Schicht-stoffe Laminates | MESSING brass
PA66 GF30 | Kupfer copper
PVDF GF30 | kurz-spanend short chip
PEEK GF30 | lang-spanend long chip




Z 2

PKD EXTREME PCD EXTREME | KARNASCH NORM
SPEZIAL SPECIAL | DIN 6535 Form HA
45° x 0,1
HPC
POLIERT POLISHED
Air

| | |
|---|---|
| d1* = Ø 10,0 | tol -0,000 / -0,022 |
| d1* = Ø 12,0 | tol -0,000 / -0,027 |

| Art. | d1 h8 | f ±0,02 | l2 | l3 | d2 h6 | d3 | l1 | Z |
|---|---|---|---|---|---|---|---|---|
| 30 6528 1000 | % 10 | 0,1 | 22 | 30 | 10 | 9,4 | 72 | 2 |
| 30 6528 1200 | % 12 | 0,1 | 26 | 36 | 12 | 11,4 | 83 | 2 |

% Sonderpreis / Sale Artikel. Lieferbar solange Vorrat.
Special price / sale article. While stocks last.




Die gleichzeitig ziehende und schiebende Anordnung der Schneiden verhindert Delamination.

Concurrent drawing and pushing blade alignment prevents delamination.

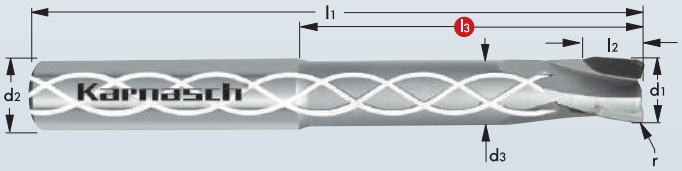
Schnittdaten Cutting data

1374-1377

## 30 6534

PKD-Eckenradiusfräser mit Innenkühlung, 3×D–5×D–7×D, positiv
PCD-Corner radius end mill, positive, with interior cooling

Aluminium < 6% Si
Aluminium > 6% Si
MESSING brass
Kupfer copper
GFK-CFK GFRP-CFRP
GRAPHIT graphite
kurz-spanend short chip
lang-spanend long chip




Z 3

PKD PCD MICRO-GRAIN | KARNASCH NORM
SPEZIAL SPECIAL | DIN 6535 Form HA
15°
HSC High-Speed-Cutting
POLIERT POLISHED
Emul. Oil MMKS Air

| Art. | d1 h7 | r ± 0,005 | l3 | d2 | d3 | l1 | l2 | Z |
|---|---|---|---|---|---|---|---|---|
| 30 6534 0600 10 18 | % 6 | 1,0 | 18 | 6 | 5,4 | 100 | 6 | 3 |
| 30 6534 0600 20 18 | % 6 | 2,0 | 18 | 6 | 5,4 | 100 | 6 | 3 |
| 30 6534 0600 10 30 | % 6 | 1,0 | 30 | 6 | 5,4 | 100 | 6 | 3 |
| 30 6534 0600 10 42 | % 6 | 1,0 | 42 | 6 | 5,4 | 100 | 6 | 3 |
| 30 6534 1200 05 36 | % 12 | 0,5 | 36 | 12 | 11,0 | 105 | 9 | 3 |
| 30 6534 1200 20 36 | % 12 | 2,0 | 36 | 12 | 11,0 | 105 | 9 | 3 |

% Sonderpreis / Sale Artikel. Lieferbar solange Vorrat.
Special price / sale article. While stocks last.

Schnittdaten Cutting data

1374-1377



Grampelhuber GmbH | A-4810 Gmunden/Österreich | T: +43 (0)7612-64902-0 | F: +43 (0)7612-64902-8 | mail: office@grampelhuber.at | www.grampelhuber.at

Dia-Cut

11 1350

GFK-CFK *GFRP-CFRP* | PA66 GF30
THERMO-PLAST THERMO-PLASTICS | PVDF GF30
DURO-PLASTE DURO-PLASTICS | PEEK GF30
Aramid fiber AFK-SFK | PEEK CF30
Hybrid-stoffe hybrid materials | GF GF25
CFK-ALU Composite CFRP-ALU Composites | PVDF GF25
Schicht-stoffe Laminates | GMT
Kevlar | SMC
Plexiglas acrylic glass | Acryl Acrylic
AL/TI | PMMA GS
TI-CFK *TI-CFRP* | Eternit

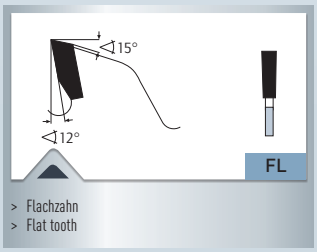



PKD PCD MICRO-GRAIN | KARNASCH NORM
SPEZIAL SPECIAL
α =12° β =15°
HSC High-Speed-Cutting
PKD PCD
Air

Maschine | Machine

Für Handkreissägen, Tauchsägen, Kapp- und Gehrungssägen, Tisch- und Formatkreissägen

For handheld circular saws, mitre saws, cross cut saws, table and sizing saws




> Flachzahn
> Flat tooth

| Art. | | | H7 | | | |
|---|---|---|---|---|---|---|
| 11 1350 120 010 | • 120 | 2,2/1,6 | 20 | 6 FL | - | - |
| 11 1350 136 010 | • 136 | 2,2/1,6 | 20 | 6 FL | 2-6-32 | - |
| 11 1350 160 005 | • 160 | 2,2/1,6 | 20/16 | 4 FL | 2-6-32,5 | - |
| 11 1350 160 010 | • 160 | 2,2/1,6 | 20/16 | 8 FL | 2-6-32,5 | - |
| 11 1350 160 020 | • 160 | 2,2/1,6 | 20/16 | 30 FL | 2-6-32,5 | - |
| 11 1350 180 010 | • 180 | 2,2/1,6 | 30/20 | 8 FL | 2-7-42 | - |
| 11 1350 190 010 | • 190 | 2,2/1,6 | 30/20 | 8 FL | 2-7-42 | ✔ |
| 11 1350 190 015 | • 190 | 2,2/1,6 | 30/20 | 12 FL | 2-7-42 | ✔ |
| 11 1350 190 020 | • 190 | 2,2/1,6 | 30/20 | 30 FL | 2-7-42 | ✔ |
| 11 1350 210 005 | • 210 | 2,2/1,6 | 30 | 8 FL | UNI | ✔ |
| 11 1350 210 010 | • 210 | 2,2/1,6 | 30 | 12 FL | UNI | ✔ |
| 11 1350 210 020 | • 210 | 2,2/1,6 | 30 | 30 FL | UNI | ✔ |
| 11 1350 216 005 | • 216 | 2,2/1,6 | 30 | 8 FL | UNI | ✔ |
| 11 1350 216 010 | • 216 | 2,2/1,6 | 30 | 12 FL | UNI | ✔ |
| 11 1350 216 020 | • 216 | 2,2/1,6 | 30 | 30 FL | UNI | ✔ |
| 11 1350 230 005 | % 230 | 2,4/1,8 | 30 | 6 FL | UNI | ✔ |
| 11 1350 230 007 | • 230 | 2,4/1,8 | 30 | 8 FL | UNI | ✔ |
| 11 1350 230 010 | • 230 | 2,4/1,8 | 30 | 15 FL | UNI | ✔ |
| 11 1350 230 020 | • 230 | 2,4/1,8 | 30 | 30 FL | UNI | ✔ |
| 11 1350 250 005 | % 250 | 2,4/1,8 | 30 | 6 FL | UNI | ✔ |
| 11 1350 250 007 | • 250 | 2,4/1,8 | 30 | 8 FL | UNI | ✔ |
| 11 1350 250 010 | • 250 | 2,4/1,8 | 30 | 16 FL | UNI | ✔ |
| 11 1350 250 015 | • 250 | 2,4/1,8 | 30 | 28 FL | UNI | ✔ |
| 11 1350 250 020 | • 250 | 2,4/1,8 | 30 | 40 FL | UNI | ✔ |
| 11 1350 250 030 | • 250 | 2,4/1,8 | 30 | 48 FL | UNI | ✔ |
| 11 1350 300 005 | • 300 | 2,6/2,0 | 30 | 8 FL | UNI | ✔ |
| 11 1350 300 015 | • 300 | 2,6/1,8 | 30 | 18 FL | UNI | ✔ |
| 11 1350 300 020 | • 300 | 2,6/2,0 | 30 | 36 FL | UNI | ✔ |
| 11 1350 300 030 | • 300 | 2,6/2,0 | 30 | 48 FL | UNI | ✔ |
| 11 1350 300 040 | • 300 | 2,6/2,0 | 30 | 60 FL | UNI | ✔ |
| 11 1350 350 002 | • 350 | 2,8/2,2 | 30 | 10 FL | UNI | ✔ |
| 11 1350 350 004 | • 350 | 2,8/2,2 | 30 | 24 FL | UNI | ✔ |
| 11 1350 350 006 | • 350 | 2,8/2,2 | 30 | 36 FL | UNI | ✔ |
| 11 1350 350 008 | • 350 | 2,8/2,2 | 30 | 48 FL | UNI | ✔ |
| 11 1350 350 010 | • 350 | 2,8/2,2 | 30 | 60 FL | UNI | ✔ |

% Sonderpreis / Sale Artikel. Lieferbar solange Vorrat. Special price / sale article. While stocks last.
UNI = 2-7-42 + 2-9-46,40 + 2-10-60