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sicZert Zertifizierungen GmbH

# Karnasch®
PROFESSIONAL TOOLS
GERMANY

## Neuheiten 2020 / 2021
## aus Gesamtkatalog GK33

HAUPTKATALOG · MAIN CATALOGUE

GÜLTIG VON 01.08.2020 - 31.07.2021

Dieser Katalog enthält alle **NEUHEITEN** aus dem mehr 1400 Seiten umfassenden ***Gesamtkatalog GK33***

**Gesamtkatalog GK33 mit 1400 Seiten hier anfordern**

**Gesamt-Katalog anfordern**




PRECISION.
PERFECTION.
PERFORMANCE.

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**mail: office@grampelhuber.at www.grampelhuber.at**

# KARNASCH NEWS

Alle neuen Werkzeuge auf einen Blick
All new tools at a glance

neu new

## VHM-Hochvorschubfräser und Schlichtfräser / Solid carbide high feed-finishing end mills


| | | |
|---|---|---|
| 30 6278 | VHM-Hochvorschubfräser und Schlichtfräser / Solid carbide high feed-finishing end mills | 68 |


## HSSX-V2 Schaftfräser / HSSX-V2 end mills


| | | |
|---|---|---|
| 44 2429 | HSSX-V2-Schaftfräser Z=3 / HSSX-V2-end mills Z=3 | 232 |
| 70 3004 | HSSX-V2-Schaftfräser – Set / HSSX-V2-end mills – set | 232 |
| 44 2469 | HSSX-V2-Feinschruppfräser Z=3 / HSSX-V2-fine roughing end mills Z=3 | 233 |
| 70 3006 | HSSX-V2-Feinschruppfräser – Set / HSSX-V2-fine roughing end mills – set | 233 |
| 44 1661 | HSSX-V2-Schaftfräser Z=4 / HSSX-V2-end mills Z=4 | 234 |
| 70 3008 | HSSX-V2-Schaftfräser – Set / HSSX-V2-end mills – set | 234 |
| 44 1663 | HSSX-V2-Feinschruppfräser Z=4 / HSSX-V2-fine roughing end mills Z=4 | 235 |
| 70 3009 | HSSX-V2-Feinschruppfräser – Set / HSSX-V2-fine roughing end mills – set | 235 |


## Lochsägen / Hole saws


| | | |
|---|---|---|
| 21 1510 | Diamant-bestreute Lochsäge / Diamond-grit hole saw | 614 |
| 21 0060 | Multidrill Lochsägen-Bohrvorrichtung / Multidrill hole saw-guide | 614 |


## Stufenbohrer + Sets / Step drills + Sets


| | | |
|---|---|---|
| 21 3050 | Stufenbohrer POWERCUT10 / Step drills POWERCUT10 | 623 |
| 21 3051 | Stufenbohrer POWERCUT10 / Step drills POWERCUT10 | 623 |
| 21 3052 | Stufenbohrer POWERCUT10 / Step drills POWERCUT10 | 623 |
| 21 3072 | Stufenbohrer-Set POWERCUT10 / Step drills set POWERCUT10 | 623 |
| 21 3053 | Spezial Leitplanken-Stufenbohrer / Special guardrail step drill | 625 |


## HSSE Co5 TIN-beschichtete Gewindebohrer / HSSE Co5 TIN-coated taps


| | | |
|---|---|---|
| 20 1820 | HSSE Co5 TIN-beschichtete Gewindebohrer (diverse Abmessungen)<br>HSSE Co5 TIN-coated taps (various sizes) | 639 |


## HSSE-V3 + HSSE-PM / HSSE-V3 + HSSE-PM


| | | |
|---|---|---|
| 20 2020 | HSSE-V3 Maschinengewindebohrer für Durchgangslöcher, gerade genutet, M3-M20<br>HSSE-V3 machine taps for through holes, straight fluted, M3-M20 | 662 |
| 20 2050 | HSSE-V3 Maschinengewindebohrer für Sacklöcher, spiralisiert, M3-M20<br>HSSE-V3 machine taps for blind holes, right hand fluted, M3-M20 | 662 |
| 20 2023 | HSSE-PM Maschinengewindebohrer für Durchgangslöcher, gerade genutet, M2-M20<br>HSSE-PM machine taps for through holes, straight fluted, M2-M20 | 663 |
| 20 2053 | HSSE-PM Maschinengewindebohrer für Sacklöcher, spiralisiert, M2-M20<br>HSSE-PM machine taps for blind holes, right hand fluted, M2-M20 | 663 |
| 20 2320 | HSSE-V3 Maschinengewindebohrer für Durchgangslöcher, gerade genutet, UNC No.4-1"<br>HSSE-V3 machine taps for through holes, straight fluted, UNC No.4-1" | 664 |
| 20 2324 | HSSE-V3 Maschinengewindebohrer für Sacklöcher, spiralisiert, UNC No.4-1"<br>HSSE-V3 machine taps for blind holes, right hand fluted, UNC No.4-1" | 664 |
| 20 2340 | HSSE-V3 Maschinengewindebohrer für Durchgangslöcher, UNF No.4-1"<br>HSSE-V3 machine taps for through holes, straight fluted, UNF No.4-1" | 665 |
| 20 2344 | HSSE-V3 Maschinengewindebohrer für Sacklöcher, spiralisiert, UNF No.4-1"<br>HSSE-V3 machine taps for blind holes, right hand fluted, UNF No.4-1" | 665 |


## Kegelsenker + Sets / Countersinks + Sets


| | | |
|---|---|---|
| 20 1747 | HSS-XE + BLUE-TEC beschichteter Kegelsenker, Ungleichteilung<br>HSS-XE + BLUE-TEC coated countersink, unequal pitch | 697 |
| 20 1691 | HSS-XE + BLUE-TEC beschichteter Kegelsenker Set / HSS-XE + BLUE-TEC coated countersink set | 697 |
| 20 1692 | HSS-XE + BLUE-TEC beschichteter Kegelsenker Set / HSS-XE + BLUE-TEC coated countersink set | 697 |
| 20 1752 | ASP-Pulverstahl BLUE-TEC beschichteter Kegelsenker, Ungleichteilung<br>ASP-powder steel BLUE-TEC coated countersink, unequal pitch | 699 |
| 20 1693 | ASP-Pulverstahl BLUE-TEC beschichteter Kegelsenker Set<br>ASP-powder steel BLUE-TEC coated countersink set | 699 |
| 20 1694 | ASP-Pulverstahl BLUE-TEC beschichteter Kegelsenker Set<br>ASP-powder steel BLUE-TEC coated countersink set | 699 |







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# KARNASCH NEWS

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All new tools at a glance

neu new

## Frässtifte + Displays + Sets / Burrs + Displays + Sets



| | | | |
|---|---|---|---|
| > 11 6090 / 11 4090 | ZYA | Frässtift Zylinder / Burr cylinder | 747 |
| > 11 6091 / 11 4091 | ZYB | Frässtift Zylinder + Stirnverzahnung / Burr cylinder + end cut | 747 |
| > 11 6092 / 11 4092 | WRC | Frässtift Walzenrundform / Burr ball nosed cylinder | 748 |
| > 11 6093 / 11 4093 | KUD | Frässtift Kugel / Burr ball | 748 |
| > 11 6094 / 11 4094 | TRE | Frässtift Tropfen / Burr oval | 749 |
| > 11 6095 / 11 4095 | RBF | Frässtift Rundbogen / Burr ball nosed tree | 749 |
| > 11 6096 / 11 4096 | SPG | Frässtift Spitzbogen / Burr tree | 750 |
| > 11 6097 / 11 4097 | - | Frässtift Flamme / Burr flame | 750 |
| > 11 6098 / 11 4098 | KEL | Frässtift Rundkegel / Burr ball nosed cone | 751 |
| > 11 6099 / 11 4099 | SKM | Frässtift Spitzkegel / Burr cone | 751 |



| | | | |
|---|---|---|---|
| > 11 3001 | ZYA | Frässtift Zylinder / Burr cylinder (diverse Abmessungen, various sizes) | 754 |
| > 11 3011 | ZYB | Frässtift Zylinder + Stirnverzahnung / Burr cylinder + end cut (div. Abmessungen, var. sizes) | 755 |
| > 11 3021 | WRC | Frässtift Walzenrundform / Burr ball nosed cylinder (diverse Abmessungen, various sizes) | 758 |
| > 11 3031 | KUD | Frässtift Kugel / Burr ball (diverse Abmessungen, various sizes) | 759 |
| > 11 3041 | TRE | Frässtift Tropfen / Burr oval (diverse Abmessungen, various sizes) | 760 |
| > 11 3051 | RBF | Frässtift Rundbogen / Burr ball nosed tree (diverse Abmessungen, various sizes) | 761 |
| > 11 3061 | SPG | Frässtift Spitzbogen / Burr tree (diverse Abmessungen, various sizes) | 762 |
| > 11 3071 | - | Frässtift Flamme / Burr flame (diverse Abmessungen, various sizes) | 763 |
| > 11 3081 | KEL | Frässtift Rundkegel / Burr ball nosed cone (diverse Abmessungen, various sizes) | 763 |
| > 11 3091 | SKM | Frässtift Spitzkegel / Burr cone (diverse Abmessungen, various sizes) | 764 |



| | | |
|---|---|---|
| > 11 4964 / 11 4964U | HP-3 PRO – 5 Stück Set 10 mm / 5 pcs set 10 mm | 872 |
| > 11 4966 / 11 4966U | HP-3 PRO – 5 Stück Set 12 mm / 5 pcs set 12 mm | 873 |
| > 11 4919U | HP-3 – 5 Stück Set 10 mm / 5 pcs set 10 mm | 874 |
| > 11 4927U | HP-3 – 5 Stück Set 12 mm / 5 pcs set 12 mm | 875 |
| > 11 4968 / 11 4968U | HP-3 PRO – 10 Stück Set 10+12 mm / 10 pcs set 10+12 mm | 877 |
| > 11 4970 / 11 4970U | HP-3 PRO – 10 Stück Set 12 mm / 10 pcs set 12 mm | 878 |
| > 11 4935U | HP-3 – 10 Stück Set 10+12 mm / 10 pcs set 10+12 mm | 879 |
| > 11 4943U | HP-3 – 10 Stück Set 12 mm / 10 pcs set 12 mm | 880 |
| > 11 4960 / 11 4960U | HP-3 PRO – 40 Stück Display / 40 pcs display | 882 |
| > 11 4854U | HP-3 – 40 Stück Display / 40 pcs display | 883 |
| > 11 4962 / 11 4962U | HP-3 PRO – 64 Stück Display / 64 pcs display | 884 |
| > 11 4856U | HP-3 – 64 Stück Display / 64 pcs display | 885 |
| > 11 4903U | HP-3 – 10 Stück Set 3 mm / 10 pcs set 3 mm | 886 |
| > 11 4838U | HP-3 – 50 Stück Set 3 mm / 50 pcs set 3 mm | 887 |



## Kreissägeblätter / Circular saw blades



| | | |
|---|---|---|
| > 11 1000 | Aluminium Positiv / Aluminum positive (diverse Abmessungen, various sizes) | 973 |
| > 11 1100 | Aluminium Negativ / Aluminum negative (diverse Abmessungen, various sizes) | 979 |

## Schmierstoffe, Schneidöl, Reiniger, Entfetter / Lubricants, cutting oil, cleaner, degreaser



| | | |
|---|---|---|
| > 60 1200 10 | Hochleistungs-Kühlschmier-Konzentrat / High performance cooling lubricant | 1212 |
| > 60 1200 25 | Hochleistungs-Kühlschmier-Konzentrat / High performance cooling lubricant | 1212 |
| > 60 1151 | Bio-Hochleistungs-Schneidöl / Bio-high-performance-cutting-oil | 1214 |
| > 60 1164 | Mineralölfreies-Hochleistungs-Minimalmengenschmieröl<br>Mineral oil free high-performance fluid | 1214 |
| > 60 1261 | Schneidöl und Minimalmengenschmieröl / Cutting oil and minumum quantity lubrication | 1214 |
| > 60 1262 | Schneidöl und Minimalmengenschmieröl / Cutting oil and minumum quantity lubrication | 1214 |
| > 60 1263 | Schneidöl und Minimalmengenschmieröl / Cutting oil and minumum quantity lubrication | 1214 |
| > 60 1264 | Schneidöl und Minimalmengenschmieröl / Cutting oil and minumum quantity lubrication | 1214 |



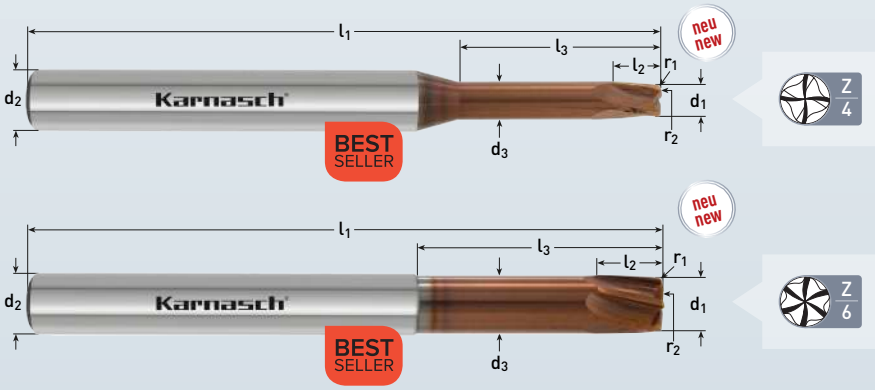
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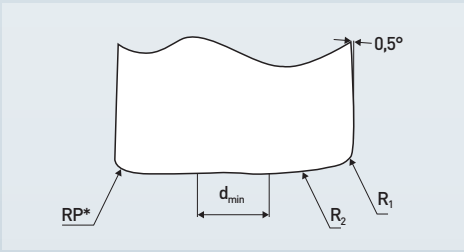
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# 30 6278

VHM-Hochvorschubfräser und Schlichtfräser
Solid carbide high feed-finishing end mills

HRC < 70
GJL
GJS
GTW GTS




MICRO GRAIN
KARNASCH NORM
SPEZIAL SPECIAL
DIN 6535 Form HA
12°
HHC HSC HPC
OBS

Schnittdaten
Cutting data
1284-1285

Zeichnungen
Drawings
DXF/STEP

* Bei der Eingabe als Radiusfräser in Ihr CAM-System, verwenden Sie bitte den RP-Wert zur Programmierung.
* When entering as a radius cutter in your CAM-system, please use the RP value for programming.

| | |
|---|---|
| d1* = Ø ≤ 3,0 | tol -0,006 / -0,020 |
| d1* = Ø 4,0 - Ø 6,0 | tol -0,010 / -0,028 |
| d1* = Ø 8,0 - Ø 10,0 | tol -0,013 / -0,035 |
| d1* = Ø 12,0 | tol -0,016 / -0,043 |

Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1 | r1 | r2 | l3 | d2 | d3 | l1 | l2 | z | RP* | d min | € |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30 6278 0200 010 06 | • 2 | 0,10 | 2,30 | 6 | 6 | 1,90 | 60 | 2 | 4 | 0,180 | 0,6 | 58,00 |
| 30 6278 0200 010 10 | • 2 | 0,10 | 2,30 | 10 | 6 | 1,90 | 60 | 2 | 4 | 0,180 | 0,6 | 60,00 |
| 30 6278 0300 015 09 | • 3 | 0,15 | 3,45 | 9 | 6 | 2,85 | 60 | 3 | 4 | 0,275 | 0,9 | 58,00 |
| 30 6278 0300 015 15 | • 3 | 0,15 | 3,45 | 15 | 6 | 2,85 | 60 | 3 | 4 | 0,275 | 0,9 | 62,00 |
| 30 6278 0400 020 12 | • 4 | 0,20 | 4,60 | 12 | 6 | 3,80 | 60 | 4 | 4 | 0,368 | 1,2 | 65,00 |
| 30 6278 0400 020 20 | • 4 | 0,20 | 4,60 | 20 | 6 | 3,80 | 60 | 4 | 4 | 0,368 | 1,2 | 67,00 |
| 30 6278 0600 030 24 | • 6 | 0,30 | 6,90 | 24 | 6 | 5,70 | 60 | 6 | 6 | 0,550 | 1,8 | 78,00 |
| 30 6278 0800 040 32 | • 8 | 0,40 | 9,20 | 32 | 8 | 7,70 | 64 | 8 | 6 | 0,740 | 2,4 | 91,00 |
| 30 6278 1000 050 40 | • 10 | 0,50 | 11,50 | 40 | 10 | 9,65 | 75 | 10 | 6 | 0,920 | 3,0 | 112,00 |
| 30 6278 1200 060 48 | • 12 | 0,60 | 13,80 | 48 | 12 | 11,60 | 100 | 12 | 6 | 1,110 | 3,6 | 145,00 |



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Karnasch®
PROFESSIONAL TOOLS

HSSX-V2 SCHAFTFRÄSER

# HSSX-V2

Die Neuauflage der Power-Serie.

KARNASCH RETRO COLLECTION
BACK FROM the 90´s
GERMAN QUALITY PRODUCT




1.4

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**T: +43 (0)7612 - 64902-0 F: +43 (0)7612 - 64902-8**
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PROFESSIONAL TOOLS

Karnasch®
PROFESSIONAL TOOLS

Qualitätsprodukte für die Metallbearbeitung.

# HSSX-V2

## Die Neuauflage der Power-Serie.

KARNASCH RETRO COLLECTION
BACK FROM the 90's



HSSX-V2
BESCHICHTET
COATED

## Der wahrscheinlich beste HSS-Fräser der Welt.

HSSX-V2 TIALN-FUTURA beschichtet, sensationell verschleißfest.

- Extrem zäh (bei HRC 68 ± 1)
- Trocken- und Nassbearbeitung
- Schnittgeschwindigkeit ca. 50 % höher als mit HSSE-Fräsern
- Deutliche Standzeiterhöhung auch bei schwer zerspanbarem Material
- Anwendungstemperatur bis max. 800° C
- Erhöhung der Verschleißbeständigkeit
- Feines Oberflächenmuster (Typ N und Typ HR) - Große Fertigungssicherheit
- Niedrige Werkzeugkosten

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1

## 44 2429

HSSX-V2-Schaftfräser
HSSX-V2-end mills

UNI
STAHL steel < 1400 N/mm²
INOX Edelstahl STAINLESS STEEL
GJL
GJS
TITAN TITANIUM < 1100 N/mm²
NE METALLE non-ferrous




neu new

HSSX-V2 BESCHICHTET COATED

Z 3

| | |
|---|---|
| d1* = Ø 6,0 | tol 0 / -0,028 |
| d1* = Ø 8,0 - Ø 10,0 | tol 0 / -0,034 |
| d1* = Ø 12,0 - Ø 16,0 | tol 0 / -0,043 |
| d1* = Ø 20,0 | tol 0 / -0,053 |

HSSX V2 | DIN 844 K-B | N | DIN 1835 Form B | 30° | HRC < 45 | TIALN-FUTURA | OIL Emul MMKS

| Art. | d1 | l2 | d2 | l1 | z | € |
|---|---|---|---|---|---|---|
| 44 2429 0600 | • 6 | 13 | 6 | 57 | 3 | 11,00 |
| 44 2429 0800 | • 8 | 19 | 10 | 69 | 3 | 13,00 |
| 44 2429 1000 | • 10 | 22 | 10 | 72 | 3 | 15,00 |
| 44 2429 1200 | • 12 | 26 | 12 | 83 | 3 | 19,00 |
| 44 2429 1600 | • 16 | 32 | 16 | 92 | 3 | 28,00 |
| 44 2429 2000 | • 20 | 38 | 20 | 104 | 3 | 39,00 |

Schnittdaten Cutting data | Zeichnungen Drawings
1345 | DXF/STEP

## 70 3004

HSSX-V2-Schaftfräser – Set
HSSX-V2-end mills – set

UNI
STAHL steel < 1400 N/mm²
INOX Edelstahl STAINLESS STEEL
GJL
GJS
TITAN TITANIUM < 1100 N/mm²
NE METALLE non-ferrous



neu new

HSSX-V2 BESCHICHTET COATED

Z 3

| | |
|---|---|
| d1* = Ø 6,0 | tol 0 / -0,028 |
| d1* = Ø 8,0 - Ø 10,0 | tol 0 / -0,034 |
| d1* = Ø 12,0 - Ø 16,0 | tol 0 / -0,043 |
| d1* = Ø 20,0 | tol 0 / -0,053 |

HSSX V2 | DIN 844 K-B | N | DIN 1835 Form B | 30° | HRC < 45 | TIALN-FUTURA | OIL Emul MMKS

| Art. | Set | € |
|---|---|---|
| 70 3004 | Set bestehend aus je 1 St. Art. 44 2429 Ø 6, 8, 10, 12, 16, 20<br>Set consisting of 1 pc. each Art. 44 2429 Ø 6, 8, 10, 12, 16, 20 | 115,00 |

Schnittdaten Cutting data | Zeichnungen Drawings
1345 | DXF/STEP



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## HSSX-V2-Feinschruppfräser
## HSSX-V2-fine roughing end mills

**44 2469**

UNI
STAHL steel < 1400 N/mm²
INOX Edelstahl STAINLESS STEEL
GJL
GJS
TITAN TITANIUM < 1100 N/mm²
NE METALLE non-ferrous




neu new

Z 3

HSSX-V2 BESCHICHTET COATED

| | |
|---|---|
| d1* = Ø 6,0 | tol +0,120 / 0 |
| d1* = Ø 8,0 - Ø 10,0 | tol +0,150 / 0 |
| d1* = Ø 12,0 - Ø 16,0 | tol +0,180 / 0 |
| d1* = Ø 20,0 | tol +0,210 / 0 |

HSSX V2 | DIN 844 K-B | HR | DIN 1835 Form B | 30° | HRC < 45 | TIALN-FUTURA | OIL Emul MMKS

| Art. | d1 | l2 | d2 | l1 | z | € |
|---|---|---|---|---|---|---|
| 44 2469 0600 | • 6 | 13 | 6 | 57 | 3 | 12,00 |
| 44 2469 0800 | • 8 | 19 | 10 | 69 | 3 | 15,00 |
| 44 2469 1000 | • 10 | 22 | 10 | 72 | 3 | 17,00 |
| 44 2469 1200 | • 12 | 26 | 12 | 83 | 3 | 20,00 |
| 44 2469 1600 | • 16 | 32 | 16 | 92 | 3 | 29,00 |
| 44 2469 2000 | • 20 | 38 | 20 | 104 | 3 | 41,00 |

Schnittdaten Cutting data 1345 | Zeichnungen Drawings DXF/STEP

## HSSX-V2-Feinschruppfräser – Set
## HSSX-V2-fine roughing end mills – set

**70 3006**

UNI
STAHL steel < 1400 N/mm²
INOX Edelstahl STAINLESS STEEL
GJL
GJS
TITAN TITANIUM < 1100 N/mm²
NE METALLE non-ferrous



neu new

Z 3

HSSX-V2 BESCHICHTET COATED

| | |
|---|---|
| d1* = Ø 6,0 | tol +0,120 / 0 |
| d1* = Ø 8,0 - Ø 10,0 | tol +0,150 / 0 |
| d1* = Ø 12,0 - Ø 16,0 | tol +0,180 / 0 |
| d1* = Ø 20,0 | tol +0,210 / 0 |

HSSX V2 | DIN 844 K-B | HR | DIN 1835 Form B | 30° | HRC < 45 | TIALN-FUTURA | OIL Emul MMKS

| Art. | Set | € |
|---|---|---|
| 70 3006 | Set bestehend aus je 1 St. Art. 44 2469 Ø 6, 8, 10, 12, 16, 20<br>Set consisting of 1 pc. each Art. 44 2469 Ø 6, 8, 10, 12, 16, 20 | 124,00 |

Schnittdaten Cutting data 1345 | Zeichnungen Drawings DXF/STEP



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1

## 44 1661

HSSX-V2-Schaftfräser
HSSX-V2-end mills

UNI
STAHL steel < 1400 N/mm²
INOX Edelstahl STAINLESS STEEL
GJL
GJS
TITAN TITANIUM < 1100 N/mm²
NE METALLE non-ferrous




neu new

Z 4

HSSX-V2 BESCHICHTET COATED

| | |
|---|---|
| d1* = Ø 6,0 | tol 0 / -0,028 |
| d1* = Ø 8,0 - Ø 10,0 | tol 0 / -0,034 |
| d1* = Ø 12,0 - Ø 16,0 | tol 0 / -0,043 |
| d1* = Ø 20,0 | tol 0 / -0,053 |

HSSX V2 | DIN 844 K-B
N | DIN 1835 Form B
30°
HRC < 45
TIALN-FUTURA
OIL Emul MMKS

| Art. | d1 | l2 | d2 | l1 | z | € |
|---|---|---|---|---|---|---|
| 44 1661 0600 | • 6 | 13 | 6 | 57 | 4 | 11,00 |
| 44 1661 0800 | • 8 | 19 | 10 | 69 | 4 | 13,00 |
| 44 1661 1000 | • 10 | 22 | 10 | 72 | 4 | 15,00 |
| 44 1661 1200 | • 12 | 26 | 12 | 83 | 4 | 19,00 |
| 44 1661 1600 | • 16 | 32 | 16 | 92 | 4 | 28,00 |
| 44 1661 2000 | • 20 | 38 | 20 | 104 | 4 | 39,00 |

Schnittdaten Cutting data
Zeichnungen Drawings
1345
DXF/STEP

## 70 3008

HSSX-V2-Schaftfräser – Set
HSSX-V2-end mills – set

UNI
STAHL steel < 1400 N/mm²
INOX Edelstahl STAINLESS STEEL
GJL
GJS
TITAN TITANIUM < 1100 N/mm²
NE METALLE non-ferrous



neu new

Z 4

HSSX-V2 BESCHICHTET COATED

| | |
|---|---|
| d1* = Ø 6,0 | tol 0 / -0,028 |
| d1* = Ø 8,0 - Ø 10,0 | tol 0 / -0,034 |
| d1* = Ø 12,0 - Ø 16,0 | tol 0 / -0,043 |
| d1* = Ø 20,0 | tol 0 / -0,053 |

HSSX V2 | DIN 844 K-B
N | DIN 1835 Form B
30°
HRC < 45
TIALN-FUTURA
OIL Emul MMKS

| Art. | Set | € |
|---|---|---|
| 70 3008 | Set bestehend aus je 1 St. Art. 44 1661 Ø 6, 8, 10, 12, 16, 20<br>Set consisting of 1 pc. each Art. 44 1661 Ø 6, 8, 10, 12, 16, 20 | 115,00 |

Schnittdaten Cutting data
Zeichnungen Drawings
1345
DXF/STEP



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## HSSX-V2-Feinschruppfräser
## HSSX-V2-fine roughing end mills

**44 1663**

UNI

STAHL steel < 1400 N/mm²

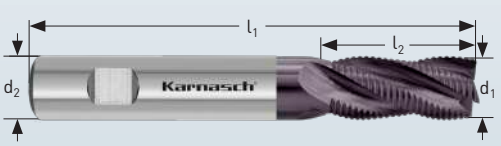
INOX Edelstahl STAINLESS STEEL

GJL

GJS

TITAN TITANIUM < 1100 N/mm²

NE METALLE non-ferrous




neu new

HSSX-V2 BESCHICHTET COATED

Z 4

| | |
|---|---|
| d1* = Ø 6,0 | tol +0,120 / 0 |
| d1* = Ø 8,0 - Ø 10,0 | tol +0,150 / 0 |
| d1* = Ø 12,0 - Ø 16,0 | tol +0,180 / 0 |
| d1* = Ø 20,0 | tol +0,210 / 0 |

HSSX V2 | DIN 844 K-B | HR | DIN 1835 Form B | 30° | HRC < 45 | TIALN-FUTURA | OIL Emul MMKS

| Art. | d1 | l2 | d2 | l1 | z | € |
|---|---|---|---|---|---|---|
| 44 1663 0600 | • 6 | 13 | 6 | 57 | 4 | 12,00 |
| 44 1663 0800 | • 8 | 19 | 10 | 69 | 4 | 15,00 |
| 44 1663 1000 | • 10 | 22 | 10 | 72 | 4 | 17,00 |
| 44 1663 1200 | • 12 | 26 | 12 | 83 | 4 | 20,00 |
| 44 1663 1600 | • 16 | 32 | 16 | 92 | 4 | 29,00 |
| 44 1663 2000 | • 20 | 38 | 20 | 104 | 4 | 41,00 |

Schnittdaten Cutting data 1345 | Zeichnungen Drawings DXF/STEP

## HSSX-V2-Feinschruppfräser – Set
## HSSX-V2-fine roughing end mills – set

**70 3009**

UNI

STAHL steel < 1400 N/mm²

INOX Edelstahl STAINLESS STEEL

GJL

GJS

TITAN TITANIUM < 1100 N/mm²

NE METALLE non-ferrous




neu new

Z 4

| | |
|---|---|
| d1* = Ø 6,0 | tol +0,120 / 0 |
| d1* = Ø 8,0 - Ø 10,0 | tol +0,150 / 0 |
| d1* = Ø 12,0 - Ø 16,0 | tol +0,180 / 0 |
| d1* = Ø 20,0 | tol +0,210 / 0 |

HSSX V2 | DIN 844 K-B | HR | DIN 1835 Form B | 30° | HRC < 45 | TIALN-FUTURA | OIL Emul MMKS

| Art. | Set | € |
|---|---|---|
| 70 3009 | Set bestehend aus je 1 St. Art. 44 1663 Ø 6, 8, 10, 12, 16, 20<br>Set consisting of 1 pc. each Art. 44 1663 Ø 6, 8, 10, 12, 16, 20 | 124,00 |

Schnittdaten Cutting data 1345 | Zeichnungen Drawings DXF/STEP



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## 21 1510 DIAMOND GRIT

Diamant-bestreute Lochsäge, Nutzlänge 30 mm / 40 mm
Diamond-grit hole saw, drill depth 30 mm / 40 mm | 1.3/16" / 1.37/64"

### ANWENDUNG · APPLICATION

| Keramik, Wandfliesen, Feinsteinzeugfliesen<br>Ceramic, wall tiles, stoneware tiles | Porzellan, Stein<br>Porcelain, stone | Mauerwerk<br>Brick & Masonry | Glas<br>Glass | Kunststoffe, Plexiglas, Glasfaser<br>Plastics, plexiglass, fibreglass |
|---|---|---|---|---|




| | |
|---|---|
| Ø 5 mm | = 30 mm |
| Ø 6–18 mm | = 40 mm |
| Ø 13/64" | = 1.3/16" |
| Ø 15/64"–45/64" | = 1.37/64" |

| Art. | Ø mm | Ø Zoll Inch | € |
|---|---|---|---|
| 21 1510 005 | 5 | 13/64" | 16,20 |
| 21 1510 006 | 6 | 15/64" | 16,50 |
| 21 1510 008 | 8 | 5/16" | 17,05 |
| 21 1510 010 | 10 | 25/64" | 17,35 |
| 21 1510 012 | 12 | 15/32" | 18,25 |
| 21 1510 014 | 14 | 35/64" | 20,35 |
| 21 1510 016 | 16 | 9/16" | 22,40 |
| 21 1510 018 | 18 | 45/64" | 23,35 |

**Achtung:** Die Zollabmessungen entsprechen nicht exakt den mm Durchmessern · **Attention:** The inch sizes do not correspond exactly to the mm diameters

### EIGENSCHAFTEN · PROPERTIES

Durch den 8,5 mm Schaft ist der Einsatz auf allen konventionellen Bohrmaschinen möglich. Geeignet für Trocken- und Nassbohrungen (Kühlung mit Wasser empfehlenswert). Alle Lochsägen mit Durchmesser 5–14 mm haben eine spezielle Kühlwachsfüllung.

**Die ideale Lochsäge für Bohrungen in schwierigsten, harten sowie abrasiven Materialien wie:**
- → Härteste keramische Fliesen
- → Alle Sorten von Stein
- → Porzellan
- → Alle Sorten von Mauerwerk
- → Glas
- → Glasfaserverstärkte / Kohlefaserverstärkte Kunststoffe (GFK /CFK)

Due to the 8,5 mm shank these hole saws can be used on all conventional drilling machines. Suitable for dry cutting and for wet cutting (cooling with water recommended). All hole saws with diameter of 5–14 mm with a special cooling wax filling.

**The ultimate hole saw for hard-to-cut materials such as:**
- → Hardest-ceramic tiles
- → All kinds of stones
- → Porcelain
- → All types of masonry
- → Glass
- → Glass fiber reinforced plastics / carbon fiber reinforced plastics (GRP / CRP)

## 21 1510 DIAMOND GRIT ZUBEHÖR · ACCESSORIES

### MULTIDRILL LOCHSÄGEN-BOHRVORRICHTUNG MIT VAKUUM SAUGFUSS
### MULTIDRILL HOLE SAW-GUIDE WITH SUCTION CUP

Ø 5-85 mm | 21 0060
● € 16,70



Vorderseite · Front side



Rückseite · Back side

Die Befestigung mittels Saugnapf (auf allen glatten Oberflächen) ermöglicht ein perfektes Zentrieren für alle Dia-Lochsägen mit Durchmesser 5–85 mm, bei horizontalen und vertikalen Bohrungen ohne Versatz der Lochsäge.
Die Multidrill-Bohrvorrichtung ermöglicht für große Lochsägendurchmesser ein Bohren ohne Zentrierbohrer.
Hohe Verschleiß- und Oxidationsbeständigkeit durch verzinkten Stahlrahmen.

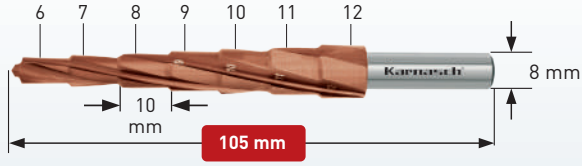
Fixing with a suction cup (on all smooth surfaces) which provides perfect centering for all Dia-Hole saws with diameter 5–85 mm, while horizontal and vertical drilling without offfset of the drill bit.
Due to the multidrill guide for lager hole saw diameters is no center drill needed anymore.
High wear- and oxidation-resistance because of the galvanized steel frame.

Schnittdaten Cutting data | Film Movie

## ANWENDUNG · APPLICATION

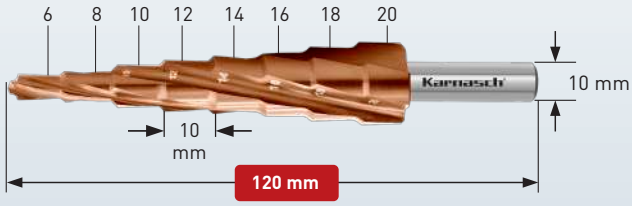
| Stahl / Steel | Edelstahl / Stainless | Grauguss / Grey cast iron | Alu / Alu | Kupfer, Messing, Zinn / Copper, brass, tin | Kunststoffe GFK/CFK / Plastics GRP/CRP |
|---|---|---|---|---|---|
| < 1100 N | < 900 N | | > 10% Si | | |

Maximale Schnitttiefe
Maximum cutting depth **10 mm**




**21 3050**
• € 25,80
neu new

Maximale Schnitttiefe
Maximum cutting depth **10 mm**




**21 3051**
• € 42,55
neu new

Maximale Schnitttiefe
Maximum cutting depth **10 mm**




**21 3052**
• € 76,15
neu new

## EIGENSCHAFTEN · PROPERTIES

- Durch die langen Stufen ergibt sich eine Schnitttiefe von bis zu 10 mm.
- Die spezielle Schneidengeometrie verringert die Bearbeitungszeit um bis zu 75 %.
- Durch die Geometrie der Spitze ist kein Ankörnen mehr nötig.
- Vorbohren entfällt, somit ist kein Werkzeugwechsel erforderlich.
- Durch die Folgestufe ist ein zusätzliches entgraten nicht mehr nötig.
- Hervorragende Bearbeitungsmöglichkeit bei schwer zugänglichen Stellen, wie z. B. T-Trägern.

- Due to the long steps results a cutting depth of up to 10 mm.
- The special cutting geometry reduces the machining time by up to 75 %.
- Due to the geometry of the tip no additional center punching necessary.
- Pre-drilling is not necessary, therefore no tool changes are required.
- Additional deburring is no longer necessary because of the subsequent step.
- Excellent processing for hard-to-reach areas, e.g. for drilling in T-beams.

### HSS-XE Stahl + TITAN-TEC beschichtet

Gefertigt aus hochlegierten Spezialstahl "XE" für wesentlich höhere Standzeit gegenüber HSS-Stähle. TITAN-TEC Beschichtung für eine nochmalige wesentliche Erhöhung der Standzeit auch bei Trockenbearbeitung (ohne/wenig Kühlung). Schneidöl empfohlen siehe ab Seite 1211.

**Die tiefgeschliffene spiralförmige Spannut bietet hohe Laufruhe und Schnittleistung. Die Späne werden wie bei einem Spiralbohrer sauber abtransportiert. Ideal für dickere Bleche ab 2 mm.**

### HSS-XE steel + TITAN-TEC coated

Made of high-alloyed special steel „XE" for considerably longer service life than HSS-Steel. TITAN-TEC coating for a further substantial increase in service life also when machining dry (no/less cooling). Cutting oil recommended, see page 1211 and following.

**The CBN ground and spiral flutes guarantee smooth running and high cutting performance. The chip flow is optimized and removed easily as with a twist drill. Ideal for thicker sheets from 2 mm.**

## STUFENBOHRER SETS · STEP DRILL SETS




Inhalt · Content
Art.
21 3050
21 3051
21 3052

neu new
**21 3072**
• € 156,65




**LEERES SET**
**EMPTY SET**

neu new
**20 1168**
• € 12,15

Schnittdaten
Cutting data
1394

Film
Movie



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## Spezial Stufenbohrer für Leitplankenmontage (6-18 mm). Gefertigt aus HSS-XE Spezialstahl + TITAN-TEC Beschichtung

- Kein Ankörnen/Vorbohren notwendig durch spezielle Bohrspitze
- Sicheres Arbeiten/bessere Kontrolle durch verlängerte Bohrstufe 12 und 18 mm
- Anschlagring verhindert durchschlagen des Stufenbohrers. Schützt Mann und Maschine.

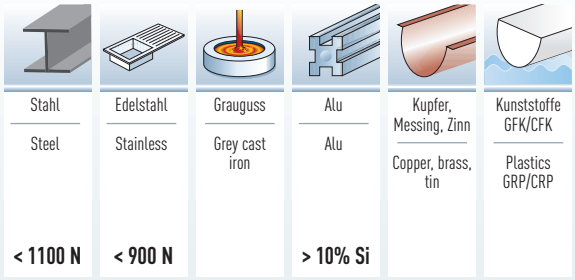
## Special step drill for guardrail assembly (6-18 mm). Made of HSS-XE special steel + TITAN-TEC coating

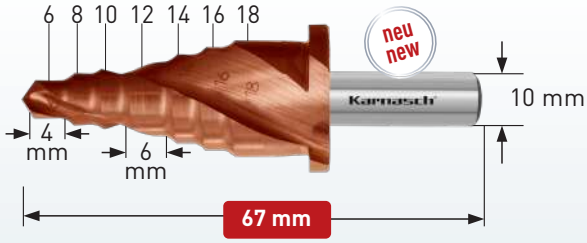
- no center-punching / pre-drilling necessary due to the special drill tip
- safe working / better control due to the extended drill step
- the stop ring prevents the step drill from slipping through. Protects man and machine.




| | |
|---|---|
| 1 Kreuzanschliff | 1 split point |
| 2 Variable Spiralnute | 2 variable spiral flute |
| 3 Verlängerte Bohrstufe 12 mm | 3 extended drill step 12 mm |
| 4 Verlängerte Bohrstufe 18 mm | 4 extended drill step 18 mm |
| 5 Anschlagring | 5 stop ring |

## ANWENDUNG · APPLICATION




**21 3053**
€ 44,55
BEST SELLER

2

## EIGENSCHAFTEN · PROPERTIES

### Spezial Stufenbohrer für Leitplankenmontage (6-18 mm). Gefertigt aus HSS-XE Spezialstahl + TITAN-TEC Beschichtung

- Speziell für Bohrungen von Leitplanken konzipiert
- 12 mm zur Montage von Holmen & Distanzstücken (verlängerte Bohrstufe 12 mm minimiert die Gefahr von unbeabsichtigten Bohrlocherweiterungen)
- 18 mm für Leitplankenholme & Kastenprofile (verlängerte Bohrstufe 18 mm ermöglicht Doppelbohrungen / 2 Leitplanken in einem Arbeitsgang)
- Anschlagring verhindert durchschlagen des Stufenbohrers bei kraftintensiven arbeiten. Schützt Mann und Maschine
- Stufenbohrer gefertigt aus HSS-XE Spezialstahl + TITAN-TEC Beschichtung für höchste Standzeiten auch bei Trockenbohrungen (Schneidöl empfohlen siehe ab Seite 1211)
- Bohrstufenhöhen bei Ø 6, 8, 10, 14, 16 = 4 mm
- Bohrstufenhöhen bei Ø 12, 18 = 6 mm
- 3-Flächenschaft (hervorragende Drehmomentübertragung, kein Durchrutschen im Bohrfutter, somit deutlich höhere Schnittleistung)

**Vorteile**
- Erhebliche Kostenreduzierung bei vollverzinkten Materialie
- Optimales Schneidverhalten durch konstante Schnittwinkel
- Kein Verkanten des Werkzeugs während des Bohrens und somit keine Hand-/Gelenkverletzungen (keine Arbeitsunfälle)

### Special step drill for guardrail assembly (6-18 mm). Made of HSS-XE special steel + TITAN-TEC coating

- specially designed for drilling in guardrail assembly
- 12 mm step for mounting spars & spacers (extended drill step 12 mm minimizes the danger of accidental drill hole enlargement)
- 18 mm step for guardrail spars & box sections (extended drill step 18 mm for double-drilling / 2 guardrails within 1 work step)
- the stop ring prevents the step drill from slipping through while powerful working. Protects man and machine.
- step drill made of high-alloyed special steel „XE" + TITAN-TEC coating for maximum service life also when machining dry (cutting oil recommended, see page 1211 and following)
- cutting depth for Ø 6, 8, 10, 14, 16 = 4 mm
- cutting depth for Ø 12, 18 = 6 mm
- 3-Flat shank (excellent torque transmission, no slippage in the drill chuck, this results to superior cutting output)

**Advantages**
- significant cost reduction for drilling fully galvanized materials
- optimal cutting behavior due to constant cutting angles
- No tilting of the drill during the cutting process, therefore no wrist joint injuries (no accidents at work)

Schnittdaten Cutting data
Film Movie



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## 20 1800

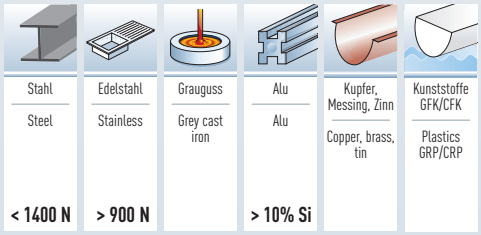
Gewindeadapter Weldonschaft
Tapping adapter Weldon shank

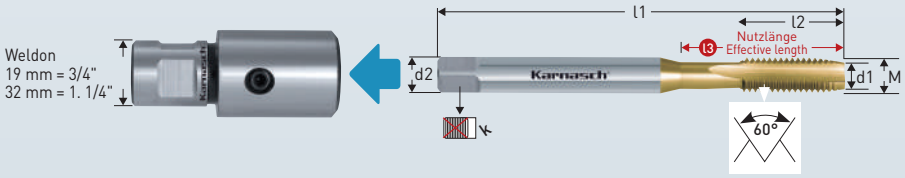
## 20 1820 DRILL-*LINE* GOLD 50

HSS-Co Cobalt + TIN-beschichtete Gewindebohrer für Durchgangslöcher. M DIN 371/376. Metrisch DIN ISO 13.

HSS-Co Cobalt + TIN coated machine taps for through holes. M DIN 371/376. Metric DIN ISO 13.

## ANWENDUNG · APPLICATION




| Weldon | Adapter · Adapter | Gewindebohrer · Taps | M | d1 Ø mm Kernloch Core hole | d2 Ø mm | l1 mm | l2 mm | l3 mm | mm | Steigung Pitch mm |
|---|---|---|---|---|---|---|---|---|---|---|
| 19 mm 3/4" | 20 1800 002 € 11,60 | 20 1820 002 € 10,20 | M 3 DIN 371 | 2,5 | 3,5 | 56 | 9 | 18 | 2,7 | 0,5 |
| 19 mm 3/4" | 20 1800 004 € 11,60 | 20 1820 004 € 10,20 | M 4 DIN 371 | 3,4 | 4,5 | 63 | 11 | 21 | 3,4 | 0,7 |
| 19 mm 3/4" | 20 1800 010 € 11,60 | 20 1820 006 € 10,45 | M 5 DIN 371 | 4,3 | 6 | 70 | 13 | 25 | 4,9 | 0,8 |
| 19 mm 3/4" | 20 1800 002 € 11,60 | NEW 20 1820 008 € 15,55 | M 5 DIN 376 | 4,3 | 3,5 | 70 | 13 | 25 | 2,7 | 0,8 |
| 19 mm 3/4" | 20 1800 010 € 11,60 | 20 1820 010 € 10,70 | M 6 DIN 371 | 5,0 | 6 | 80 | 15 | 30 | 4,9 | 1,00 |
| 19 mm 3/4" | 20 1800 004 € 11,60 | NEW 20 1820 015 € 16,05 | M 6 DIN 376 | 5,0 | 4,5 | 80 | 15 | 30 | 3,4 | 1,00 |
| 19 mm 3/4" | 20 1800 020 € 11,60 | 20 1820 020 € 13,05 | M 8 DIN 371 | 6,8 | 8 | 90 | 18 | 36 | 6,2 | 1,25 |
| 19 mm 3/4" | 20 1800 010 € 11,60 | NEW 20 1820 022 € 20,80 | M 8 DIN 376 | 6,8 | 6 | 90 | 18 | 36 | 4,9 | 1,25 |
| 19 mm 3/4" | NEW 20 1800 025 € 12,15 | NEW 20 1820 026 € 17,60 | M 10 DIN 371 | 8,5 | 10 | 100 | 20 | 35 | 8,0 | 1,50 |
| 19 mm 3/4" | 20 1800 030 € 11,60 | 20 1820 030 € 18,50 | M 10 DIN 376 | 8,5 | 7 | 100 | 20 | 63,5 | 5,5 | 1,50 |
| 19 mm 3/4" | 20 1800 040 € 12,15 | 20 1820 040 € 22,45 | M 12 DIN 376 | 10,3 | 9 | 110 | 23 | 73,5 | 7,0 | 1,75 |
| 19 mm 3/4" | 20 1800 050 € 12,15 | 20 1820 050 € 27,10 | M 14 DIN 376 | 12,0 | 11 | 110 | 25 | 79 | 9,0 | 2,00 |

Passende Bohrer Ø 2,5–12 mm siehe linke Seite Art. 20 1840. Größere Gewindebohrer siehe nächste Seite.
Suitable drills Ø 2,5–12 mm see previous page Art. 20 1840. Larger taps / drills see next page.

Zum Gewindebohren erzielen Sie hervorragende Standzeiten mit unserer universal Schneidpaste Art. 60 1159 / 60 1157, Seite 1216.
For best lifetime and performance during the tapping process, do we recommend our universal cutting paste Art. 60 1159 / 60 1157, page 1216.



Ihr Gewindebohrer ist abgebrochen und steckt im Bohrloch fest? Verwenden Sie in diesem Falle unsere Gewindebohrer-Ausbohrer. Art. 20 1860 Seite 644
Your tap is broken and is stuck in the drill hole? In that case please use our drills to remove jammed taps. See art. 20 1860 page 644

## EIGENSCHAFTEN · PROPERTIES

Cobaltstahl + TiN-Beschichtung für eine nochmalige wesentliche Erhöhung der Standzeit auch bei Trockenbearbeitung (ohne/wenig Kühlung)

Cobalt steel + TiN-coating for a further substantial increase in service life also when machining dry (no/less cooling)

Fortsetzung nächste Seite · Continued next page

## 20 2020 VALUETOOL

HSSE-V3 Maschinengewindebohrer für Durchgangslöcher, gerade genutet, metrisches ISO-Regelgewinde DIN 13

HSSE-V3 machine taps for through holes, straight fluted, ISO-thread according to DIN 13

UNI
STAHL steel < 1000 N/mm²
INOX Edelstahl STAINLESS STEEL
NE METALLE non-ferrous
Kunststoff plastic




M3-M10 DIN 371




M12-M20 DIN 376

HSSE V3 | DIN 371 376
M | ISO 2 6H
0° | 3,5-6-P Form B
60° | HET High Efficient Tap
VAPORISIERT VAPORIZED

| Art. | M | P | l1 | l2 | d2 | k | Z | Ø | € |
|---|---|---|---|---|---|---|---|---|---|
| 20 2020 03 | • M 3 | 0,50 | 56 | 9 | 3,5 | 2,7 | 3 | 2,5 | 7,00 |
| 20 2020 04 | • M 4 | 0,70 | 63 | 12 | 4,5 | 3,4 | 3 | 3,3 | 7,00 |
| 20 2020 05 | • M 5 | 0,80 | 70 | 13 | 6,0 | 4,9 | 3 | 4,2 | 7,00 |
| 20 2020 06 | • M 6 | 1,00 | 80 | 15 | 6,0 | 4,9 | 3 | 5,0 | 7,00 |
| 20 2020 08 | • M 8 | 1,25 | 90 | 18 | 8,0 | 6,2 | 3 | 6,8 | 9,00 |
| 20 2020 10 | • M 10 | 1,50 | 100 | 20 | 10,0 | 8,0 | 3 | 8,5 | 10,00 |
| 20 2020 12 | • M 12 | 1,75 | 110 | 23 | 9,0 | 7,0 | 3 | 10,2 | 12,00 |
| 20 2020 14 | • M 14 | 2,00 | 110 | 25 | 11,0 | 9,0 | 3 | 12,0 | 18,00 |
| 20 2020 16 | • M 16 | 2,00 | 110 | 25 | 12,0 | 9,0 | 3 | 14,0 | 20,00 |
| 20 2020 20 | • M 20 | 2,50 | 140 | 30 | 16,0 | 12,0 | 3 | 17,5 | 33,00 |

Gewindebohrer >M20 sind kurzfristig lieferbar.
Taps >M20 are available at short term.

Schnittdaten
Cutting data

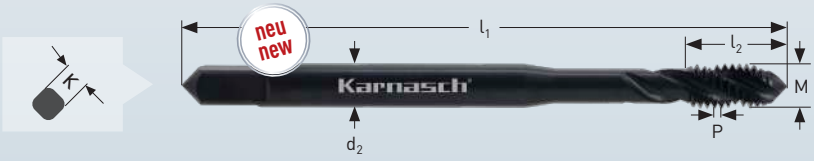
1346

## 20 2050 VALUETOOL

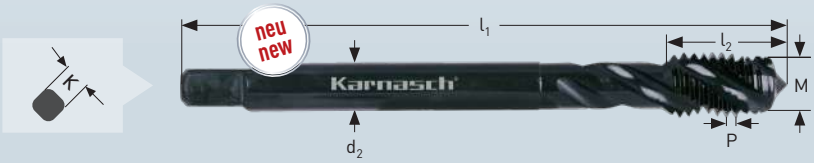
HSSE-V3 Maschinengewindebohrer für Sacklöcher, spiralisiert, metrisches ISO-Regelgewinde DIN 13

HSSE-V3 machine taps for blind holes, right hand fluted, ISO-thread according to DIN 13

UNI
STAHL steel < 1000 N/mm²
INOX Edelstahl STAINLESS STEEL
NE METALLE non-ferrous
Kunststoff plastic




M3-M10 DIN 371




M12-M20 DIN 376

HSSE V3 | DIN 371 376
M | ISO 2 6H
40° | 2-3 x P Form C
60° | HET High Efficient Tap
VAPORISIERT VAPORIZED

| Art. | M | P | l1 | l2 | d2 | k | Z | Ø | € |
|---|---|---|---|---|---|---|---|---|---|
| 20 2050 03 | • M 3 | 0,50 | 56 | 5 | 3,5 | 2,7 | 3 | 2,5 | 8,00 |
| 20 2050 04 | • M 4 | 0,70 | 63 | 7 | 4,5 | 3,4 | 3 | 3,3 | 8,00 |
| 20 2050 05 | • M 5 | 0,80 | 70 | 8 | 6,0 | 4,9 | 3 | 4,2 | 8,00 |
| 20 2050 06 | • M 6 | 1,00 | 80 | 10 | 6,0 | 4,9 | 3 | 5,0 | 8,00 |
| 20 2050 08 | • M 8 | 1,25 | 90 | 13 | 8,0 | 6,2 | 3 | 6,8 | 9,00 |
| 20 2050 10 | • M 10 | 1,50 | 100 | 15 | 10,0 | 8,0 | 3 | 8,5 | 10,00 |
| 20 2050 12 | • M 12 | 1,75 | 110 | 18 | 9,0 | 7,0 | 3 | 10,2 | 14,00 |
| 20 2050 14 | • M 14 | 2,00 | 110 | 20 | 11,0 | 9,0 | 3 | 12,0 | 19,00 |
| 20 2050 16 | • M 16 | 2,00 | 110 | 20 | 12,0 | 9,0 | 3 | 14,0 | 22,00 |
| 20 2050 20 | • M 20 | 2,50 | 140 | 25 | 16,0 | 12,0 | 3 | 17,5 | 35,00 |

Gewindebohrer >M20 sind kurzfristig lieferbar.
Taps >M20 are available at short term.

Schnittdaten
Cutting data

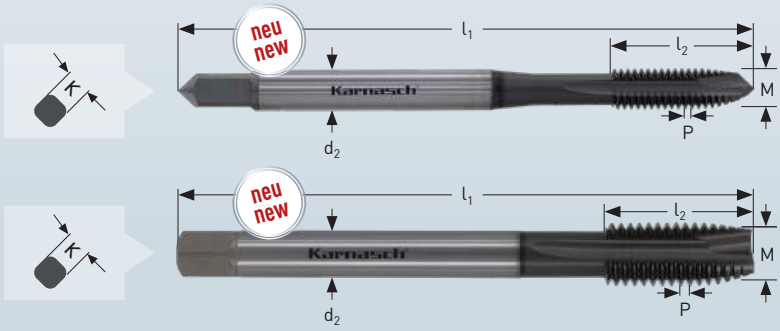
1346

## HSSE-PM Maschinengewindebohrer für Durchgangslöcher, gerade genutet, metrisches ISO-Regelgewinde DIN 13

VALUETOOL 20 2023

## HSSE-PM machine taps for through holes, straight fluted, ISO-thread according to DIN 13

HRC < 45 | TITAN titanium
STAHL steel < 1400 N/mm² | GJS
INOX stainless steel < 900 N/mm² ferritic | GFK-CFK GFRP-CFRP
INOX stainless steel > 900 N/mm² martensitic | INCONEL HASTELLOY TITANIUM
INOX stainless steel < 900 N/mm² austenitic




M3-M10 DIN 371




M12-M20 DIN 376

HSSE PM | DIN 371 376
M | ISO 2 6HX
0° | 3,5-6-P Form B
60° | HET High Efficient Tap
DVC-XN
OIL Emul

| Art. | M | P | l1 | l2 | d2 | k | Z | ⌀ | € |
|---|---|---|---|---|---|---|---|---|---|
| 20 2023 02 | • M 2 | 0,40 | 45 | 8 | 2,8 | 2,1 | 3 | 1,6 | 29,00 |
| 20 2023 025 | • M 2,5 | 0,45 | 50 | 9 | 2,8 | 2,1 | 3 | 2,05 | 29,00 |
| 20 2023 03 | • M 3 | 0,50 | 56 | 11 | 3,5 | 2,7 | 3 | 2,5 | 28,00 |
| 20 2023 04 | • M 4 | 0,70 | 63 | 13 | 4,5 | 3,4 | 3 | 3,3 | 28,00 |
| 20 2023 05 | • M 5 | 0,80 | 70 | 16 | 6,0 | 4,9 | 3 | 4,2 | 29,00 |
| 20 2023 06 | • M 6 | 1,00 | 80 | 19 | 6,0 | 4,9 | 3 | 5,0 | 30,00 |
| 20 2023 08 | • M 8 | 1,25 | 90 | 22 | 8,0 | 6,2 | 3 | 6,8 | 44,00 |
| 20 2023 10 | • M 10 | 1,50 | 100 | 24 | 10,0 | 8,0 | 3 | 8,5 | 56,00 |
| 20 2023 12 | • M 12 | 1,75 | 110 | 28 | 9,0 | 7,0 | 3 | 10,2 | 66,00 |
| 20 2023 14 | • M 14 | 2,00 | 110 | 30 | 11,0 | 9,0 | 4 | 12,0 | 91,00 |
| 20 2023 16 | • M 16 | 2,00 | 110 | 32 | 12,0 | 9,0 | 4 | 14,0 | 99,00 |
| 20 2023 20 | • M 20 | 2,50 | 140 | 34 | 16,0 | 12,0 | 4 | 17,5 | 175,00 |

Gewindebohrer >M20 sind kurzfristig lieferbar.
Taps >M20 are available at short term.

Schnittdaten
Cutting data

1346

## HSSE-PM Maschinengewindebohrer für Sacklöcher, spiralisiert, metrisches ISO-Regelgewinde DIN 13

VALUETOOL 20 2053

## HSSE-PM machine taps for blind holes, right hand fluted, ISO-thread according to DIN 13

HRC < 45 | TITAN titanium
STAHL steel < 1400 N/mm² | GJS
INOX stainless steel < 900 N/mm² ferritic | GFK-CFK GFRP-CFRP
INOX stainless steel > 900 N/mm² martensitic | INCONEL HASTELLOY TITANIUM
INOX stainless steel < 900 N/mm² austenitic




M3-M10 DIN 371




M12-M20 DIN 376

HSSE PM | DIN 371 376
M | ISO 2 6HX
50° | 2-3 x P Form C
60° | HET High Efficient Tap
DVC-XN
OIL Emul

| Art. | M | P | l1 | l2 | d2 | k | Z | ⌀ | € |
|---|---|---|---|---|---|---|---|---|---|
| 20 2053 02 | • M 2 | 0,40 | 45 | 8 | 2,8 | 2,1 | 3 | 1,6 | 33,00 |
| 20 2053 025 | • M 2,5 | 0,45 | 50 | 9 | 2,8 | 2,1 | 3 | 2,05 | 32,00 |
| 20 2053 03 | • M 3 | 0,50 | 56 | 5 | 3,5 | 2,7 | 3 | 2,5 | 30,00 |
| 20 2053 04 | • M 4 | 0,70 | 63 | 7 | 4,5 | 3,4 | 3 | 3,3 | 31,00 |
| 20 2053 05 | • M 5 | 0,80 | 70 | 8 | 6,0 | 4,9 | 3 | 4,2 | 32,00 |
| 20 2053 06 | • M 6 | 1,00 | 80 | 10 | 6,0 | 4,9 | 3 | 5,0 | 33,00 |
| 20 2053 08 | • M 8 | 1,25 | 90 | 13 | 8,0 | 6,2 | 3 | 6,8 | 40,00 |
| 20 2053 10 | • M 10 | 1,50 | 100 | 15 | 10,0 | 8,0 | 3 | 8,5 | 48,00 |
| 20 2053 12 | • M 12 | 1,75 | 110 | 18 | 9,0 | 7,0 | 3 | 10,2 | 75,00 |
| 20 2053 14 | • M 14 | 2,00 | 110 | 20 | 11,0 | 9,0 | 4 | 12,0 | 100,00 |
| 20 2053 16 | • M 16 | 2,00 | 110 | 20 | 12,0 | 9,0 | 4 | 14,0 | 100,00 |
| 20 2053 20 | • M 20 | 2,50 | 140 | 25 | 16,0 | 12,0 | 4 | 17,5 | 175,00 |

Gewindebohrer >M20 sind kurzfristig lieferbar.
Taps >M20 are available at short term.

Schnittdaten
Cutting data

1346





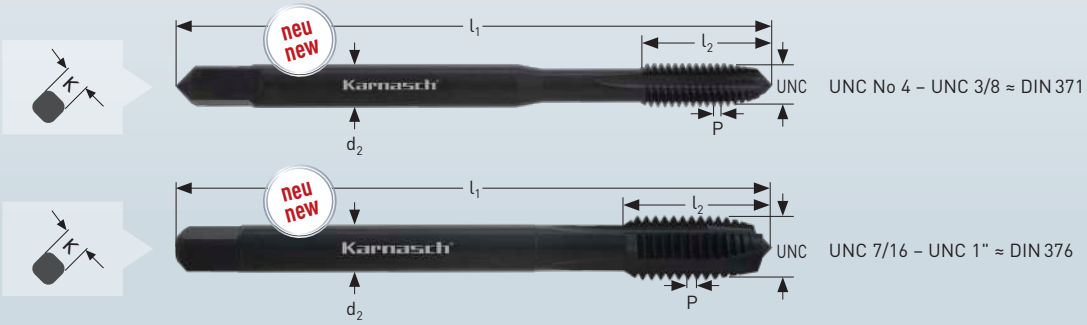
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## 20 2320 VALUETOOL

HSSE-V3 Maschinengewindebohrer für Durchgangslöcher, gerade genutet, Amerikanisches Unified-Grob-Gewinde nach ANSI B1.1

HSSE-V3 machine taps for through holes, straight fluted, american unified-national-coarse thread according to ANSI B1.1

UNI
STAHL steel < 1000 N/mm²
INOX Edelstahl STAINLESS STEEL
NE METALLE non-ferrous
Kunststoff plastic




HSSE V3 | DIN ≈371 ≈376
UNC | 2 B
4,5 - P Form B
HET High Efficient Tap
VAPORISIERT VAPORIZED

| Art. | UNC | P | l1 | l2 | d2 | k | Ø | € |
|---|---|---|---|---|---|---|---|---|
| 20 2320 04 | • No 4 | 40 | 50 | 9 | 3,5 | 2,7 | 2,35 | 16,00 |
| 20 2320 06 | • No 6 | 32 | 56 | 11 | 4,0 | 3,0 | 2,85 | 16,00 |
| 20 2320 08 | • No 8 | 32 | 63 | 12 | 4,5 | 3,4 | 3,50 | 16,00 |
| 20 2320 10 | • No 10 | 24 | 70 | 13 | 6,0 | 4,9 | 3,90 | 16,00 |
| 20 2320 12 | • No 12 | 24 | 70 | 15 | 6,0 | 4,9 | 4,50 | 16,00 |
| 20 2320 1/4 | • 1/4 | 20 | 80 | 15 | 7,0 | 5,5 | 5,20 | 16,00 |
| 20 2320 5/16 | • 5/16 | 18 | 90 | 18 | 8,0 | 6,2 | 6,60 | 20,00 |
| 20 2320 3/8 | • 3/8 | 16 | 100 | 20 | 9,0 | 7,0 | 8,00 | 23,00 |
| 20 2320 7/16 | • 7/16 | 14 | 100 | 20 | 8,0 | 6,2 | 9,40 | 26,00 |
| 20 2320 1/2 | • 1/2 | 13 | 110 | 23 | 9,0 | 7,0 | 10,80 | 26,00 |
| 20 2320 9/16 | • 9/16 | 12 | 110 | 25 | 11,0 | 9,0 | 12,20 | 37,00 |
| 20 2320 5/8 | • 5/8 | 11 | 110 | 25 | 12,0 | 9,0 | 13,50 | 37,00 |
| 20 2320 3/4 | • 3/4 | 10 | 125 | 30 | 14,0 | 11,0 | 16,50 | 81,00 |
| 20 2320 7/8 | • 7/8 | 9 | 140 | 30 | 18,0 | 14,5 | 19,50 | 90,00 |
| 20 2320 1 | • 1" | 8 | 160 | 36 | 20,0 | 16,0 | 22,25 | 95,00 |

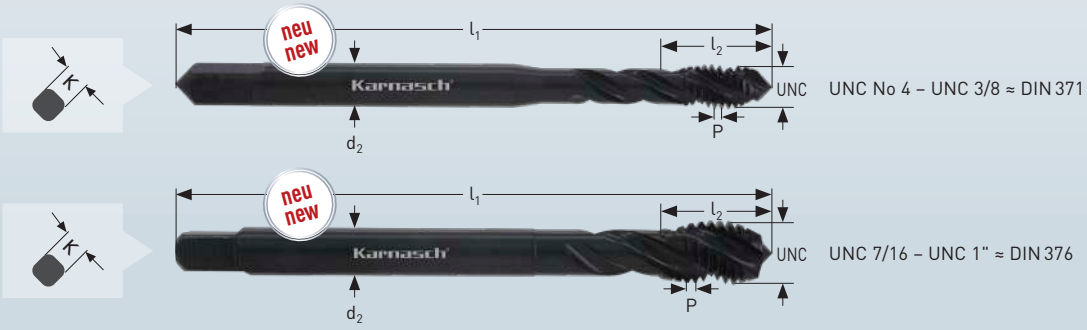
Schnittdaten
Cutting data
1346

## 20 2324 VALUETOOL

HSSE-V3 Maschinengewindebohrer für Sacklöcher, spiralisiert, Amerikanisches Unified-Grob-Gewinde nach ANSI B1.1

HSSE-V3 machine taps for blind holes, right hand fluted, american unified-national-coarse thread according to ANSI B1.1

UNI
STAHL steel < 1000 N/mm²
INOX Edelstahl STAINLESS STEEL
NE METALLE non-ferrous
Kunststoff plastic




HSSE V3 | DIN ≈371 ≈376
UNC | 2 B
2-3 x P Form C
HET High Efficient Tap
VAPORISIERT VAPORIZED

| Art. | UNC | P | l1 | l2 | d2 | k | Ø | € |
|---|---|---|---|---|---|---|---|---|
| 20 2324 04 | • No 4 | 40 | 50 | 5 | 3,5 | 2,7 | 2,35 | 19,00 |
| 20 2324 06 | • No 6 | 32 | 56 | 7 | 4,0 | 3,0 | 2,85 | 19,00 |
| 20 2324 08 | • No 8 | 32 | 63 | 7 | 4,5 | 3,4 | 3,50 | 19,00 |
| 20 2324 10 | • No 10 | 24 | 70 | 8 | 6,0 | 4,9 | 3,90 | 19,00 |
| 20 2324 12 | • No 12 | 24 | 70 | 10 | 6,0 | 4,9 | 4,50 | 19,00 |
| 20 2324 1/4 | • 1/4 | 20 | 80 | 10 | 7,0 | 5,5 | 5,20 | 19,00 |
| 20 2324 5/16 | • 5/16 | 18 | 90 | 13 | 8,0 | 6,2 | 6,60 | 24,00 |
| 20 2324 3/8 | • 3/8 | 16 | 100 | 15 | 9,0 | 7,0 | 8,00 | 27,00 |
| 20 2324 7/16 | • 7/16 | 14 | 100 | 18 | 8,0 | 6,2 | 9,40 | 28,00 |
| 20 2324 1/2 | • 1/2 | 13 | 110 | 20 | 9,0 | 7,0 | 10,80 | 28,00 |
| 20 2324 9/16 | • 9/16 | 12 | 110 | 20 | 11,0 | 9,0 | 12,20 | 41,00 |
| 20 2324 5/8 | • 5/8 | 11 | 110 | 20 | 12,0 | 9,0 | 13,50 | 41,00 |
| 20 2324 3/4 | • 3/4 | 10 | 125 | 25 | 14,0 | 11,0 | 16,50 | 88,00 |
| 20 2324 7/8 | • 7/8 | 9 | 140 | 25 | 18,0 | 14,5 | 19,50 | 98,00 |
| 20 2324 1 | • 1" | 8 | 160 | 30 | 20,0 | 16,0 | 22,25 | 104,00 |

Schnittdaten
Cutting data
1346



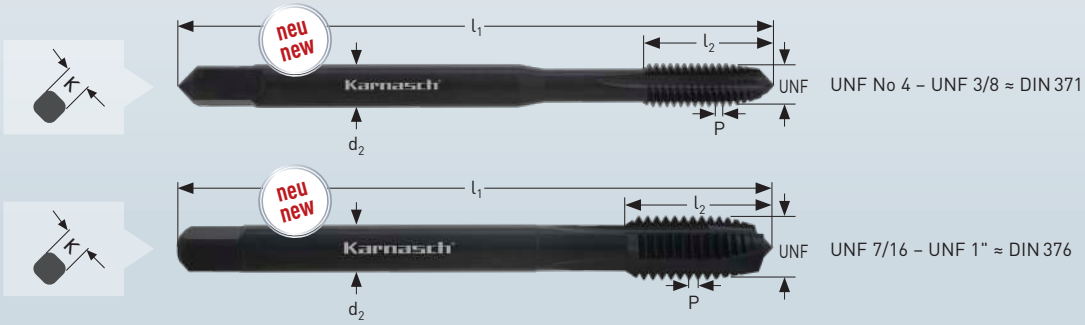
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## HSSE-V3 Maschinengewindebohrer für Durchgangslöcher, gerade genutet, Amerikanisches Unified-Fein-Gewinde nach ANSI B1.1

VALUETOOL 20 2340

HSSE-V3 machine taps for through holes, straight fluted, american unified-national-fine thread according to ANSI B1.1

UNI
STAHL steel < 1000 N/mm²
INOX Edelstahl STAINLESS STEEL
NE METALLE non-ferrous
Kunststoff plastic




UNF No 4 – UNF 3/8 ≈ DIN 371

UNF 7/16 – UNF 1" ≈ DIN 376

HSSE V3 | DIN ≈371 ≈376
UNF | 2 B
0° | 4,5 - P Form B
60° | HET High Efficient Tap
VAPORISIERT VAPORIZED

| Art. | UNF | P | l1 | l2 | d2 | k | Ø | € |
|---|---|---|---|---|---|---|---|---|
| 20 2340 04 | • No 4 | 48 | 50 | 9 | 3,5 | 6 | 2,40 | 16,00 |
| 20 2340 06 | • No 6 | 40 | 56 | 11 | 4,0 | 7 | 2,95 | 16,00 |
| 20 2340 08 | • No 8 | 36 | 63 | 12 | 4,5 | 8 | 3,50 | 16,00 |
| 20 2340 10 | • No 10 | 32 | 70 | 13 | 6,0 | 10 | 4,10 | 16,00 |
| 20 2340 12 | • No 12 | 28 | 70 | 15 | 6,0 | 10 | 4,60 | 16,00 |
| 20 2340 1/4 | • 1/4 | 28 | 80 | 15 | 7,0 | 10 | 5,50 | 17,00 |
| 20 2340 5/16 | • 5/16 | 24 | 90 | 18 | 8,0 | 10 | 6,90 | 21,00 |
| 20 2340 3/8 | • 3/8 | 24 | 100 | 20 | 9,0 | 10 | 8,50 | 23,00 |
| 20 2340 7/16 | • 7/16 | 20 | 100 | 20 | 8,0 | 13 | 9,90 | 27,00 |
| 20 2340 1/2 | • 1/2 | 20 | 100 | 21 | 9,0 | 13 | 11,50 | 27,00 |
| 20 2340 9/16 | • 9/16 | 18 | 100 | 21 | 11,0 | 15 | 12,90 | 38,00 |
| 20 2340 5/8 | • 5/8 | 18 | 100 | 21 | 12,0 | 15 | 14,50 | 38,00 |
| 20 2340 3/4 | • 3/4 | 16 | 110 | 24 | 14,0 | 17 | 17,50 | 83,00 |
| 20 2340 7/8 | • 7/8 | 14 | 140 | 24 | 18,0 | 17 | 20,40 | 93,00 |
| 20 2340 1 | • 1" | 12 | 150 | 26 | 20,0 | 20 | 23,25 | 98,00 |

Schnittdaten
Cutting data

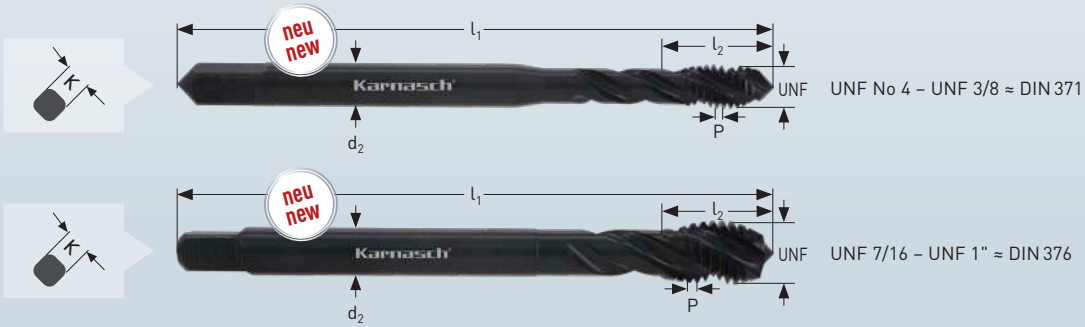
1346

## HSSE-V3 Maschinengewindebohrer für Sacklöcher, spiralisiert, Amerikanisches Unified-Fein-Gewinde nach ANSI B1.1

VALUETOOL 20 2344

HSSE-V3 machine taps for blind holes, right hand fluted, american unified-national-fine thread according to ANSI B1.1

UNI
STAHL steel < 1000 N/mm²
INOX Edelstahl STAINLESS STEEL
NE METALLE non-ferrous
Kunststoff plastic




UNF No 4 – UNF 3/8 ≈ DIN 371

UNF 7/16 – UNF 1" ≈ DIN 376

HSSE V3 | DIN ≈371 ≈376
UNF | 2 B
35° | 2-3 x P Form C
60° | HET High Efficient Tap
VAPORISIERT VAPORIZED

| Art. | UNF | P | l1 | l2 | d2 | k | Ø | € |
|---|---|---|---|---|---|---|---|---|
| 20 2344 04 | • No 4 | 48 | 50 | 5 | 3,5 | 6 | 2,40 | 19,00 |
| 20 2344 06 | • No 6 | 40 | 56 | 7 | 4,0 | 7 | 2,95 | 19,00 |
| 20 2344 08 | • No 8 | 36 | 63 | 7 | 4,5 | 8 | 3,50 | 19,00 |
| 20 2344 10 | • No 10 | 32 | 70 | 8 | 6,0 | 10 | 4,10 | 19,00 |
| 20 2344 12 | • No 12 | 28 | 70 | 10 | 6,0 | 10 | 4,60 | 19,00 |
| 20 2344 1/4 | • 1/4 | 28 | 80 | 10 | 7,0 | 10 | 5,50 | 20,00 |
| 20 2344 5/16 | • 5/16 | 24 | 90 | 13 | 8,0 | 10 | 6,90 | 25,00 |
| 20 2344 3/8 | • 3/8 | 24 | 100 | 15 | 9,0 | 10 | 8,50 | 28,00 |
| 20 2344 7/16 | • 7/16 | 20 | 100 | 15 | 8,0 | 13 | 9,90 | 29,00 |
| 20 2344 1/2 | • 1/2 | 20 | 100 | 14 | 9,0 | 13 | 11,50 | 29,00 |
| 20 2344 9/16 | • 9/16 | 18 | 100 | 16 | 11,0 | 15 | 12,90 | 42,00 |
| 20 2344 5/8 | • 5/8 | 18 | 100 | 16 | 12,0 | 15 | 14,50 | 42,00 |
| 20 2344 3/4 | • 3/4 | 16 | 110 | 20 | 14,0 | 17 | 17,50 | 92,00 |
| 20 2344 7/8 | • 7/8 | 14 | 140 | 20 | 18,0 | 17 | 20,40 | 102,00 |
| 20 2344 1 | • 1" | 12 | 150 | 22 | 20,0 | 20 | 23,25 | 108,00 |

Schnittdaten
Cutting data

1346

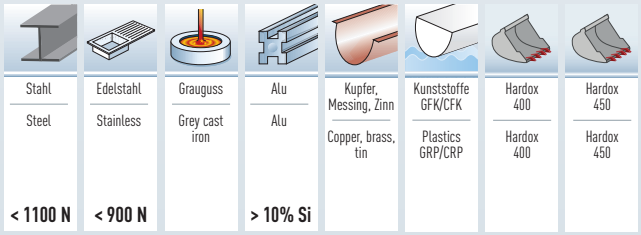


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HSS-XE + BLUE-TEC beschichteter Kegelsenker, Ungleichteilung, DIN 335 Form C 90°, 3-Flächen-Schaft
HSS-XE + BLUE-TEC coated countersink, unequal pitch, DIN 335 type C 90°, 3-flat-shank

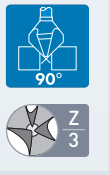
# 20 1747

## ANWENDUNG · APPLICATION










Ungleichteilung
Unequal pitch

| Art. | d1 Ø mm | d3 Ø mm | l1 mm | d2 Ø mm | Z | Senkung nach DIN 74 Countersinking per DIN 74 AF | BF | € |
|---|---|---|---|---|---|---|---|---|
| 20 1747 010 | ● 6,3 | 1,5 | 45,0 | 5,0 | 3 | – | M 3 | 20,45 |
| 20 1747 020 | ● 8,3 | 2,0 | 50,0 | 6,0 | 3 | – | M 4 | 21,10 |
| 20 1747 030 | ● 10,4 | 2,5 | 50,0 | 6,0 | 3 | – | M 5 | 22,45 |
| 20 1747 040 | ● 12,4 | 2,8 | 56,0 | 8,0 | 3 | – | M 6 | 25,05 |

| Art. | d1 Ø mm | d3 Ø mm | l1 mm | d2 Ø mm | Z | Senkung nach DIN 74 Countersinking per DIN 74 AF | BF | € |
|---|---|---|---|---|---|---|---|---|
| 20 1747 050 | ● 16,5 | 3,2 | 60,0 | 10,0 | 3 | – | M 8 | 29,10 |
| 20 1747 060 | ● 20,5 | 3,5 | 63,0 | 10,0 | 3 | – | M 10 | 31,80 |
| 20 1747 070 | ● 25,0 | 3,8 | 67,0 | 10,0 | 3 | – | M 12 | 38,55 |
| 20 1747 080 | ● 31,0 | 4,2 | 71,0 | 12,0 | 3 | – | M 16 | 48,85 |

## SETS · SETS

Inhalt
Content
**20 1691**
€ 158,85
Ø 6,3 · 8,3 · 10,4 · 12,4 · 16,5 · 20,5 mm (20 1747)




Inhalt
Content
**20 1692**
€ 151,25
Ø 6,3 · 10,4 · 16,5 · 20,5 · 25 mm (20 1747)




## LEERE SETS ZUM SELBST BESTÜCKEN
## EMPTY SETS FOR SELF EQUIPMENT

Inhalt
Content
**21 0042**
€ 8,90
Ø 6,3 · 8,3 · 10,4 · 12,4 · 16,5 · 20,5 mm




Inhalt
Content
**21 0043**
€ 8,90
Ø 6,3 · 10,4 · 16,5 · 20,5 · 25 mm




## EIGENSCHAFTEN · PROPERTIES

### HSS-XE Stahl + BLUE-TEC beschichtet

Gefertigt aus hochlegiertem Spezialstahl "XE" für wesentlich höhere Standzeiten gegenüber HSS-Stähle.
BLUE-TEC Beschichtung für eine nochmalige wesentliche Erhöhung der Standzeit auch bei Trockenbearbeitung (ohne/wenig Kühlung)

**Vorteile der extremen Ungleichteilung:**
- Hervorragende Oberflächengüte durch reduzierte Vibrationen.
- Reduzierung der Axialkraft um 50 % soweit der Radialkraft um 25 % ergibt:
  - Minimierung der Schneidkraft für ein Mehr an Standzeit.
  - Weniger Maschinenbelastung für ein Plus an Funktionsdauer.
  - Hervorragend auch für handbetriebene Anwendung
- Optimaler Spanbruch durch radialen Hinterschiff

**Zum Senken in folgende Materialien:**
- Edelstähle (V2A / V4A)
- Stahl
- Guss
- Bunt- und Leichtmetalle

3-Flächenschaft ergibt:
- Hervorragende Drehmomentübertragung
- Kein Durchrutschen im Bohrfutter
- Somit deutlich höhere Schnittleistung

### HSS-XE steel + BLUE-TEC coated

Made of high-alloyed special steel „XE" for considerably longer service life than HSS-steel.
BLUE-TEC coating for a further substantial increase in service life also when machining dry (no/less cooling)

**Advantages of the extrem unequal pitch:**
- Excellent surface quality due to reduced vibrations.
- Reduction of the axial force by 50 % and the radial force by 25 % results in:
  - Minimizing the cutting force for more tool life
  - Less machine load for a longer service life
  - Excellent for hand-operated use
- Optimal chip breaking through relief grinding

**For countersinking in materials:**
- High-alloyed chromium steel such as stainless (V2A / V4A)
- Acid resistant steel
- Steel
- Cast iron
- Non ferrous metals

3-flat shank for:
- Excellent torque transmission
- No slippage in the drill chuck
- This results to superior cutting output

Schnittdaten
Cutting data
1391

Film
Movie



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## 20 1752

ASP-Pulverstahl BLUE-TEC beschichteter Kegelsenker, Ungleichteilung, DIN 335 Form C 90°, 3-Flächen-Schaft
ASP-powder steel BLUE-TEC coated countersink, unequal pitch, DIN 335 type C 90°, 3-flat-shank

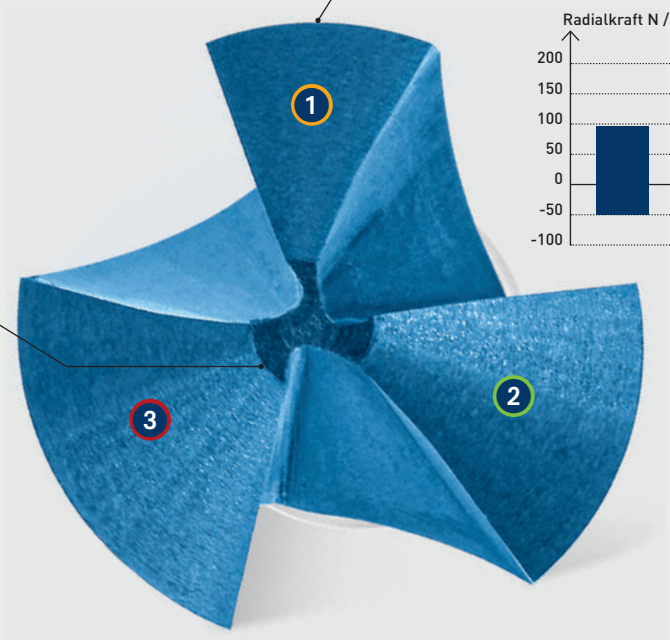
**Vorteile der extremen Ungleichteilung:**
- → Hervorragende Oberflächengüte durch reduzierte Vibrationen.
- → Reduzierung der Axialkraft um 50 % soweit der Radialkraft um 25 % ergibt:
  - – Minimierung der Schneidkraft für ein Mehr an Standzeit.
  - – Weniger Maschinenbelastung für ein Plus an Funktionsdauer.
  - – Hervorragend auch für handbetriebene Anwendung
- → Optimaler Spanbruch durch radialen Hinterschiff

**Advantages of the extrem unequal pitch:**
- → Excellent surface quality due to reduced vibrations.
- → Reduction of the axial force by 50 % and the radial force by 25 % results in:
  - – Minimizing the cutting force for more tool life
  - – Less machine load for a longer service life
  - – Excellent for hand-operated use
- → Optimal chip breaking through relief grinding

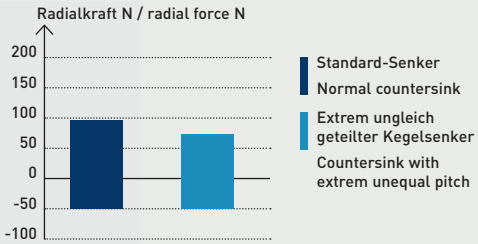
4

### Extrem ungleiche Teilung
### Extrem unequal pitch

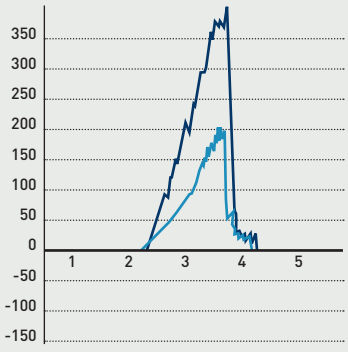



### Reduzierte Radialkraft um 25 %
### Reduced radial force by 25 %



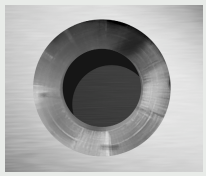

### Reduzierte Axialkraft um 50 %
### Reduced axial force by 50 %



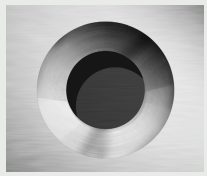

Standard-Senker
Normal countersink

Extrem ungleich geteilter Kegelsenker
Countersink with extrem unequal pitch

### Optimierte Senkung
### Optimized counterbore



Standard-Senker
Normal countersink



Extrem ungleich geteilter Kegelsenker
Countersink with extrem unequal pitch



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# ASP-Pulverstahl BLUE-TEC beschichteter Kegelsenker, Ungleichteilung, DIN 335 Form C 90°, 3-Flächen-Schaft
# ASP-powder steel BLUE-TEC coated countersink, unequal pitch, DIN 335 type C 90°, 3-flat-shank

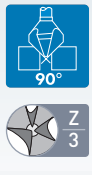
**20 1752**

## ANWENDUNG · APPLICATION










Ungleichteilung
Unequal pitch

| Art. | d1 Ø mm | d3 Ø mm | l1 mm | d2 Ø mm | Z | Senkung nach DIN 74 Countersinking per DIN 74 AF | BF | € |
|---|---|---|---|---|---|---|---|---|
| 20 1752 010 | ● 6,3 | 1,5 | 45,0 | 5,0 | 3 | – | M 3 | 39,05 |
| 20 1752 020 | ● 8,3 | 2,0 | 50,0 | 6,0 | 3 | – | M 4 | 41,90 |
| 20 1752 030 | ● 10,4 | 2,5 | 50,0 | 6,0 | 3 | – | M 5 | 46,45 |
| 20 1752 040 | ● 12,4 | 2,8 | 56,0 | 8,0 | 3 | – | M 6 | 55,65 |

| Art. | d1 Ø mm | d3 Ø mm | l1 mm | d2 Ø mm | Z | Senkung nach DIN 74 Countersinking per DIN 74 AF | BF | € |
|---|---|---|---|---|---|---|---|---|
| 20 1752 050 | ● 16,5 | 3,2 | 60,0 | 10,0 | 3 | – | M 8 | 70,10 |
| 20 1752 060 | ● 20,5 | 3,5 | 63,0 | 10,0 | 3 | – | M 10 | 76,50 |
| 20 1752 070 | ● 25,0 | 3,8 | 67,0 | 10,0 | 3 | – | M 12 | 114,40 |
| 20 1752 080 | ● 31,0 | 4,2 | 71,0 | 12,0 | 3 | – | M 16 | 144,80 |

## SETS · SETS

Inhalt / Content • **20 1693** € 338,55

Ø 6,3 · 8,3 · 10,4 · 12,4 · 16,5 · 20,5 mm (20 1752)




Inhalt / Content • **20 1694** € 355,40

Ø 6,3 · 10,4 · 16,5 · 20,5 · 25 mm (20 1752)




## LEERE SETS ZUM SELBST BESTÜCKEN
## EMPTY SETS FOR SELF EQUIPMENT

Inhalt / Content • **21 0042** € 8,90

Ø 6,3 · 8,3 · 10,4 · 12,4 · 16,5 · 20,5 mm




Inhalt / Content • **21 0043** € 8,90

Ø 6,3 · 10,4 · 16,5 · 20,5 · 25 mm




## EIGENSCHAFTEN · PROPERTIES

### ASP-Pulverstahl + BLUE-TEC beschichtet

Gefertigt aus pulvermetallurgischen Schnellarbeitsstahl. Für wesentlich höhere Standzeiten gegenüber HSS-XE Stahl.
BLUE-TEC Beschichtung für eine nochmalige wesentliche Erhöhung der Standzeit auch bei Trockenbearbeitung (ohne/wenig Kühlung)

**Vorteile der extremen Ungleichteilung:**
- Hervorragende Oberflächengüte durch reduzierte Vibrationen.
- Reduzierung der Axialkraft um 50 % soweit der Radialkraft um 25 % ergibt:
  - Minimierung der Schneidkraft für ein Mehr an Standzeit.
  - Weniger Maschinenbelastung für ein Plus an Funktionsdauer.
  - Hervorragend auch für handbetriebene Anwendung
- Optimaler Spanbruch durch radialen Hinterschiff

**Zum Senken in folgende Materialien:**
- Edelstähle (V2A / V4A)
- Rost- und säurebeständige Stähle
- Titan und Titanlegierungen
- Alle weiteren Stähle, Guss und Leichtmetalle

... wenn hohe Standzeiten erforderlich sind.

3-Flächenschaft ergibt:
- Hervorragende Drehmomentübertragung
- Kein Durchrutschen im Bohrfutter
- Somit deutlich höhere Schnittleistung

### ASP-Powder steel + BLUE-TEC coated

Made of powder metallurgy high speed steel. For considerably longer service life than HSS-XE steel.
BLUE-TEC coating for a further substantial increase in service life also when machining dry (no/less cooling)

**Advantages of the extrem unequal pitch:**
- Excellent surface quality due to reduced vibrations.
- Reduction of the axial force by 50 % and the radial force by 25 % results in:
  - Minimizing the cutting force for more tool life
  - Less machine load for a longer service life
  - Excellent for hand-operated use
- Optimal chip breaking through relief grinding

**For countersinking in materials:**
- High-alloyed chromium steel such as stainless (V2A / V4A)
- Acid resistant steel
- Titanium and titanium alloys
- All further steel sorts, cast iron,

... non ferrous metals where high tool life are desired.

3-flat shank for:
- Excellent torque transmission
- No slippage in the drill chuck
- This results to superior cutting output

Schnittdaten / Cutting data

Film / Movie





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PATENT PENDING

# HP-3 PRO/Performance 82

neu new

## Die revolutionäre neue Universal-PRO Verzahnung

+82%

Bis zu 82 % mehr Materialabtrag als unsere übliche HP-3 Universalverzahnung.
* Ist Ihnen der aggressive Materialabtrag/ Schruppen der neuen Universal-PRO Verzahnung zu stark, kann ergänzend auf unsere bewährte HP-3 Universalverzahnung zurückgegriffen werden.

Hohe Standzeit bei High-Performance.

ANTI-VIBRATION

Nahezu vibrationsfreies und kontrolliertes arbeiten möglich, selbst bei extremen Schrupparbeiten.

GREEN-TEC BESCHICHTET COATED

Erhältlich in der neuesten GREEN-TEC Beschichtungs-Technologie, für nochmalige signifikante Standzeiterhöhung.




## The revolutionary new Universal-PRO cutting style

+82%

Up to 82% more material removal than our usual HP-3 Universal cutting style.
* If the aggressive material removal / roughing of the new Universal-PRO cut appears too strong for you, please use our proven HP-3 universal cut.

Long tool life comes with high performance.

ANTI-VIBRATION

Almost vibration-free and controlled work even under tough roughing conditions possible.

GREEN-TEC BESCHICHTET COATED

Available in the latest GREEN-TEC coating technology to further increase tool life



## ANWENDUNG · APPLICATION

| Stahl / Steel | Gehärteter Stahl / Hardened steel | Edelstahl / Stainless | Gusseisen / Cast iron | Titan / Titanium | Nickel / Nickel | Kupfer, Kupferlegierungen / Copper, copper alloys | Alu / Alu |
|---|---|---|---|---|---|---|---|

Unsere neue HP-3 PRO / Performance 82 ist eine Universalverzahnung für nahezu alle Materialien.
Bitte beachten Sie, dass mit unseren Spezialverzahnungen durchaus noch höherer Materialabtrag/Standzeiten möglich sind, wie zum Beispiel:

Our new HP-3 PRO / Performance 82 is a universal cut for almost all materials. Please note that with our special cuts an even higher material removal / tool life is possible. See for example:

### Spezialverzahnungen / special cuts

**HP-9** 808-814

Speziell für Edelstahl. Extrem hohe Zerspanleistung

Especially for stainless steel. Extremely high machining output.

**HP-8** 800-806

Speziell für Stahl und Stahlguss. Extrem hohe Zerspanleistung

Especially for steel and cast steel. Extremely high machining output

**HP-7** 784-791

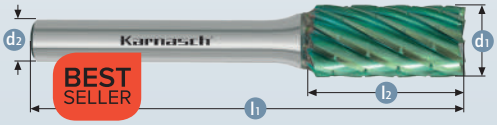
Speziell für NE-Metalle wie Alu, Kupfer, Messing sowie alle Kunststoffe

Especially for non-ferrous materials such as Aluminum, copper, brass. Also for all kinds of plastics.

## 11 6090

neu new

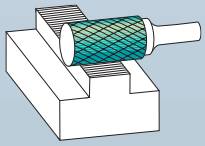
GREENTEC BESCHICHTET COATED




**A** FORM / SHAPE **ZYA**

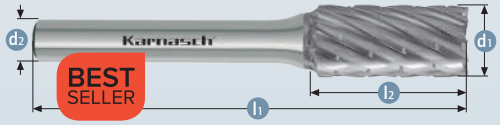
Zylinder ohne Stirnverzahnung

Cylinder without end cut



## 11 4090

neu new




Schnittdaten Cutting data

Film Movie

746

Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | € |
|---|---|---|---|---|---|---|---|
| 11 6090 010 | • 6 | 18 | 6 | 50 | | ✔ | 12,50 |
| 11 6090 020 | • 8 | 20 | 6 | 65 | ✔ | | 15,80 |
| 11 6090 030 | • 10 | 20 | 6 | 65 | ✔ | | 18,20 |
| 11 6090 040 | • 12DIN | 25 | 6 | 70 | ✔ | | 26,30 |
| 11 6090 050 | • 16 | 25 | 6 | 70 | ✔ | | 32,15 |

Bestseller – preisreduziert · Bestseller – price reduced

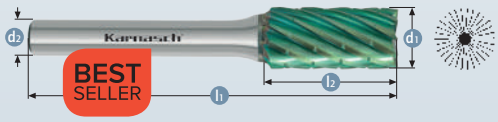
| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | € |
|---|---|---|---|---|---|---|---|
| 11 4090 010 | • 6 | 18 | 6 | 50 | | ✔ | 10,20 |
| 11 4090 020 | • 8 | 20 | 6 | 65 | ✔ | | 13,35 |
| 11 4090 030 | • 10 | 20 | 6 | 65 | ✔ | | 14,35 |
| 11 4090 040 | • 12DIN | 25 | 6 | 70 | ✔ | | 22,40 |
| 11 4090 050 | • 16 | 25 | 6 | 70 | ✔ | | 28,20 |



## 11 6091

neu new

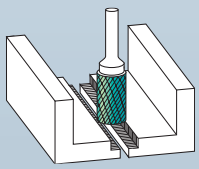
GREENTEC BESCHICHTET COATED




**B** FORM / SHAPE **ZYB**

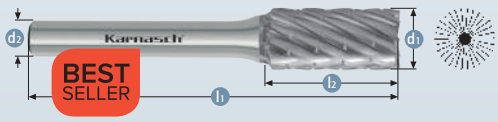
Zylinder mit Stirnverzahnung

Cylindrical with end cut



## 11 4091

neu new




Schnittdaten Cutting data

Film Movie

746

Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | € |
|---|---|---|---|---|---|---|---|
| 11 6091 010 | • 6 | 18 | 6 | 50 | | ✔ | 13,50 |
| 11 6091 020 | • 8 | 20 | 6 | 65 | ✔ | | 17,10 |
| 11 6091 030 | • 10 | 20 | 6 | 65 | ✔ | | 19,65 |
| 11 6091 040 | • 12DIN | 25 | 6 | 70 | ✔ | | 28,55 |
| 11 6091 050 | • 16 | 25 | 6 | 70 | ✔ | | 35,00 |

Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | € |
|---|---|---|---|---|---|---|---|
| 11 4091 010 | • 6 | 18 | 6 | 50 | | ✔ | 11,25 |
| 11 4091 020 | • 8 | 20 | 6 | 65 | ✔ | | 14,70 |
| 11 4091 030 | • 10 | 20 | 6 | 65 | ✔ | | 15,80 |
| 11 4091 040 | • 12DIN | 25 | 6 | 70 | ✔ | | 24,60 |
| 11 4091 050 | • 16 | 25 | 6 | 70 | ✔ | | 31,05 |

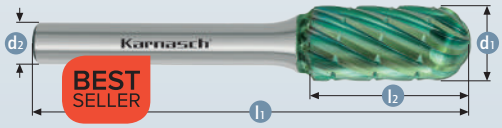


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## 11 6092

neu new

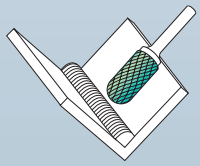
GREENTEC BESCHICHTET COATED




**C** FORM / SHAPE **WRC**

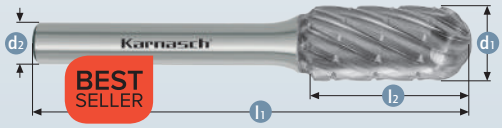
Walzenrundform

Ball nosed cylinder



## 11 4092

neu new




Schnittdaten Cutting data

Film Movie

746

Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | € |
|---|---|---|---|---|---|---|---|
| 11 6092 010 | • 6 | 18 | 6 | 50 | | ✔ | 14,15 |
| 11 6092 020 | • 8 | 20 | 6 | 65 | ✔ | | 16,95 |
| 11 6092 030 | • 10 | 20 | 6 | 65 | ✔ | | 19,80 |
| 11 6092 040 | • 12DIN | 25 | 6 | 70 | ✔ | | 29,05 |
| 11 6092 050 | • 16 | 25 | 6 | 70 | ✔ | | 35,50 |

Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | € |
|---|---|---|---|---|---|---|---|
| 11 4092 010 | • 6 | 18 | 6 | 50 | | ✔ | 11,90 |
| 11 4092 020 | • 8 | 20 | 6 | 65 | ✔ | | 14,55 |
| 11 4092 030 | • 10 | 20 | 6 | 65 | ✔ | | 16,00 |
| 11 4092 040 | • 12DIN | 25 | 6 | 70 | ✔ | | 25,10 |
| 11 4092 050 | • 16 | 25 | 6 | 70 | ✔ | | 31,60 |

## 11 6093

neu new

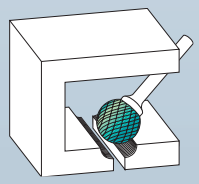
GREENTEC BESCHICHTET COATED




**D** FORM / SHAPE **KUD**

Kugel

Ball



## 11 4093

neu new




Schnittdaten Cutting data

Film Movie

746

Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | € |
|---|---|---|---|---|---|---|---|
| 11 6093 010 | • 6 | 4,8 | 6 | 50 | | ✔ | 13,20 |
| 11 6093 020 | • 8 | 7,0 | 6 | 52 | ✔ | | 14,15 |
| 11 6093 030 | • 10 | 9,0 | 6 | 54 | ✔ | | 16,95 |
| 11 6093 040 | • 12DIN | 11,0 | 6 | 56 | ✔ | | 21,65 |
| 11 6093 050 | • 16 | 14,0 | 6 | 59 | ✔ | | 25,85 |

Bestseller – preisreduziert · Bestseller – price reduced

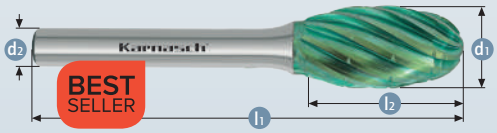
| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | € |
|---|---|---|---|---|---|---|---|
| 11 4093 010 | • 6 | 4,8 | 6 | 50 | | ✔ | 10,95 |
| 11 4093 020 | • 8 | 7,0 | 6 | 52 | ✔ | | 11,75 |
| 11 4093 030 | • 10 | 9,0 | 6 | 54 | ✔ | | 13,10 |
| 11 4093 040 | • 12DIN | 11,0 | 6 | 56 | ✔ | | 17,70 |
| 11 4093 050 | • 16 | 14,0 | 6 | 59 | ✔ | | 21,90 |





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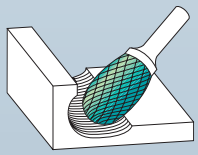
## 11 6094



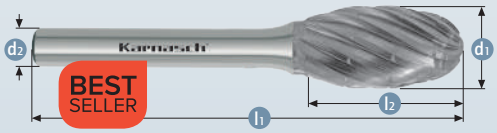

**E** FORM / SHAPE **TRE**

Tropfen

Oval



## 11 4094




Schnittdaten Cutting data 746

Film Movie

Bestseller – preisreduziert · Bestseller – price reduced

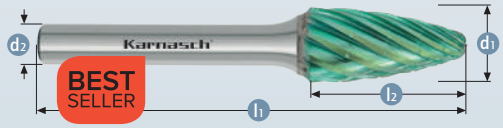
| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | € |
|---|---|---|---|---|---|---|---|
| 11 6094 010 | • 6 | 10 | 6 | 50 | | ✔ | 15,65 |
| 11 6094 020 | • 8 | 15 | 6 | 60 | ✔ | | 17,00 |
| 11 6094 030 | • 10 | 15 | 6 | 60 | ✔ | | 19,80 |
| 11 6094 040 | • 12DIN | 20 | 6 | 65 | ✔ | | 27,35 |
| 11 6094 050 | • 16 | 25 | 6 | 70 | ✔ | | 36,40 |

Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | € |
|---|---|---|---|---|---|---|---|
| 11 4094 010 | • 6 | 10 | 6 | 50 | | ✔ | 13,35 |
| 11 4094 020 | • 8 | 15 | 6 | 60 | ✔ | | 14,60 |
| 11 4094 030 | • 10 | 15 | 6 | 60 | ✔ | | 16,00 |
| 11 4094 040 | • 12DIN | 20 | 6 | 65 | ✔ | | 23,40 |
| 11 4094 050 | • 16 | 25 | 6 | 70 | ✔ | | 32,50 |



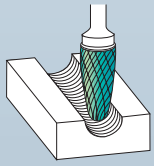
## 11 6095



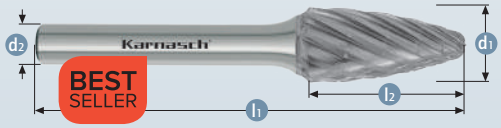

**F** FORM / SHAPE **RBF**

Rundbogen

Ball nosed tree



## 11 4095




Schnittdaten Cutting data 746

Film Movie

Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | € |
|---|---|---|---|---|---|---|---|
| 11 6095 010 | • 6 | 18 | 6 | 50 | | ✔ | 14,70 |
| 11 6095 020 | • 8 | 20 | 6 | 65 | ✔ | | 17,00 |
| 11 6095 030 | • 10 | 20 | 6 | 65 | ✔ | | 19,45 |
| 11 6095 040 | • 12DIN | 25 | 6 | 70 | ✔ | | 27,05 |
| 11 6095 050 | • 16 | 25 | 6 | 70 | ✔ | | 35,85 |

Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | € |
|---|---|---|---|---|---|---|---|
| 11 4095 010 | • 6 | 18 | 6 | 50 | | ✔ | 12,40 |
| 11 4095 020 | • 8 | 20 | 6 | 65 | ✔ | | 14,60 |
| 11 4095 030 | • 10 | 20 | 6 | 65 | ✔ | | 15,65 |
| 11 4095 040 | • 12DIN | 25 | 6 | 70 | ✔ | | 23,10 |
| 11 4095 050 | • 16 | 25 | 6 | 70 | ✔ | | 31,90 |

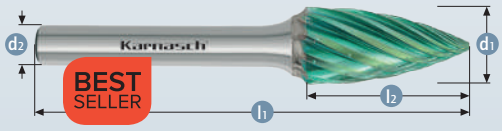


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## 11 6096

neu new

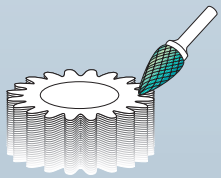
GREENTEC BESCHICHTET COATED




**G** FORM / SHAPE **SPG**

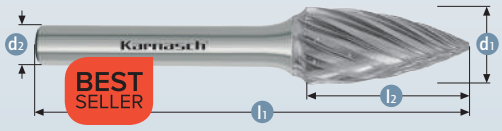
Spitzbogen

Tree



## 11 4096

neu new




Schnittdaten Cutting data | Film Movie

746

Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | € |
|---|---|---|---|---|---|---|---|
| 11 6096 010 | • 6 | 18 | 6 | 50 | | ✔ | 14,70 |
| 11 6096 020 | • 8 | 20 | 6 | 65 | ✔ | | 17,50 |
| 11 6096 030 | • 10 | 20 | 6 | 65 | ✔ | | 20,50 |
| 11 6096 040 | • 12DIN | 25 | 6 | 70 | ✔ | | 26,60 |
| 11 6096 050 | • 16 | 25 | 6 | 70 | ✔ | | 35,45 |

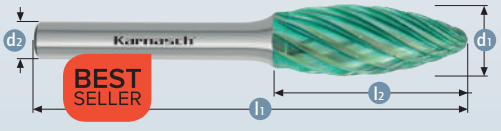
Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | € |
|---|---|---|---|---|---|---|---|
| 11 4096 010 | • 6 | 18 | 6 | 50 | | ✔ | 12,40 |
| 11 4096 020 | • 8 | 20 | 6 | 65 | ✔ | | 15,05 |
| 11 4096 030 | • 10 | 20 | 6 | 65 | ✔ | | 16,70 |
| 11 4096 040 | • 12DIN | 25 | 6 | 70 | ✔ | | 22,65 |
| 11 4096 050 | • 16 | 25 | 6 | 70 | ✔ | | 31,50 |

## 11 6097

neu new

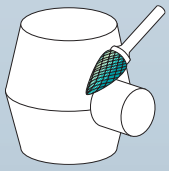
GREENTEC BESCHICHTET COATED




**H** FORM / SHAPE

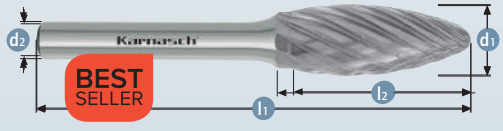
Flamme

Flame



## 11 4097

neu new




Schnittdaten Cutting data | Film Movie

746

Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | € |
|---|---|---|---|---|---|---|---|
| 11 6097 010 | • 6 | 14 | 6 | 50 | | ✔ | 14,70 |
| 11 6097 020 | • 8 | 20 | 6 | 65 | ✔ | | 18,85 |
| 11 6097 030 | • 10 | 20 | 6 | 65 | ✔ | | 32,40 |
| 11 6097 040 | • 12DIN | 30 | 6 | 75 | ✔ | | 37,40 |
| 11 6097 050 | • 16 | 35 | 6 | 80 | ✔ | | 50,15 |

Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | € |
|---|---|---|---|---|---|---|---|
| 11 4097 010 | • 6 | 14 | 6 | 50 | | ✔ | 12,40 |
| 11 4097 020 | • 8 | 20 | 6 | 65 | ✔ | | 16,40 |
| 11 4097 030 | • 10 | 20 | 6 | 65 | ✔ | | 28,45 |
| 11 4097 040 | • 12DIN | 30 | 6 | 75 | ✔ | | 33,45 |
| 11 4097 050 | • 16 | 35 | 6 | 80 | ✔ | | 46,20 |



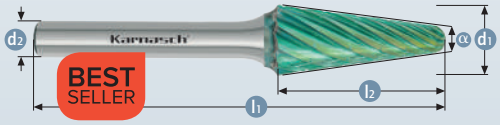


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## 11 6098

neu new

GREENTEC BESCHICHTET COATED




**L** FORM / SHAPE **KEL**

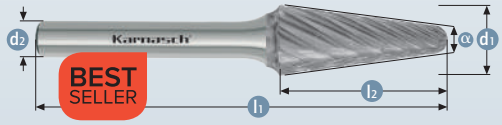
Rundkegel

Ball nosed cone



## 11 4098

neu new




Schnittdaten Cutting data 746

Film Movie

Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | α° | € |
|---|---|---|---|---|---|---|---|---|
| 11 6098 010 | • 6 | 18 | 6 | 50 | | ✔ | 14° | 15,00 |
| 11 6098 020 | • 8 | 25 | 6 | 70 | ✔ | | 14° | 19,05 |
| 11 6098 030 | • 10 | 20 | 6 | 65 | ✔ | | 14° | 19,90 |
| 11 6098 040 | • 12DIN | 30 | 6 | 75 | ✔ | | 14° | 28,35 |
| 11 6098 050 | • 16 | 33 | 6 | 78 | ✔ | | 14° | 47,15 |

Bestseller – preisreduziert · Bestseller – price reduced

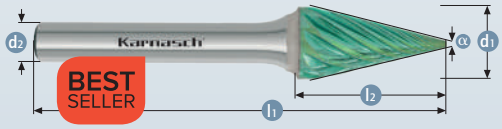
| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | α° | € |
|---|---|---|---|---|---|---|---|---|
| 11 4098 010 | • 6 | 18 | 6 | 50 | | ✔ | 14° | 12,70 |
| 11 4098 020 | • 8 | 25 | 6 | 70 | ✔ | | 14° | 16,65 |
| 11 4098 030 | • 10 | 20 | 6 | 65 | ✔ | | 14° | 16,00 |
| 11 4098 040 | • 12DIN | 30 | 6 | 75 | ✔ | | 14° | 24,40 |
| 11 4098 050 | • 16 | 33 | 6 | 78 | ✔ | | 14° | 43,20 |



## 11 6099

neu new

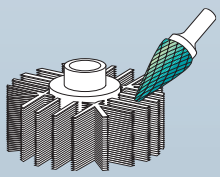
GREENTEC BESCHICHTET COATED




**M** FORM / SHAPE **SKM**

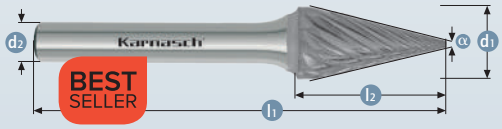
Spitzkegel

Cone



## 11 4099

neu new




Schnittdaten Cutting data 746

Film Movie

Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | α° | € |
|---|---|---|---|---|---|---|---|---|
| 11 6099 010 | • 6 | 18 | 6 | 50 | | ✔ | 14° | 15,00 |
| 11 6099 020 | • 8 | 20 | 6 | 65 | ✔ | | 13° | 20,95 |
| 11 6099 030 | • 10 | 20 | 6 | 65 | ✔ | | 28° | 23,95 |
| 11 6099 040 | • 12DIN | 26 | 6 | 71 | ✔ | | 28° | 29,00 |
| 11 6099 050 | • 16 | 25 | 6 | 70 | ✔ | | 33° | 37,40 |

Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | α° | € |
|---|---|---|---|---|---|---|---|---|
| 11 4099 010 | • 6 | 18 | 6 | 50 | | ✔ | 14° | 12,70 |
| 11 4099 020 | • 8 | 20 | 6 | 65 | ✔ | | 13° | 18,55 |
| 11 4099 030 | • 10 | 20 | 6 | 65 | ✔ | | 28° | 20,05 |
| 11 4099 040 | • 12DIN | 26 | 6 | 71 | ✔ | | 28° | 25,05 |
| 11 4099 050 | • 16 | 25 | 6 | 70 | ✔ | | 33° | 33,45 |

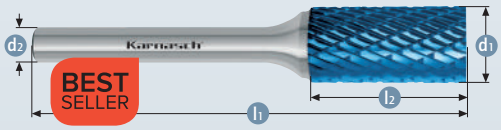


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11 5001

11 3001

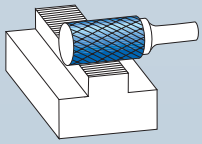
BLUETEC BESCHICHTET COATED

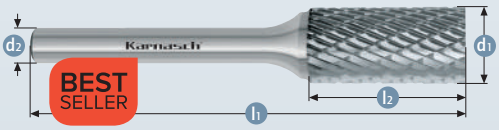



**A** FORM / SHAPE **ZYA**

Zylinder ohne Stirnverzahnung

Cylinder without end cut






NEW VALUETOOL

Schnittdaten Cutting data

Film Movie

753

Bestseller – preisreduziert · Bestseller – price reduced

Valuetool – hervorragendes Preis-Leistungs-Verhältnis
Valuetool – excellent price-performance ratio

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | € |
|---|---|---|---|---|---|---|---|
| 11 5001 015 | • 1,5 | 6 | 3 | 38 | | ✔ | 7,60 |
| 11 5001 025 | • 2 | 11 | 3 | 38 | | ✔ | 7,60 |
| 11 5001 027 | • 2,5 | 11 | 3 | 38 | | ✔ | 7,60 |
| 11 5001 030 | • 3 | 14 | 3 | 38 | | ✔ | 7,60 |
| | | | | | | | |
| 11 5001 035 | • 3 | 14 | 3 | 50 | | ✔ | 8,95 |
| 11 5001 040 | • 3 | 14 | 3 | 65 | | ✔ | 9,90 |
| 11 5001 045 | • 3 | 14 | 3 | 75 | | ✔ | 10,90 |
| 11 5001 050 | • 3 | 14 | 3 | 100 | | ✔ | 13,60 |
| 11 5001 052 | • 3 | 12,7 | 6 | 50 | | ✔ | 10,10 |
| 11 5001 055 | • 4 | 14 | 6 | 50 | | ✔ | 10,10 |
| 11 5001 057 | • 5 | 12,7 | 3 | 38 | | ✔ | 15,70 |
| 11 5001 058 | • 5 | 16 | 6 | 50 | | ✔ | 10,10 |
| 11 5001 059 | • 6 | 5 | 3 | 37 | ✔ | | 9,65 |
| 11 5001 060 | • 6 | 13 | 3 | 45 | ✔ | | 12,20 |
| 11 5001 065 | • 6 | 18 | 6 | 50 | | ✔ | 10,10 |
| | | | | | | | |
| 11 5001 067 | • 6 | 25 | 6 | 50 | | ✔ | 13,70 |
| 11 5001 070 | • 6 | 18 | 6 | 100 | ✔ | | 17,85 |
| 11 5001 075 | • 6 | 18 | 6 | 150 | ✔ | | 25,40 |
| 11 5001 080 | • 8 | 20 | 6 | 65 | ✔ | | 12,60 |
| | | | | | | | |
| 11 5001 085 | • 8 | 20 | 6 | 170 | ✔ | | 18,30 |
| 11 5001 087 | • 10 | 13 | 6 | 58 | ✔ | | 15,50 |
| 11 5001 090 | • 10 | 20 | 6 | 65 | ✔ | | 14,50 |
| | | | | | | | |
| 11 5001 095 | • 10 | 20 | 6 | 172 | ✔ | | 21,95 |
| 11 5001 100 | • 10 | 25 | 6 | 70 | ✔ | | 16,70 |
| 11 5001 103 | • 12 | 20 | 6 | 64 | ✔ | | 23,75 |
| 11 5001 105 | • 12 | 25 | 6 | 70 | ✔ | | 22,25 |
| 11 5001 107 | • 12DIN | 25 | 6 | 70 | ✔ | | 20,50 |
| | | | | | | | |
| 11 5001 110 | • 12 | 25 | 6 | 175 | ✔ | | 32,25 |
| 11 5001 115 | • 12 | 25 | 8 | 70 | ✔ | | 24,20 |
| 11 5001 120 | • 16 | 25 | 6 | 70 | ✔ | | 26,95 |
| | | | | | | | |
| 11 5001 125 | • 16 | 25 | 8 | 70 | ✔ | | 28,95 |
| 11 5001 130 | • 20 | 25 | 6 | 70 | ✔ | | 40,90 |
| 11 5001 140 | • 25 | 25 | 6 | 70 | ✔ | | 52,80 |
| 11 5001 145 | • 25 | 25 | 8 | 70 | ✔ | | 54,75 |

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | € | |
|---|---|---|---|---|---|---|---|---|
| 11 3001 015 | • 1,5 | 6 | 3 | 38 | | ✔ | 5,80 | |
| 11 3001 025 | • 2 | 11 | 3 | 38 | | ✔ | 5,80 | |
| 11 3001 027 | % 2,5 | 11 | 3 | 38 | | ✔ | 3,60 | |
| 11 3001 030 | • 3 | 14 | 3 | 38 | | ✔ | 5,80 | |
| 11 3001 031 | • 3 | 14 | 3 | 38 | | ✔ | 3,95 | NEW |
| 11 3001 035 | • 3 | 14 | 3 | 50 | | ✔ | 7,20 | |
| 11 3001 040 | • 3 | 14 | 3 | 65 | | ✔ | 8,10 | |
| 11 3001 045 | • 3 | 14 | 3 | 75 | | ✔ | 9,15 | |
| 11 3001 050 | • 3 | 14 | 3 | 100 | | ✔ | 11,80 | |
| 11 3001 052 | • 3 | 12,7 | 6 | 50 | | ✔ | 8,30 | |
| 11 3001 055 | • 4 | 14 | 6 | 50 | | ✔ | 8,30 | |
| 11 3001 057 | • 5 | 12,7 | 3 | 38 | | ✔ | 13,95 | |
| 11 3001 058 | • 5 | 16 | 6 | 50 | | ✔ | 8,30 | |
| 11 3001 059 | • 6 | 5 | 3 | 37 | ✔ | | 7,85 | |
| 11 3001 060 | • 6 | 13 | 3 | 45 | ✔ | | 10,45 | |
| 11 3001 065 | • 6 | 18 | 6 | 50 | | ✔ | 8,30 | |
| 11 3001 066 | • 6 | 18 | 6 | 50 | | ✔ | 6,20 | NEW |
| 11 3001 067 | • 6 | 25 | 6 | 50 | | ✔ | 11,95 | |
| 11 3001 070 | • 6 | 18 | 6 | 100 | ✔ | | 16,05 | |
| 11 3001 075 | • 6 | 18 | 6 | 150 | ✔ | | 22,60 | |
| 11 3001 080 | • 8 | 20 | 6 | 65 | ✔ | | 10,80 | |
| 11 3001 081 | • 8 | 20 | 6 | 65 | ✔ | | 8,10 | NEW |
| 11 3001 085 | • 8 | 20 | 6 | 170 | ✔ | | 15,50 | |
| 11 3001 087 | • 10 | 13 | 6 | 58 | ✔ | | 12,65 | |
| 11 3001 090 | • 10 | 20 | 6 | 65 | ✔ | | 11,60 | |
| 11 3001 091 | • 10 | 20 | 6 | 65 | ✔ | | 8,70 | NEW |
| 11 3001 095 | • 10 | 20 | 6 | 172 | ✔ | | 16,20 | |
| 11 3001 100 | • 10 | 25 | 6 | 70 | ✔ | | 13,80 | |
| 11 3001 103 | • 12 | 20 | 6 | 64 | ✔ | | 19,55 | |
| 11 3001 105 | • 12 | 25 | 6 | 70 | ✔ | | 18,05 | |
| 11 3001 107 | • 12DIN | 25 | 6 | 70 | ✔ | | 16,30 | |
| 11 3001 108 | • 12DIN | 25 | 6 | 70 | ✔ | | 12,40 | NEW |
| 11 3001 110 | • 12 | 25 | 6 | 175 | ✔ | | 25,25 | |
| 11 3001 115 | • 12 | 25 | 8 | 70 | ✔ | | 19,95 | |
| 11 3001 120 | • 16 | 25 | 6 | 70 | ✔ | | 22,75 | |
| 11 3001 121 | • 16 | 25 | 6 | 70 | ✔ | | 17,10 | NEW |
| 11 3001 125 | • 16 | 25 | 8 | 70 | ✔ | | 24,75 | |
| 11 3001 130 | • 20 | 25 | 6 | 70 | ✔ | | 33,85 | |
| 11 3001 140 | • 25 | 25 | 6 | 70 | ✔ | | 47,35 | |
| 11 3001 145 | % 25 | 25 | 8 | 70 | ✔ | | 30,60 | |

Der revolutionäre Zylinder-Radius Frässtift siehe Seite 756/757
The revolutionary cylinder-radius burr see page 756/757






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**11 5011**

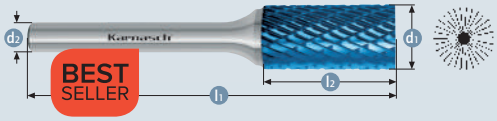
**11 3011**

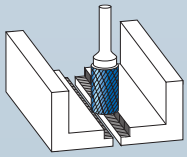
BLUETEC BESCHICHTET COATED

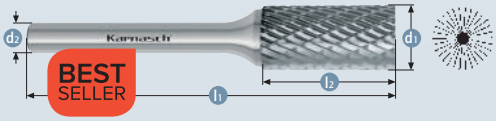
**B** FORM / SHAPE **ZYB**

Zylinder mit Stirnverzahnung

Cylinder with end cut






NEW VALUETOOL

Schnittdaten Cutting data

Film Movie

753

Bestseller – preisreduziert · Bestseller – price reduced

Valuetool – hervorragendes Preis-Leistungs-Verhältnis
Valuetool – excellent price-performance ratio

Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | € |
|---|---|---|---|---|---|---|---|
| 11 5011 005 | • 1,5 | 6 | 3 | 38 | | ✔ | 7,55 |
| 11 5011 010 | • 2 | 11 | 3 | 38 | | ✔ | 8,20 |
| 11 5011 012 | • 2,5 | 11 | 3 | 38 | | ✔ | 7,55 |
| 11 5011 015 | • 3 | 14 | 3 | 38 | | ✔ | 7,45 |
| 11 5011 020 | • 3 | 14 | 3 | 50 | | ✔ | 9,60 |
| 11 5011 025 | • 3 | 14 | 3 | 65 | | ✔ | 10,70 |
| 11 5011 030 | • 3 | 14 | 3 | 75 | | ✔ | 11,80 |
| 11 5011 035 | • 3 | 14 | 3 | 100 | | ✔ | 14,80 |
| 11 5011 037 | • 3 | 12,7 | 6 | 50 | | ✔ | 10,70 |
| 11 5011 040 | • 4 | 14 | 6 | 50 | | ✔ | 10,70 |
| 11 5011 042 | • 5 | 16 | 6 | 50 | | ✔ | 10,70 |
| 11 5011 043 | • 6 | 5 | 3 | 37 | ✔ | | 11,30 |
| 11 5011 045 | • 6 | 13 | 3 | 45 | ✔ | | 13,25 |
| 11 5011 050 | • 6 | 18 | 6 | 50 | | ✔ | 10,70 |
| 11 5011 055 | • 6 | 18 | 6 | 75 | | ✔ | 13,45 |
| 11 5011 060 | • 6 | 18 | 6 | 100 | ✔ | | 19,45 |
| 11 5011 065 | • 6 | 18 | 6 | 150 | ✔ | | 27,65 |
| 11 5011 070 | • 6 | 25 | 6 | 50 | | ✔ | 14,90 |
| 11 5011 075 | • 8 | 20 | 6 | 65 | ✔ | | 13,60 |
| 11 5011 080 | • 8 | 20 | 6 | 170 | ✔ | | 19,85 |
| 11 5011 082 | • 10 | 13 | 6 | 58 | ✔ | | 16,80 |
| 11 5011 085 | • 10 | 20 | 6 | 65 | ✔ | | 15,60 |
| 11 5011 090 | • 10 | 20 | 6 | 172 | ✔ | | 24,05 |
| 11 5011 095 | • 10 | 25 | 6 | 70 | ✔ | | 17,95 |
| 11 5011 097 | % 11 | 25 | 6 | 70 | ✔ | | 13,25 |
| 11 5011 099 | • 12 | 20 | 6 | 64 | ✔ | | 25,75 |
| 11 5011 100 | • 12 | 25 | 6 | 70 | ✔ | | 24,05 |
| 11 5011 103 | • 12DIN | 25 | 6 | 70 | ✔ | | 22,10 |
| 11 5011 105 | • 12 | 25 | 6 | 175 | ✔ | | 35,65 |
| 11 5011 110 | • 12 | 25 | 8 | 70 | ✔ | | 26,15 |
| 11 5011 115 | • 16 | 25 | 6 | 70 | ✔ | | 29,20 |
| 11 5011 120 | • 16 | 25 | 8 | 70 | ✔ | | 31,15 |
| 11 5011 125 | • 20 | 25 | 6 | 70 | ✔ | | 42,70 |
| 11 5011 130 | • 20 | 25 | 8 | 70 | ✔ | | 44,90 |
| 11 5011 135 | • 25 | 25 | 6 | 70 | ✔ | | 57,55 |
| 11 5011 140 | • 25 | 25 | 8 | 70 | ✔ | | 59,50 |

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | € | |
|---|---|---|---|---|---|---|---|---|
| 11 3011 005 | • 1,5 | 6 | 3 | 38 | | ✔ | 5,80 | |
| 11 3011 010 | • 2 | 11 | 3 | 38 | | ✔ | 6,45 | |
| 11 3011 012 | • 2,5 | 11 | 3 | 38 | | ✔ | 5,80 | |
| 11 3011 015 | • 3 | 14 | 3 | 38 | | ✔ | 5,70 | |
| 11 3011 016 | • 3 | 14 | 3 | 38 | | ✔ | 4,35 | NEW |
| 11 3011 020 | • 3 | 14 | 3 | 50 | | ✔ | 7,85 | |
| 11 3011 025 | • 3 | 14 | 3 | 65 | | ✔ | 8,90 | |
| 11 3011 030 | • 3 | 14 | 3 | 75 | | ✔ | 10,00 | |
| 11 3011 035 | • 3 | 14 | 3 | 100 | | ✔ | 13,00 | |
| 11 3011 037 | • 3 | 12,7 | 6 | 50 | | ✔ | 8,95 | |
| 11 3011 040 | • 4 | 14 | 6 | 50 | | ✔ | 8,95 | |
| 11 3011 042 | • 5 | 16 | 6 | 50 | | ✔ | 8,95 | |
| 11 3011 043 | • 6 | 5 | 3 | 37 | ✔ | | 9,50 | |
| 11 3011 045 | • 6 | 13 | 3 | 45 | ✔ | | 11,50 | |
| 11 3011 050 | • 6 | 18 | 6 | 50 | | ✔ | 8,95 | |
| 11 3011 051 | • 6 | 18 | 6 | 50 | | ✔ | 6,80 | NEW |
| 11 3011 055 | • 6 | 18 | 6 | 75 | | ✔ | 11,65 | |
| 11 3011 060 | • 6 | 18 | 6 | 100 | ✔ | | 17,65 | |
| 11 3011 065 | • 6 | 18 | 6 | 150 | ✔ | | 24,85 | |
| 11 3011 070 | • 6 | 25 | 6 | 50 | | ✔ | 13,10 | |
| 11 3011 075 | • 8 | 20 | 6 | 65 | ✔ | | 11,85 | |
| 11 3011 076 | • 8 | 20 | 6 | 65 | ✔ | | 8,90 | NEW |
| 11 3011 080 | • 8 | 20 | 6 | 170 | ✔ | | 17,00 | |
| 11 3011 082 | % 10 | 13 | 6 | 58 | ✔ | | 8,65 | |
| 11 3011 085 | • 10 | 20 | 6 | 65 | ✔ | | 12,75 | |
| 11 3011 086 | • 10 | 20 | 6 | 65 | ✔ | | 9,60 | NEW |
| 11 3011 090 | • 10 | 20 | 6 | 172 | ✔ | | 18,25 | |
| 11 3011 095 | • 10 | 25 | 6 | 70 | ✔ | | 15,10 | |
| 11 3011 097 | • 11 | 25 | 6 | 70 | ✔ | | 18,50 | |
| 11 3011 099 | • 12 | 20 | 6 | 64 | ✔ | | 21,55 | |
| 11 3011 100 | • 12 | 25 | 6 | 70 | ✔ | | 19,85 | |
| 11 3011 103 | • 12DIN | 25 | 6 | 70 | ✔ | | 17,90 | |
| 11 3011 104 | • 12DIN | 25 | 6 | 70 | ✔ | | 13,65 | NEW |
| 11 3011 105 | • 12 | 25 | 6 | 175 | ✔ | | 28,60 | |
| 11 3011 110 | • 12 | 25 | 8 | 70 | ✔ | | 21,95 | |
| 11 3011 115 | • 16 | 25 | 6 | 70 | ✔ | | 25,00 | |
| 11 3011 116 | • 16 | 25 | 6 | 70 | ✔ | | 18,80 | NEW |
| 11 3011 120 | • 16 | 25 | 8 | 70 | ✔ | | 26,95 | |
| 11 3011 125 | • 20 | 25 | 6 | 70 | ✔ | | 37,25 | |
| 11 3011 130 | • 20 | 25 | 8 | 70 | ✔ | | 39,45 | |
| 11 3011 135 | • 25 | 25 | 6 | 70 | ✔ | | 52,10 | |
| 11 3011 140 | • 25 | 25 | 8 | 70 | ✔ | | 54,05 | |

Der revolutionäre Zylinder-Radius Frässtift siehe Seite 756/757
The revolutionary cylinder-radius burr see page 756/757



% Sonderpreis / Sale Artikel. Lieferbar solange Vorrat.

# CYLINDER+RADIUS




## Das einzigartige **CYLINDER+RADIUS** Design verwandelt den herkömmlichen Zylinder Frässtift in ein Hightech Werkzeug.

Diese neue Entwicklung erfüllt die höchsten Herstellungsstandards für alle Arten der Anwendung in der Industrie, darunter speziell auch für die Luft- und Raumfahrtindustrie.

Das spezielle Radius-Design an der Spitze des Zylinders vermeidet Zahnbruch und erhöht wesentlich die Standzeit.

**Durch Radiusdesign:**
- kein Verkanten / Abrutschen in das Werkstück.
- Beschädigungen von teuren Werkzeugen werden vermieden.

**Durch Kreuzverzahnung:**
- exzellente Kontrolle und Führung beim Entgratvorgang.

**Eigenschaften und Vorteile:**
Der Radius an der Spitze des Fräsers ergibt:
- verbesserte Nutenstabilität durch verrundete Kanten.
- Der Radius ermöglicht eine bessere Kontrolle während des Schleifvorgangs.
- Die Rundung verhindert das Verkanten / Abrutschen in das Werkstück.
- Erzeugung eines Radius' auf dem Werkstück
- Rundung reduziert Bruch an der Schnittkante des Fräsers.

## The **CYLINDER+RADIUS** unique design transforms the conventional cylinder burr into a hightech tool.

The new development meets the highest manufacturing standards for all kind of industries, especially the aerospace industry.

**The radius design** at the top of the cylinder provides an extended tool life avoiding teeth breakage.

This unique design with its **double cut** will improve operator control, reduce the size of chips and prevent damage to expensive parts.

**Features and benefits:**
Radius at the top of the cylinder results:
- Offers improved flute strength at the start of the bur.
- The radius provides better control of the burr.
- Prevents digging into work piece at the intersecting point.
- Produces a cylinder radius on the work piece.
- Reduces flute chipping at the intersecting point.



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Karnasch®

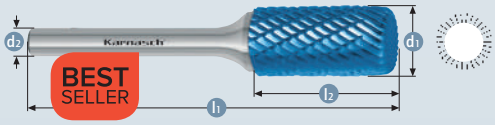
**11 6010**

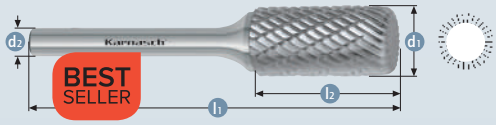
BLUETEC BESCHICHTET COATED

HP-3

**11 4010**

| A FORM / SHAPE | ZYA |
|---|---|
| Zylinder-Radius | |
| Cylinder-Radius | |




Schnittdaten / Cutting data

Film / Movie

753

Bestseller – preisreduziert · Bestseller – price reduced

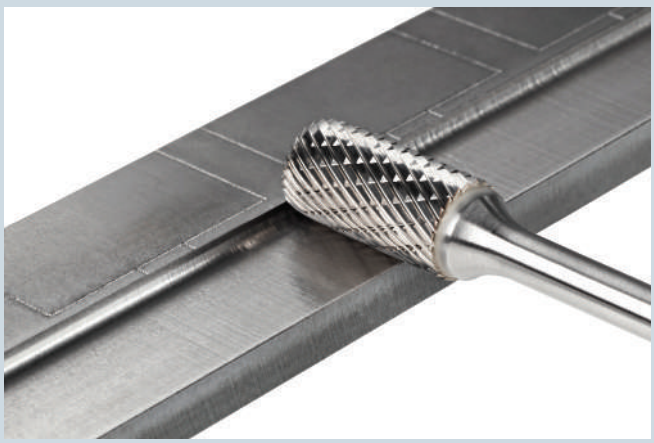
| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | € |
|---|---|---|---|---|---|---|---|
| 11 6010 005 | • 3 | 14 | 3 | 38 | | ✔ | 8,45 |
| 11 6010 010 | • 6 | 18 | 6 | 50 | | ✔ | 11,30 |
| 11 6010 015 | • 8 | 19 | 6 | 64 | ✔ | | 14,15 |
| 11 6010 020 | • 10 | 19 | 6 | 64 | ✔ | | 16,25 |
| 11 6010 025 | • 12 | 25 | 6 | 70 | ✔ | | 24,95 |
| 11 6010 030 | • 16 | 25 | 6 | 70 | ✔ | | 30,35 |

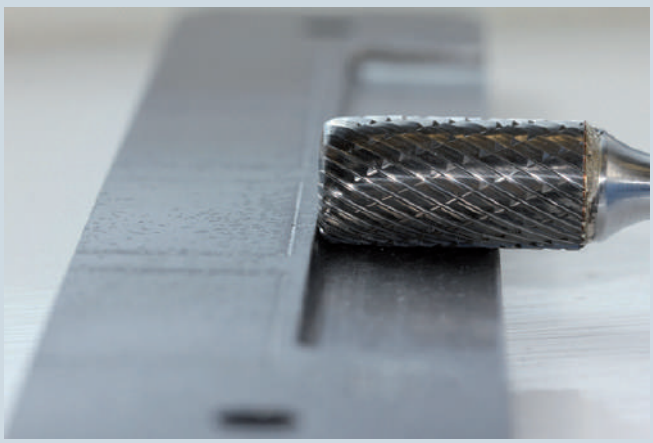
Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | € |
|---|---|---|---|---|---|---|---|
| 11 4010 005 | • 3 | 14 | 3 | 38 | | ✔ | 6,65 |
| 11 4010 010 | • 6 | 18 | 6 | 50 | | ✔ | 9,55 |
| 11 4010 015 | • 8 | 19 | 6 | 64 | ✔ | | 12,40 |
| 11 4010 020 | • 10 | 19 | 6 | 64 | ✔ | | 13,35 |
| 11 4010 025 | • 12 | 25 | 6 | 70 | ✔ | | 20,75 |
| 11 4010 030 | • 16 | 25 | 6 | 70 | ✔ | | 26,15 |

5

## Anwendungsbeispiele / Application examples







## 11 5021

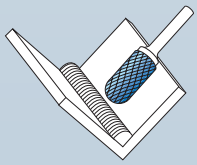
BLUETEC BESCHICHTET COATED



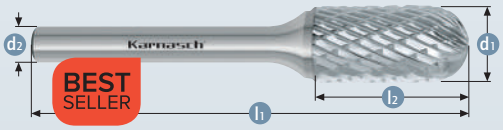

**C** FORM / SHAPE **WRC**

Walzenrundform

Ball nosed cylinder



## 11 3021




NEW VALUETOOL

Schnittdaten Cutting data 753

Film Movie

Bestseller – preisreduziert · Bestseller – price reduced

Valuetool – hervorragendes Preis-Leistungs-Verhältnis
Valuetool – excellent price-performance ratio

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | € |
|---|---|---|---|---|---|---|---|
| 11 5021 020 | ● 2 | 11 | 3 | 38 | | ✔ | 7,60 |
| 11 5021 022 | ● 2,5 | 11 | 3 | 38 | | ✔ | 7,45 |
| 11 5021 025 | ● 3 | 14 | 3 | 38 | | ✔ | 7,60 |
| | | | | | | | |
| 11 5021 030 | ●● 3 | 14 | 3 | 50 | | ✔ | 9,90 |
| 11 5021 032 | ●● 3 | 14 | 3 | 60 | | ✔ | 10,40 |
| 11 5021 035 | ●● 3 | 14 | 3 | 75 | | ✔ | 10,90 |
| 11 5021 040 | ●● 3 | 14 | 3 | 100 | | ✔ | 13,70 |
| 11 5021 042 | ● 3 | 12,7 | 6 | 50 | | ✔ | 11,75 |
| 11 5021 043 | ●● 3 | 30*(15) | 6 | 60 | | ✔ | 21,70 |
| 11 5021 045 | ● 4 | 16 | 6 | 50 | | ✔ | 11,35 |
| 11 5021 046 | ●● 4 | 30*(15) | 6 | 60 | | ✔ | 22,25 |
| 11 5021 047 | ● 5 | 12,7 | 3 | 38 | | ✔ | 15,70 |
| 11 5021 049 | ● 5 | 16 | 6 | 50 | | ✔ | 11,35 |
| 11 5021 050 | ● 6 | 12,7 | 3 | 44 | ✔ | | 11,30 |
| | | | | | | | |
| 11 5021 055 | ●● 6 | 18 | 6 | 50 | | ✔ | 11,35 |
| 11 5021 056 | ●● 6 | 18 | 6 | 60 | | ✔ | 15,20 |
| 11 5021 058 | ●● 6 | 18 | 6 | 80 | | ✔ | 18,05 |
| 11 5021 060 | ●● 6 | 18 | 6 | 100 | ✔ | | 20,40 |
| 11 5021 065 | ●● 6 | 18 | 6 | 150 | ✔ | | 29,00 |
| 11 5021 070 | ● 6 | 25 | 6 | 50 | | ✔ | 14,90 |
| 11 5021 075 | ● 8 | 20 | 6 | 65 | ✔ | | 13,50 |
| | | | | | | | |
| 11 5021 080 | ● 8 | 20 | 6 | 170 | ✔ | | 19,70 |
| 11 5021 085 | ● 10 | 20 | 6 | 65 | ✔ | | 15,75 |
| | | | | | | | |
| 11 5021 090 | ● 10 | 20 | 6 | 170 | ✔ | | 23,80 |
| 11 5021 095 | ● 10 | 25 | 6 | 70 | ✔ | | 18,00 |
| 11 5021 097 | ● 11 | 25 | 6 | 70 | ✔ | | 22,65 |
| 11 5021 099 | ● 12 | 10 | 6 | 54 | ✔ | | 26,20 |
| 11 5021 100 | ● 12 | 20 | 6 | 65 | ✔ | | 25,80 |
| 11 5021 105 | ● 12 | 25 | 6 | 70 | ✔ | | 24,45 |
| 11 5021 107 | ● 12DIN | 25 | 6 | 70 | ✔ | | 22,50 |
| | | | | | | | |
| 11 5021 110 | ● 12 | 25 | 6 | 175 | ✔ | | 35,35 |
| 11 5021 115 | ● 12 | 25 | 8 | 70 | ✔ | | 26,60 |
| 11 5021 120 | ● 16 | 25 | 6 | 70 | ✔ | | 29,75 |
| | | | | | | | |
| 11 5021 125 | ● 16 | 25 | 8 | 70 | ✔ | | 32,60 |
| 11 5021 130 | ● 20 | 25 | 6 | 70 | ✔ | | 42,10 |
| 11 5021 135 | ● 20 | 25 | 8 | 70 | ✔ | | 44,00 |

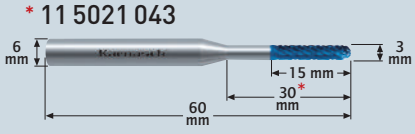
| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | € |
|---|---|---|---|---|---|---|---|
| 11 3021 020 | ● 2 | 11 | 3 | 38 | | ✔ | 5,80 |
| 11 3021 022 | ● 2,5 | 11 | 3 | 38 | | ✔ | 5,70 |
| 11 3021 025 | ● 3 | 14 | 3 | 38 | | ✔ | 5,80 |
| 11 3021 026 | ● 3 | 14 | 3 | 38 | | ✔ | 3,95 NEW |
| 11 3021 030 | ●● 3 | 14 | 3 | 50 | | ✔ | 8,10 |
| 11 3021 032 | ●● 3 | 14 | 3 | 60 | | ✔ | 8,60 |
| 11 3021 035 | ●● 3 | 14 | 3 | 75 | | ✔ | 9,15 |
| 11 3021 040 | ●● 3 | 14 | 3 | 100 | | ✔ | 11,90 |
| 11 3021 042 | ● 3 | 12,7 | 6 | 50 | | ✔ | 9,95 |
| 11 3021 043 | ●● 3 | 30*(15) | 6 | 60 | | ✔ | 19,95 |
| 11 3021 045 | ● 4 | 16 | 6 | 50 | | ✔ | 9,60 |
| 11 3021 046 | ●● 4 | 30*(15) | 6 | 60 | | ✔ | 20,50 |
| 11 3021 047 | ● 5 | 12,7 | 3 | 38 | | ✔ | 13,95 |
| 11 3021 049 | ● 5 | 16 | 6 | 50 | | ✔ | 9,60 |
| 11 3021 050 | ● 6 | 12,7 | 3 | 44 | ✔ | | 9,50 |
| 11 3021 054 | ●● 6 | 18 | 6 | 50 | | ✔ | 7,20 NEW |
| 11 3021 055 | ●● 6 | 18 | 6 | 50 | | ✔ | 9,60 |
| 11 3021 056 | ●● 6 | 18 | 6 | 60 | | ✔ | 13,40 |
| 11 3021 058 | ●● 6 | 18 | 6 | 80 | | ✔ | 16,30 |
| 11 3021 060 | ●● 6 | 18 | 6 | 100 | ✔ | | 18,65 |
| 11 3021 065 | ●● 6 | 18 | 6 | 150 | ✔ | | 26,20 |
| 11 3021 070 | ● 6 | 25 | 6 | 50 | | ✔ | 13,10 |
| 11 3021 075 | ● 8 | 20 | 6 | 65 | ✔ | | 11,75 |
| 11 3021 076 | ● 8 | 20 | 6 | 65 | ✔ | | 8,85 NEW |
| 11 3021 080 | ● 8 | 20 | 6 | 170 | ✔ | | 16,90 |
| 11 3021 085 | ● 10 | 20 | 6 | 65 | ✔ | | 12,90 |
| 11 3021 086 | ● 10 | 20 | 6 | 65 | ✔ | | 9,70 NEW |
| 11 3021 090 | ● 10 | 20 | 6 | 170 | ✔ | | 18,00 |
| 11 3021 095 | ● 10 | 25 | 6 | 70 | ✔ | | 15,10 |
| 11 3021 097 | ● 11 | 25 | 6 | 70 | ✔ | | 18,45 |
| | | | | | | | |
| 11 3021 100 | ● 12 | 20 | 6 | 65 | ✔ | | 21,60 |
| 11 3021 105 | ● 12 | 25 | 6 | 70 | ✔ | | 20,25 |
| 11 3021 107 | ● 12DIN | 25 | 6 | 70 | ✔ | | 18,30 |
| 11 3021 108 | ● 12DIN | 25 | 6 | 70 | ✔ | | 13,90 NEW |
| 11 3021 110 | ● 12 | 25 | 6 | 175 | ✔ | | 28,35 |
| 11 3021 115 | ● 12 | 25 | 8 | 70 | ✔ | | 22,40 |
| 11 3021 120 | ● 16 | 25 | 6 | 70 | ✔ | | 25,55 |
| 11 3021 121 | ● 16 | 25 | 6 | 70 | ✔ | | 19,10 NEW |
| 11 3021 125 | ● 16 | 25 | 8 | 70 | ✔ | | 28,35 |
| 11 3021 130 | ● 20 | 25 | 6 | 70 | ✔ | | 36,60 |
| 11 3021 135 | ● 20 | 25 | 8 | 70 | ✔ | | 38,55 |

● Frässtifte speziell für Schlüsseldienste siehe Seite 838/839

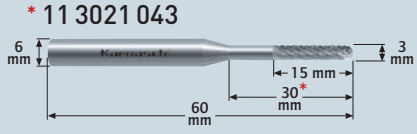
Burrs specially for locksmiths see page 838/839

* Von 30 mm sind 15 mm verzahnt
15 mm by 30 mm are not machined

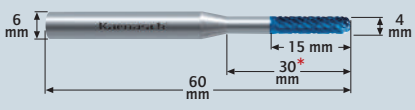
* 11 5021 043



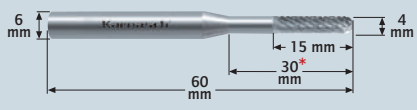

* 11 3021 043




* 11 5021 046




* 11 3021 046








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# 11 5031

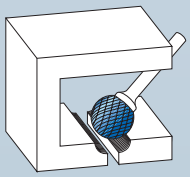
BLUETEC BESCHICHTET COATED




**D** FORM / SHAPE **KUD**

Kugel

Ball



# 11 3031




NEW VALUETOOL

Schnittdaten Cutting data

Film Movie

753

Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | € |
|---|---|---|---|---|---|---|---|
| 11 5031 020 | • 2 | 1,8 | 3 | 38 | | ✔ | 7,60 |
| 11 5031 022 | • 2,5 | 2,3 | 3 | 38 | | ✔ | 7,60 |
| 11 5031 025 | • 3 | 2,5 | 3 | 38 | | ✔ | 7,60 |
| | | | | | | | |
| 11 5031 030 | • 3 | 2,5 | 3 | 50 | | ✔ | 9,30 |
| 11 5031 035 | • 3 | 2,5 | 3 | 75 | | ✔ | 10,30 |
| 11 5031 040 | • 3 | 2,5 | 6 | 50 | | ✔ | 10,55 |
| 11 5031 045 | • 4 | 3,4 | 3 | 38 | | ✔ | 15,70 |
| 11 5031 046 | • 4 | 3,4 | 6 | 50 | | ✔ | 10,95 |
| 11 5031 047 | • 5 | 4,7 | 3 | 38 | | ✔ | 15,70 |
| 11 5031 048 | • 5 | 5,0 | 6 | 50 | | ✔ | 10,55 |
| 11 5031 050 | • 6 | 5,0 | 3 | 38 | ✔ | | 10,95 |
| 11 5031 055 | • 6 | 4,7 | 6 | 50 | | ✔ | 10,55 |
| | | | | | | | |
| 11 5031 060 | • 8 | 6,0 | 6 | 52 | ✔ | | 11,25 |
| | | | | | | | |
| 11 5031 065 | • 8 | 6,0 | 6 | 180 | ✔ | | 16,35 |
| 11 5031 070 | • 10 | 8,0 | 6 | 54 | ✔ | | 13,45 |
| | | | | | | | |
| 11 5031 075 | • 10 | 8,0 | 6 | 185 | ✔ | | 20,65 |
| 11 5031 077 | • 11 | 9,5 | 6 | 55 | ✔ | | 16,45 |
| 11 5031 080 | • 12 | 11,4 | 6 | 56 | ✔ | | 18,40 |
| 11 5031 083 | • 12DIN | 11,0 | 6 | 56 | ✔ | | 17,05 |
| | | | | | | | |
| 11 5031 085 | • 12 | 11,0 | 8 | 56 | ✔ | | 19,30 |
| 11 5031 090 | • 12 | 11,0 | 6 | 162 | ✔ | | 27,00 |
| 11 5031 095 | • 16 | 14,0 | 6 | 60 | ✔ | | 21,90 |
| | | | | | | | |
| 11 5031 100 | • 16 | 14,0 | 8 | 60 | ✔ | | 23,90 |
| 11 5031 105 | • 20 | 16,5 | 6 | 62 | ✔ | | 29,85 |
| 11 5031 110 | • 20 | 16,5 | 8 | 62 | ✔ | | 31,90 |
| 11 5031 115 | • 25 | 22,0 | 6 | 68 | ✔ | | 47,40 |
| 11 5031 120 | • 25 | 22,0 | 8 | 68 | ✔ | | 49,30 |

Bestseller – preisreduziert · Bestseller – price reduced

Valuetool – hervorragendes Preis-Leistungs-Verhältnis
Valuetool – excellent price-performance ratio

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | € | |
|---|---|---|---|---|---|---|---|---|
| 11 3031 020 | • 2 | 1,8 | 3 | 38 | | ✔ | 5,80 | |
| 11 3031 022 | • 2,5 | 2,3 | 3 | 38 | | ✔ | 5,80 | |
| 11 3031 025 | • 3 | 2,5 | 3 | 38 | | ✔ | 5,80 | |
| 11 3031 026 | • 3 | 2,5 | 3 | 38 | | ✔ | 3,95 | NEW |
| 11 3031 030 | • 3 | 2,5 | 3 | 50 | | ✔ | 7,50 | |
| 11 3031 035 | • 3 | 2,5 | 3 | 75 | | ✔ | 8,55 | |
| 11 3031 040 | • 3 | 2,5 | 6 | 50 | | ✔ | 8,75 | |
| 11 3031 045 | • 4 | 3,4 | 3 | 38 | | ✔ | 13,95 | |
| 11 3031 046 | • 4 | 3,4 | 6 | 50 | | ✔ | 9,15 | |
| 11 3031 047 | • 5 | 4,7 | 3 | 38 | | ✔ | 13,95 | |
| 11 3031 048 | • 5 | 5,0 | 6 | 50 | | ✔ | 8,75 | |
| 11 3031 050 | • 6 | 5,0 | 3 | 38 | ✔ | | 9,15 | |
| 11 3031 055 | • 6 | 4,7 | 6 | 50 | | ✔ | 8,75 | |
| 11 3031 056 | • 6 | 4,7 | 6 | 50 | | ✔ | 6,65 | NEW |
| 11 3031 060 | • 8 | 6,0 | 6 | 52 | ✔ | | 9,45 | |
| 11 3031 061 | • 8 | 7,0 | 6 | 52 | ✔ | | 7,10 | NEW |
| 11 3031 065 | • 8 | 6,0 | 6 | 180 | ✔ | | 13,55 | |
| 11 3031 070 | • 10 | 8,0 | 6 | 54 | ✔ | | 10,60 | |
| 11 3031 071 | • 10 | 9,0 | 6 | 54 | ✔ | | 7,95 | NEW |
| 11 3031 075 | • 10 | 8,0 | 6 | 185 | ✔ | | 14,85 | |
| 11 3031 077 | • 11 | 9,5 | 6 | 55 | ✔ | | 12,25 | |
| 11 3031 080 | • 12 | 11,4 | 6 | 56 | ✔ | | 14,20 | |
| 11 3031 083 | • 12DIN | 11,0 | 6 | 56 | ✔ | | 12,85 | |
| 11 3031 084 | • 12DIN | 11,0 | 6 | 56 | ✔ | | 9,80 | NEW |
| 11 3031 085 | • 12 | 11,0 | 8 | 56 | ✔ | | 15,10 | |
| 11 3031 090 | • 12 | 11,0 | 6 | 162 | ✔ | | 19,95 | |
| 11 3031 095 | • 16 | 14,0 | 6 | 60 | ✔ | | 17,65 | |
| 11 3031 096 | • 16 | 14,0 | 6 | 60 | ✔ | | 13,30 | NEW |
| 11 3031 100 | • 16 | 14,0 | 8 | 60 | ✔ | | 19,70 | |
| 11 3031 105 | • 20 | 16,5 | 6 | 62 | ✔ | | 24,35 | |
| 11 3031 110 | • 20 | 16,5 | 8 | 62 | ✔ | | 26,40 | |
| 11 3031 115 | • 25 | 22,0 | 6 | 68 | ✔ | | 41,90 | |
| 11 3031 120 | • 25 | 22,0 | 8 | 68 | ✔ | | 43,85 | |







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## 11 5041

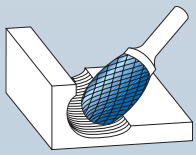
BLUETEC BESCHICHTET COATED




**E** FORM / SHAPE **TRE**

Tropfen

Oval



## 11 3041




NEW VALUETOOL

Schnittdaten Cutting data | Film Movie

753



Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | € |
|---|---|---|---|---|---|---|---|
| 11 5041 010 | • 3 | 6 | 3 | 38 | | ✔ | 7,60 |
| 11 5041 011 | • 3 | 6 | 3 | 75 | | ✔ | 11,10 |
| 11 5041 012 | • 5 | 7,1 | 3 | 38 | | ✔ | 15,70 |
| 11 5041 015 | • 6 | 10 | 3 | 42 | ✔ | | 11,30 |
| 11 5041 020 | • 6 | 10 | 6 | 50 | | ✔ | 12,60 |
| 11 5041 025 | • 8 | 15 | 6 | 60 | ✔ | | 14,80 |
| 11 5041 030 | • 10 | 16 | 6 | 60 | ✔ | | 15,75 |
| 11 5041 032 | • 10 | 16 | 6 | 170 | ✔ | | 29,30 |
| 11 5041 035 | • 12 | 22 | 6 | 67 | ✔ | | 23,05 |
| 11 5041 037 | • 12DIN | 21 | 6 | 66 | ✔ | | 21,25 |
| 11 5041 038 | % 12 | 22 | 6 | 175 | ✔ | | 22,45 |
| 11 5041 040 | • 12 | 22 | 8 | 67 | ✔ | | 25,05 |
| 11 5041 045 | • 16 | 25 | 6 | 70 | ✔ | | 30,35 |
| 11 5041 050 | • 16 | 25 | 8 | 70 | ✔ | | 33,30 |
| 11 5041 055 | • 20 | 25 | 6 | 70 | ✔ | | 40,70 |
| 11 5041 060 | • 20 | 25 | 8 | 70 | ✔ | | 42,65 |

Bestseller – preisreduziert · Bestseller – price reduced

Valuetool – hervorragendes Preis-Leistungs-Verhältnis
Valuetool – excellent price-performance ratio

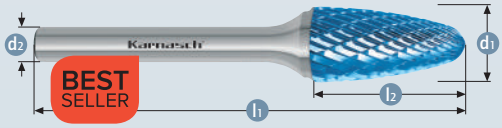
| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | € | |
|---|---|---|---|---|---|---|---|---|
| 11 3041 005 | • 3 | 6 | 3 | 50 | | ✔ | 7,60 | |
| 11 3041 009 | • 3 | 6 | 3 | 38 | | ✔ | 3,95 | NEW |
| 11 3041 010 | • 3 | 6 | 3 | 38 | | ✔ | 5,80 | |
| 11 3041 011 | • 3 | 6 | 3 | 75 | | ✔ | 9,35 | |
| 11 3041 012 | • 5 | 7,1 | 3 | 38 | | ✔ | 13,95 | |
| 11 3041 015 | • 6 | 10 | 3 | 42 | ✔ | | 9,50 | |
| 11 3041 020 | • 6 | 10 | 6 | 50 | | ✔ | 10,80 | |
| 11 3041 021 | • 6 | 10 | 6 | 50 | | ✔ | 8,10 | NEW |
| 11 3041 025 | • 8 | 15 | 6 | 60 | ✔ | | 13,05 | |
| 11 3041 026 | • 8 | 15 | 6 | 60 | ✔ | | 8,85 | NEW |
| 11 3041 030 | • 10 | 16 | 6 | 60 | ✔ | | 12,90 | |
| 11 3041 031 | • 10 | 16 | 6 | 60 | ✔ | | 9,70 | NEW |
| 11 3041 035 | • 12 | 22 | 6 | 67 | ✔ | | 18,80 | |
| 11 3041 036 | • 12DIN | 21 | 6 | 66 | ✔ | | 12,95 | NEW |
| 11 3041 037 | • 12DIN | 21 | 6 | 66 | ✔ | | 17,05 | |
| 11 3041 038 | • 12 | 22 | 6 | 175 | ✔ | | 29,20 | |
| 11 3041 040 | • 12 | 22 | 8 | 67 | ✔ | | 20,85 | |
| 11 3041 045 | • 16 | 25 | 6 | 70 | ✔ | | 26,15 | |
| 11 3041 046 | • 16 | 25 | 6 | 70 | ✔ | | 19,70 | NEW |
| 11 3041 050 | • 16 | 25 | 8 | 70 | ✔ | | 29,10 | |
| 11 3041 055 | % 20 | 25 | 6 | 70 | ✔ | | 21,85 | |
| 11 3041 060 | • 20 | 25 | 8 | 70 | ✔ | | 37,20 | |



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## 11 5051

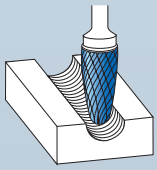
BLUETEC BESCHICHTET COATED



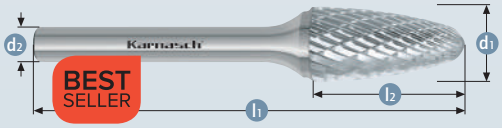

**F** FORM / SHAPE **RBF**

Rundbogen

Ball nosed tree



## 11 3051




NEW VALUETOOL

Schnittdaten Cutting data 753

Film Movie

Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | € |
|---|---|---|---|---|---|---|---|
| 11 5051 007 | • 3 | 6 | 3 | 38 | ✔ | | 7,60 |
| 11 5051 010 | • 3 | 8 | 3 | 38 | | ✔ | 7,60 |
| 11 5051 015 | • 3 | 14 | 3 | 38 | | ✔ | 7,60 |
| | | | | | | | |
| 11 5051 020 | • 3 | 14 | 3 | 50 | | ✔ | 9,90 |
| 11 5051 021 | • 3 | 14 | 3 | 75 | | ✔ | 10,90 |
| 11 5051 022 | • 5 | 12,7 | 3 | 38 | | ✔ | 15,70 |
| 11 5051 025 | • 6 | 12 | 3 | 44 | ✔ | | 11,30 |
| 11 5051 030 | • 6 | 18 | 6 | 50 | | ✔ | 11,80 |
| | | | | | | | |
| 11 5051 033 | • 6 | 18 | 6 | 168 | ✔ | | 28,65 |
| 11 5051 035 | • 8 | 20 | 6 | 65 | ✔ | | 15,70 |
| | | | | | | | |
| 11 5051 040 | • 10 | 20 | 6 | 65 | ✔ | | 15,45 |
| | | | | | | | |
| 11 5051 045 | • 10 | 20 | 6 | 170 | ✔ | | 23,45 |
| 11 5051 047 | • 11 | 25 | 6 | 70 | ✔ | | 21,70 |
| 11 5051 048 | • 12 | 20 | 6 | 65 | ✔ | | 22,80 |
| 11 5051 050 | • 12 | 25 | 6 | 70 | ✔ | | 21,50 |
| 11 5051 053 | • 12DIN | 25 | 6 | 70 | ✔ | | 19,85 |
| | | | | | | | |
| 11 5051 055 | • 12 | 25 | 8 | 70 | ✔ | | 21,50 |
| 11 5051 060 | • 12 | 25 | 6 | 175 | ✔ | | 33,05 |
| 11 5051 065 | • 16 | 25 | 6 | 70 | ✔ | | 29,95 |
| | | | | | | | |
| 11 5051 070 | • 16 | 25 | 8 | 70 | ✔ | | 32,35 |
| 11 5051 075 | • 20 | 25 | 6 | 70 | ✔ | | 39,35 |
| 11 5051 080 | • 20 | 25 | 8 | 70 | ✔ | | 42,45 |
| 11 5051 082 | • 20 | 32 | 6 | 77 | ✔ | | 48,05 |
| 11 5051 085 | • 20 | 38 | 6 | 83 | ✔ | | 55,50 |
| 11 5051 090 | • 20 | 38 | 8 | 83 | ✔ | | 60,00 |

Bestseller – preisreduziert · Bestseller – price reduced

Valuetool – hervorragendes Preis-Leistungs-Verhältnis
Valuetool – excellent price-performance ratio

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | € | |
|---|---|---|---|---|---|---|---|---|
| 11 3051 007 | • 3 | 6 | 3 | 38 | ✔ | | 5,80 | |
| 11 3051 010 | • 3 | 8 | 3 | 38 | | ✔ | 5,80 | |
| 11 3051 015 | • 3 | 14 | 3 | 38 | | ✔ | 5,80 | |
| 11 3051 016 | • 3 | 14 | 3 | 38 | | ✔ | 3,95 | NEW |
| 11 3051 020 | • 3 | 14 | 3 | 50 | | ✔ | 8,10 | |
| | | | | | | | | |
| 11 3051 022 | • 5 | 12,7 | 3 | 38 | | ✔ | 13,95 | |
| 11 3051 025 | • 6 | 12 | 3 | 44 | ✔ | | 9,50 | |
| 11 3051 030 | • 6 | 18 | 6 | 50 | | ✔ | 10,00 | |
| 11 3051 031 | • 6 | 18 | 6 | 50 | | ✔ | 7,55 | NEW |
| 11 3051 033 | • 6 | 18 | 6 | 168 | ✔ | | 25,85 | |
| 11 3051 035 | • 8 | 20 | 6 | 65 | ✔ | | 13,95 | |
| 11 3051 036 | • 8 | 20 | 6 | 65 | ✔ | | 9,65 | NEW |
| 11 3051 040 | • 10 | 20 | 6 | 65 | ✔ | | 12,55 | |
| 11 3051 041 | • 10 | 20 | 6 | 65 | ✔ | | 9,50 | NEW |
| 11 3051 045 | • 10 | 20 | 6 | 170 | ✔ | | 17,65 | |
| 11 3051 047 | • 11 | 25 | 6 | 70 | ✔ | | 17,50 | |
| 11 3051 048 | • 12 | 20 | 6 | 65 | ✔ | | 18,60 | |
| 11 3051 050 | • 12 | 25 | 6 | 70 | ✔ | | 17,30 | |
| 11 3051 053 | • 12DIN | 25 | 6 | 70 | ✔ | | 15,65 | |
| 11 3051 054 | • 12DIN | 25 | 6 | 70 | ✔ | | 12,80 | NEW |
| 11 3051 055 | • 12 | 25 | 8 | 70 | ✔ | | 17,30 | |
| 11 3051 060 | • 12 | 25 | 6 | 175 | ✔ | | 26,00 | |
| 11 3051 065 | • 16 | 25 | 6 | 70 | ✔ | | 25,75 | |
| 11 3051 066 | • 16 | 25 | 6 | 70 | ✔ | | 19,35 | NEW |
| 11 3051 070 | • 16 | 25 | 8 | 70 | ✔ | | 28,15 | |
| 11 3051 075 | • 20 | 25 | 6 | 70 | ✔ | | 33,85 | |
| 11 3051 080 | • 20 | 25 | 8 | 70 | ✔ | | 36,95 | |
| 11 3051 082 | • 20 | 32 | 6 | 77 | ✔ | | 42,55 | |
| 11 3051 085 | • 20 | 38 | 6 | 83 | ✔ | | 50,00 | |
| 11 3051 090 | • 20 | 38 | 8 | 83 | ✔ | | 54,55 | |

11 5061

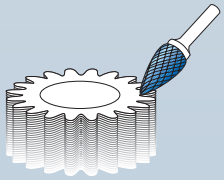
11 3061




G FORM / SHAPE SPG

Spitzbogen

Tree






NEW VALUETOOL

Schnittdaten Cutting data

Film Movie

753

Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | € |
|---|---|---|---|---|---|---|---|
| 11 5061 010 | • 3 | 6 | 3 | 38 | | ✔ | 7,60 |
| 11 5061 012 | • 3 | 10 | 3 | 38 | | ✔ | 7,60 |
| 11 5061 015 | • 3 | 14 | 3 | 38 | | ✔ | 7,60 |
| | | | | | | | |
| 11 5061 020 | • 3 | 14 | 3 | 50 | | ✔ | 9,05 |
| 11 5061 025 | • 3 | 14 | 3 | 75 | | ✔ | 10,70 |
| 11 5061 028 | • 5 | 12,7 | 3 | 38 | | ✔ | 15,70 |
| 11 5061 030 | • 6 | 12 | 3 | 44 | ✔ | | 11,30 |
| 11 5061 035 | • 6 | 18 | 6 | 50 | | ✔ | 11,80 |
| | | | | | | | |
| 11 5061 040 | • 8 | 20 | 6 | 65 | ✔ | | 13,85 |
| | | | | | | | |
| 11 5061 045 | • 10 | 20 | 6 | 65 | ✔ | | 16,30 |
| | | | | | | | |
| 11 5061 050 | • 10 | 20 | 6 | 170 | ✔ | | 24,55 |
| 11 5061 055 | • 12 | 20 | 6 | 65 | ✔ | | 22,50 |
| 11 5061 060 | • 12 | 25 | 6 | 70 | ✔ | | 22,50 |
| 11 5061 063 | • 12DIN | 25 | 6 | 70 | ✔ | | 20,70 |
| | | | | | | | |
| 11 5061 065 | • 12 | 25 | 8 | 70 | ✔ | | 24,15 |
| 11 5061 070 | • 12 | 25 | 6 | 175 | ✔ | | 32,75 |
| 11 5061 075 | • 12 | 30 | 6 | 75 | ✔ | | 26,25 |
| 11 5061 080 | • 12 | 30 | 8 | 75 | ✔ | | 26,25 |
| 11 5061 085 | • 16 | 25 | 6 | 70 | ✔ | | 29,55 |
| | | | | | | | |
| 11 5061 090 | • 16 | 25 | 8 | 70 | ✔ | | 31,55 |
| 11 5061 095 | • 16 | 30 | 6 | 75 | ✔ | | 38,90 |
| 11 5061 100 | • 16 | 30 | 8 | 75 | ✔ | | 38,90 |
| 11 5061 105 | • 20 | 25 | 6 | 70 | ✔ | | 39,35 |
| 11 5061 110 | • 20 | 25 | 8 | 70 | ✔ | | 41,30 |
| 11 5061 115 | • 20 | 38 | 6 | 83 | ✔ | | 55,50 |
| 11 5061 120 | % 20 | 38 | 8 | 83 | ✔ | | 35,80 |

Bestseller – preisreduziert · Bestseller – price reduced

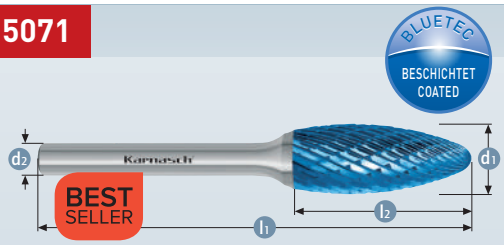
Valuetool – hervorragendes Preis-Leistungs-Verhältnis
Valuetool – excellent price-performance ratio

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | € | |
|---|---|---|---|---|---|---|---|---|
| 11 3061 010 | • 3 | 6 | 3 | 38 | | ✔ | 5,80 | |
| 11 3061 012 | • 3 | 10 | 3 | 38 | | ✔ | 5,80 | |
| 11 3061 015 | • 3 | 14 | 3 | 38 | | ✔ | 5,80 | |
| 11 3061 016 | • 3 | 14 | 3 | 38 | | ✔ | 3,95 | NEW |
| 11 3061 020 | • 3 | 14 | 3 | 50 | | ✔ | 7,30 | |
| | | | | | | | | |
| 11 3061 028 | • 5 | 12,7 | 3 | 38 | | ✔ | 13,95 | |
| 11 3061 030 | • 6 | 12 | 3 | 44 | ✔ | | 9,50 | |
| 11 3061 035 | • 6 | 18 | 6 | 50 | | ✔ | 10,00 | |
| 11 3061 036 | • 6 | 18 | 6 | 50 | | ✔ | 7,55 | NEW |
| 11 3061 040 | • 8 | 20 | 6 | 65 | ✔ | | 12,10 | |
| 11 3061 041 | • 8 | 20 | 6 | 65 | ✔ | | 9,15 | NEW |
| 11 3061 045 | • 10 | 20 | 6 | 65 | ✔ | | 13,40 | |
| 11 3061 046 | • 10 | 20 | 6 | 65 | ✔ | | 10,15 | NEW |
| 11 3061 050 | • 10 | 20 | 6 | 170 | ✔ | | 18,75 | |
| 11 3061 055 | • 12 | 20 | 6 | 65 | ✔ | | 18,30 | |
| 11 3061 060 | • 12 | 25 | 6 | 70 | ✔ | | 18,30 | |
| 11 3061 063 | • 12DIN | 25 | 6 | 70 | ✔ | | 16,45 | |
| 11 3061 064 | • 12DIN | 25 | 6 | 70 | ✔ | | 12,55 | NEW |
| 11 3061 065 | • 12 | 25 | 8 | 70 | ✔ | | 19,95 | |
| 11 3061 070 | • 12 | 25 | 6 | 175 | ✔ | | 25,70 | |
| 11 3061 075 | • 12 | 30 | 6 | 75 | ✔ | | 22,05 | |
| 11 3061 080 | • 12 | 30 | 8 | 75 | ✔ | | 22,05 | |
| 11 3061 085 | • 16 | 25 | 6 | 70 | ✔ | | 25,35 | |
| 11 3061 086 | • 16 | 25 | 6 | 70 | ✔ | | 19,10 | NEW |
| 11 3061 090 | • 16 | 25 | 8 | 70 | ✔ | | 27,35 | |
| 11 3061 095 | • 16 | 30 | 6 | 75 | ✔ | | 34,70 | |
| 11 3061 100 | • 16 | 30 | 8 | 75 | ✔ | | 34,70 | |
| 11 3061 105 | • 20 | 25 | 6 | 70 | ✔ | | 33,85 | |
| 11 3061 110 | % 20 | 25 | 8 | 70 | ✔ | | 22,25 | |
| 11 3061 115 | • 20 | 38 | 6 | 83 | ✔ | | 50,00 | |
| 11 3061 120 | % 20 | 38 | 8 | 83 | ✔ | | 32,45 | |



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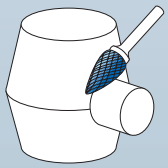
## 11 5071




**H** FORM / SHAPE

Flamme

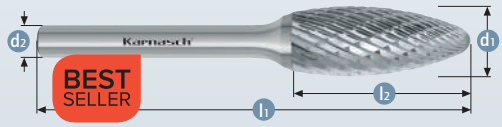
Flame



Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | € |
|---|---|---|---|---|---|---|---|
| 11 5071 003 | ● 3 | 6 | 3 | 50 | | ✔ | 9,35 |
| 11 5071 005 | ● 3 | 6 | 3 | 38 | | ✔ | 7,60 |
| 11 5071 006 | ● 3 | 6 | 3 | 75 | | ✔ | 11,10 |
| 11 5071 007 | ● 5 | 9,5 | 3 | 38 | | ✔ | 15,70 |
| 11 5071 010 | ● 6 | 14 | 6 | 50 | | ✔ | 15,05 |
| 11 5071 015 | ● 8 | 20 | 6 | 65 | ✔ | | 15,00 |
| 11 5071 017 | ● 8 | 20 | 6 | 170 | ✔ | | 25,20 |
| 11 5071 020 | ● 10 | 20 | 6 | 65 | ✔ | | 27,45 |
| 11 5071 025 | ● 12 | 32 | 6 | 77 | ✔ | | 32,35 |
| 11 5071 027 | ● 12DIN | 30 | 6 | 75 | ✔ | | 29,60 |
| 11 5071 028 | ● 12 | 32 | 6 | 180 | ✔ | | 36,25 |
| 11 5071 030 | ● 12 | 32 | 8 | 77 | ✔ | | 32,35 |
| 11 5071 035 | ● 16 | 36 | 6 | 82 | ✔ | | 41,45 |
| 11 5071 040 | ● 16 | 36 | 8 | 82 | ✔ | | 43,40 |
| 11 5071 045 | ● 20 | 41 | 6 | 86 | ✔ | | 52,80 |
| 11 5071 050 | ● 20 | 41 | 8 | 86 | ✔ | | 54,75 |

## 11 3071




NEW VALUETOOL

Schnittdaten Cutting data

753

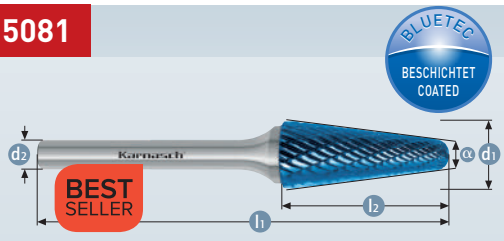
Film Movie

Bestseller – preisreduziert · Bestseller – price reduced

Valuetool – hervorragendes Preis-Leistungs-Verhältnis
Valuetool – excellent price-performance ratio

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | € | |
|---|---|---|---|---|---|---|---|---|
| 11 3071 003 | ● 3 | 6 | 3 | 50 | | ✔ | 7,60 | |
| 11 3071 004 | ● 3 | 6 | 3 | 38 | | ✔ | 3,95 | NEW |
| 11 3071 005 | ● 3 | 6 | 3 | 38 | | ✔ | 5,80 | |
| 11 3071 006 | ● 3 | 6 | 3 | 75 | | ✔ | 9,35 | |
| 11 3071 007 | ● 5 | 9,5 | 3 | 38 | | ✔ | 13,95 | |
| 11 3071 010 | ● 6 | 14 | 6 | 50 | | ✔ | 13,30 | |
| 11 3071 011 | ● 6 | 14 | 6 | 50 | | ✔ | 8,20 | NEW |
| 11 3071 015 | ● 8 | 20 | 6 | 65 | ✔ | | 13,25 | |
| 11 3071 016 | ● 8 | 20 | 6 | 65 | ✔ | | 9,95 | NEW |
| 11 3071 017 | ● 8 | 20 | 6 | 170 | ✔ | | 22,35 | |
| 11 3071 020 | ● 10 | 20 | 6 | 65 | ✔ | | 24,55 | |
| 11 3071 021 | ● 10 | 20 | 6 | 65 | ✔ | | 13,40 | NEW |
| 11 3071 025 | ● 12 | 32 | 6 | 77 | ✔ | | 28,15 | |
| 11 3071 026 | ● 12DIN | 30 | 6 | 75 | ✔ | | 18,50 | NEW |
| 11 3071 027 | ● 12DIN | 30 | 6 | 75 | ✔ | | 25,35 | |
| 11 3071 028 | ● 12 | 32 | 6 | 180 | ✔ | | 29,20 | |
| 11 3071 030 | ● 12 | 32 | 8 | 77 | ✔ | | 28,15 | |
| 11 3071 035 | ● 16 | 36 | 6 | 82 | ✔ | | 37,25 | |
| 11 3071 036 | ● 16 | 36 | 6 | 82 | ✔ | | 28,00 | NEW |
| 11 3071 040 | ● 16 | 36 | 8 | 82 | ✔ | | 39,20 | |
| 11 3071 045 | ● 20 | 41 | 6 | 86 | ✔ | | 47,35 | |
| 11 3071 050 | ● 20 | 41 | 8 | 86 | ✔ | | 49,25 | |

## 11 5081




**L** FORM / SHAPE **KEL**

Rundkegel

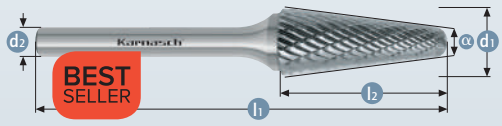
Ball nosed cone



Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | α° | € |
|---|---|---|---|---|---|---|---|---|
| 11 5081 005 | ● 3 | 10 | 3 | 38 | | ✔ | 10° | 7,60 |
| 11 5081 009 | ● 3 | 14 | 3 | 50 | ✔ | | 8° | 9,35 |
| 11 5081 010 | ● 3 | 14 | 3 | 38 | | ✔ | 8° | 7,60 |
| 11 5081 011 | ● 3 | 14 | 3 | 75 | ✔ | | 8° | 11,10 |
| 11 5081 012 | ● 5 | 12,7 | 3 | 38 | | ✔ | 14° | 15,70 |
| 11 5081 015 | ● 6 | 16 | 3 | 48 | ✔ | | 22° | 12,20 |
| 11 5081 020 | ● 6 | 18 | 6 | 50 | | ✔ | 14° | 12,00 |
| 11 5081 025 | ● 8 | 25 | 6 | 70 | ✔ | | 14° | 15,15 |
| 11 5081 030 | ● 10 | 20 | 6 | 65 | ✔ | | 14° | 20,65 |
| 11 5081 035 | ● 10 | 30 | 6 | 75 | ✔ | | 14° | 19,00 |
| 11 5081 040 | ● 10 | 30 | 6 | 176 | ✔ | | 14° | 28,30 |
| 11 5081 045 | ● 12 | 32 | 6 | 77 | ✔ | | 14° | 24,75 |
| 11 5081 047 | ● 12DIN | 25 | 6 | 70 | ✔ | | 14° | 22,75 |
| 11 5081 050 | ● 12 | 32 | 8 | 77 | ✔ | | 14° | 24,75 |
| 11 5081 055 | ● 12 | 32 | 6 | 182 | ✔ | | 14° | 36,85 |
| 11 5081 060 | ● 16 | 33 | 6 | 78 | ✔ | | 14° | 35,95 |
| 11 5081 065 | ● 16 | 33 | 8 | 78 | ✔ | | 14° | 35,95 |
| 11 5081 070 | ● 20 | 41 | 6 | 86 | ✔ | | 14° | 47,40 |
| 11 5081 075 | ● 20 | 41 | 8 | 86 | ✔ | | 14° | 47,40 |

## 11 3081




NEW VALUETOOL

Schnittdaten Cutting data

753

Film Movie

Bestseller – preisreduziert · Bestseller – price reduced

Valuetool – hervorragendes Preis-Leistungs-Verhältnis
Valuetool – excellent price-performance ratio

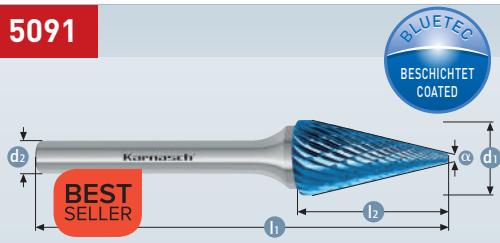
| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | α° | € | |
|---|---|---|---|---|---|---|---|---|---|
| 11 3081 005 | ● 3 | 10 | 3 | 38 | | ✔ | 10° | 5,80 | |
| 11 3081 008 | ● 3 | 14 | 3 | 38 | | ✔ | 10° | 3,95 | NEW |
| 11 3081 009 | ● 3 | 14 | 3 | 50 | ✔ | | 8° | 7,60 | |
| 11 3081 010 | ● 3 | 14 | 3 | 38 | | ✔ | 8° | 5,80 | |
| 11 3081 011 | ● 3 | 14 | 3 | 75 | ✔ | | 8° | 9,35 | |
| 11 3081 012 | ● 5 | 12,7 | 3 | 38 | | ✔ | 14° | 13,95 | |
| 11 3081 015 | ● 6 | 16 | 3 | 48 | ✔ | | 22° | 10,45 | |
| 11 3081 020 | ● 6 | 18 | 6 | 50 | | ✔ | 14° | 10,20 | |
| 11 3081 021 | ● 6 | 18 | 6 | 50 | | ✔ | 14° | 7,70 | NEW |
| 11 3081 025 | ● 8 | 25 | 6 | 70 | ✔ | | 14° | 13,35 | |
| 11 3081 026 | ● 8 | 25 | 6 | 70 | ✔ | | 14° | 10,10 | NEW |
| 11 3081 030 | ● 10 | 20 | 6 | 65 | ✔ | | 14° | 17,80 | |
| 11 3081 031 | ● 10 | 20 | 6 | 65 | ✔ | | 14° | 13,15 | NEW |
| 11 3081 035 | ● 10 | 30 | 6 | 75 | ✔ | | 14° | 16,15 | |
| 11 3081 040 | ● 10 | 30 | 6 | 176 | ✔ | | 14° | 22,50 | |
| 11 3081 045 | ● 12 | 32 | 6 | 77 | ✔ | | 14° | 20,55 | |
| 11 3081 047 | ● 12DIN | 25 | 6 | 70 | ✔ | | 14° | 18,55 | |
| 11 3081 048 | ● 12DIN | 25 | 6 | 70 | ✔ | | 14° | 13,50 | NEW |
| 11 3081 050 | ● 12 | 32 | 8 | 77 | ✔ | | 14° | 20,55 | |
| 11 3081 055 | ● 12 | 32 | 6 | 182 | ✔ | | 14° | 29,80 | |
| 11 3081 060 | ● 16 | 33 | 6 | 78 | ✔ | | 14° | 31,75 | |
| 11 3081 061 | ● 16 | 33 | 6 | 78 | ✔ | | 14° | 24,40 | NEW |
| 11 3081 065 | ● 16 | 33 | 8 | 78 | ✔ | | 14° | 31,75 | |
| 11 3081 070 | ● 20 | 41 | 6 | 86 | ✔ | | 14° | 41,95 | |
| 11 3081 075 | ● 20 | 41 | 8 | 86 | ✔ | | 14° | 41,95 | |

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



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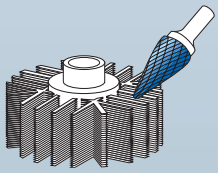
## 11 5091



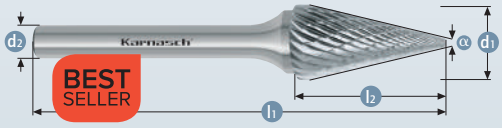

**M** FORM / SHAPE **SKM**

Spitzkegel

Cone



## 11 3091




NEW VALUETOOL

Schnittdaten Cutting data | Film Movie

753

Bestseller – preisreduziert · Bestseller – price reduced

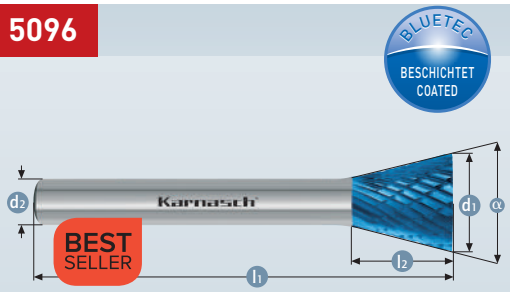
Valuetool – hervorragendes Preis-Leistungs-Verhältnis
Valuetool – excellent price-performance ratio

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | α° | € |
|---|---|---|---|---|---|---|---|---|
| 11 5091 010 | ● 3 | 8 | 3 | 38 | | ✔ | 18° | 7,60 |
| 11 5091 015 | ● 3 | 11 | 3 | 38 | | ✔ | 14° | 7,60 |
| 11 5091 020 | ● 3 | 15 | 3 | 38 | | ✔ | 10° | 7,60 |
| 11 5091 025 | ● 6 | 12 | 3 | 48 | ✔ | | 22° | 11,30 |
| 11 5091 027 | ● 6 | 12,7 | 6 | 50 | | ✔ | 14° | 11,45 |
| 11 5091 030 | ● 6 | 20 | 6 | 50 | | ✔ | 14° | 12,00 |
| 11 5091 032 | ● 6 | 25 | 6 | 50 | | ✔ | 11° | 12,70 |
| 11 5091 035 | ● 8 | 18 | 6 | 63 | ✔ | | 13° | 15,15 |
| 11 5091 040 | ● 10 | 20 | 6 | 65 | ✔ | | 28° | 19,45 |
| 11 5091 045 | ● 12 | 25 | 6 | 70 | ✔ | | 28° | 24,15 |
| 11 5091 047 | ● 12DIN | 25 | 6 | 70 | ✔ | | 28° | 23,55 |
| 11 5091 050 | ● 12 | 25 | 8 | 70 | ✔ | | 28° | 24,15 |
| 11 5091 055 | ● 16 | 26 | 6 | 74 | ✔ | | 33° | 31,15 |
| 11 5091 060 | ● 16 | 26 | 8 | 74 | ✔ | | 33° | 33,95 |

Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | α° | € | |
|---|---|---|---|---|---|---|---|---|---|
| 11 3091 010 | ● 3 | 8 | 3 | 38 | | ✔ | 18° | 5,80 | |
| 11 3091 015 | ● 3 | 11 | 3 | 38 | | ✔ | 14° | 5,80 | |
| 11 3091 016 | ● 3 | 11 | 3 | 38 | | ✔ | 14° | 3,95 | NEW |
| 11 3091 020 | ● 3 | 15 | 3 | 38 | | ✔ | 10° | 5,80 | |
| 11 3091 025 | ● 6 | 12 | 3 | 48 | ✔ | | 22° | 9,50 | |
| 11 3091 027 | ● 6 | 12,7 | 6 | 50 | | ✔ | 14° | 9,70 | |
| 11 3091 030 | ● 6 | 20 | 6 | 50 | | ✔ | 14° | 10,20 | |
| 11 3091 031 | ● 6 | 20 | 6 | 50 | | ✔ | 14° | 7,70 | NEW |
| 11 3091 032 | ● 6 | 25 | 6 | 50 | | ✔ | 11° | 10,95 | |
| 11 3091 035 | ● 8 | 18 | 6 | 63 | ✔ | | 13° | 13,35 | |
| 11 3091 036 | ● 8 | 18 | 6 | 63 | ✔ | | 13° | 10,30 | NEW |
| 11 3091 040 | ● 10 | 20 | 6 | 65 | ✔ | | 28° | 16,55 | |
| 11 3091 041 | ● 10 | 20 | 6 | 65 | ✔ | | 28° | 12,15 | NEW |
| 11 3091 045 | ● 12 | 25 | 6 | 70 | ✔ | | 28° | 19,95 | |
| 11 3091 047 | ● 12DIN | 25 | 6 | 70 | ✔ | | 28° | 18,00 | |
| 11 3091 048 | ● 12DIN | 25 | 6 | 70 | ✔ | | 28° | 13,85 | NEW |
| 11 3091 050 | ● 12 | 25 | 8 | 70 | ✔ | | 28° | 19,95 | |
| 11 3091 055 | ● 16 | 26 | 6 | 74 | ✔ | | 33° | 26,95 | |
| 11 3091 056 | ● 16 | 26 | 6 | 74 | ✔ | | 33° | 20,25 | NEW |
| 11 3091 060 | ● 16 | 26 | 8 | 74 | ✔ | | 33° | 29,75 | |

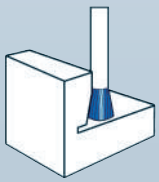
## 11 5096




**N** FORM / SHAPE **WKN**

Winkel

Inverted cone



## 11 3096




Schnittdaten Cutting data | Film Movie

753

Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | α° | € |
|---|---|---|---|---|---|---|---|---|
| 11 5096 005 | ● 3 | 5 | 3 | 38 | | ✔ | 10° | 7,45 |
| 11 5096 010 | ● 6 | 7 | 3 | 39 | ✔ | | 10° | 11,30 |
| 11 5096 015 | ● 6 | 8 | 6 | 50 | | ✔ | 10° | 11,50 |
| 11 5096 020 | ● 10 | 10 | 6 | 55 | ✔ | | 13° | 17,10 |
| 11 5096 025 | ● 12 | 13 | 6 | 58 | ✔ | | 30° | 24,35 |
| 11 5096 030 | ● 12 | 13 | 8 | 58 | ✔ | | 30° | 26,45 |
| 11 5096 035 | ● 16 | 19 | 6 | 64 | ✔ | | 18° | 30,05 |
| 11 5096 040 | ● 16 | 19 | 8 | 64 | ✔ | | 18° | 32,05 |
| 11 5096 045 | ● 20 | 16 | 6 | 61 | ✔ | | 30° | 34,50 |

Bestseller – preisreduziert · Bestseller – price reduced

| Art. | d1 | l2 | d2 | l1 | gelötet brazed | VHM solid | α° | € |
|---|---|---|---|---|---|---|---|---|
| 11 3096 005 | ● 3 | 5 | 3 | 38 | | ✔ | 10° | 5,70 |
| 11 3096 010 | ● 6 | 7 | 3 | 39 | ✔ | | 10° | 9,50 |
| 11 3096 015 | ● 6 | 8 | 6 | 50 | | ✔ | 10° | 9,75 |
| 11 3096 020 | ● 10 | 10 | 6 | 55 | ✔ | | 13° | 14,20 |
| 11 3096 025 | ● 12 | 13 | 6 | 58 | ✔ | | 30° | 20,15 |
| 11 3096 030 | ● 12 | 13 | 8 | 58 | ✔ | | 30° | 22,25 |
| 11 3096 035 | ● 16 | 19 | 6 | 64 | ✔ | | 18° | 25,85 |
| 11 3096 040 | ● 16 | 19 | 8 | 64 | ✔ | | 18° | 27,85 |
| 11 3096 045 | ● 20 | 16 | 6 | 61 | ✔ | | 30° | 29,00 |



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## 11 4964

BEST SELLER

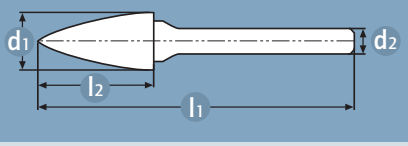
€ 108,10




5 Stück

5 pieces

Film
Movie



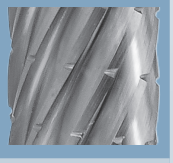

BEST SELLER Bestseller – preisreduziert
Bestseller – price reduced

GREENTEC BESCHICHTET COATED

## HP-3 Pro Performance 82



Zahnung
Cut



| Art. | d1 | l2 | d2 | l1 | Form Shape | DIN 8033 | Inhalt \| Contents |
|---|---|---|---|---|---|---|---|
| 11 6091 030 | • 10 | 20 | 6 | 65 | B | ZYB | 1× Zylinder mit Stirnverzahnung<br>Cylinder with end cut |
| 11 6092 030 | • 10 | 20 | 6 | 65 | C | WRC | 1× Walzenrundform<br>Ball nosed cylinder |
| 11 6095 030 | • 10 | 20 | 6 | 65 | F | RBF | 1× Rundbogen<br>Ball nosed tree |
| 11 6096 030 | • 10 | 20 | 6 | 65 | G | SPG | 1× Spitzbogen<br>Tree |
| 11 6098 030 | • 10 | 20 | 6 | 65 | L | KEL | 1× Rundkegel<br>Ball nosed cone |

## 11 4964 U

BEST SELLER

€ 88,95




BEST SELLER Bestseller – preisreduziert
Bestseller – price reduced

| Art. | d1 | l2 | d2 | l1 |
|---|---|---|---|---|
| 11 4091 030 | • 10 | 20 | 6 | 65 |
| 11 4092 030 | • 10 | 20 | 6 | 65 |
| 11 4095 030 | • 10 | 20 | 6 | 65 |
| 11 4096 030 | • 10 | 20 | 6 | 65 |
| 11 4098 030 | • 10 | 20 | 6 | 65 |

## 11 4947

Leeres Set / Empty set

€ 9,50



**Sie wollen einen anderen Inhalt? Kein Problem!** Wählen Sie aus unserem Gesamtsortiment 6 mm Schäfte aus. Beachten Sie dabei die maximale Länge von 86 mm.

**Would you like a display of mini-burrs? No problem!** Select 6.0 mm shafts from the complete list of products. Note that the maximum length is 86 mm.

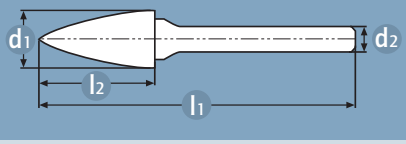
**11 4966** BEST SELLER € 148,40




5 Stück

5 pieces

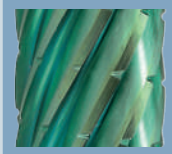
Film
Movie



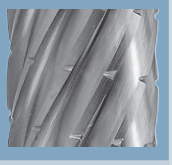

BEST SELLER Bestseller – preisreduziert
Bestseller – price reduced

GREENTEC BESCHICHTET COATED

**HP-3 Pro Performance 82**



Zahnung
Cut



| Art. | d1 | l2 | d2 | l1 | Form Shape | DIN 8033 | Inhalt \| Contents |
|---|---|---|---|---|---|---|---|
| 11 6091 040 | • 12 | 25 | 6 | 70 | B | ZYB | 1× Zylinder mit Stirnverzahnung<br>Cylinder with end cut |
| 11 6092 040 | • 12 | 25 | 6 | 70 | C | WRC | 1× Walzenrundform<br>Ball nosed cylinder |
| 11 6095 040 | • 12 | 25 | 6 | 70 | F | RBF | 1× Rundbogen<br>Ball nosed tree |
| 11 6096 040 | • 12 | 25 | 6 | 70 | G | SPG | 1× Spitzbogen<br>Tree |
| 11 6098 040 | • 12 | 25 | 6 | 70 | L | KEL | 1× Rundkegel<br>Ball nosed cone |

BEST SELLER € 128,65 **11 4966 U**




BEST SELLER Bestseller – preisreduziert
Bestseller – price reduced

| Art. | d1 | l2 | d2 | l1 |
|---|---|---|---|---|
| 11 4091 040 | • 12 | 25 | 6 | 70 |
| 11 4092 040 | • 12 | 25 | 6 | 70 |
| 11 4095 040 | • 12 | 25 | 6 | 70 |
| 11 4096 040 | • 12 | 25 | 6 | 70 |
| 11 4098 040 | • 12 | 25 | 6 | 70 |



**11 4947**

**Leeres Set / Empty set**

€ 9,50



**Sie wollen einen anderen Inhalt? Kein Problem!** Wählen Sie aus unserem Gesamtsortiment 6 mm Schäfte aus. Beachten Sie dabei die maximale Länge von 86 mm.

**Would you like a display of mini-burrs? No problem!** Select 6.0 mm shafts from the complete list of products. Note that the maximum length is 86 mm.

## 11 4918

BEST SELLER

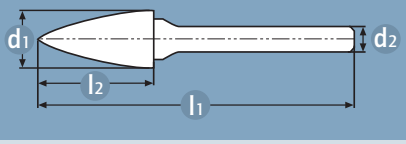
€ 98,65



5 Stück

5 pieces

Film
Movie



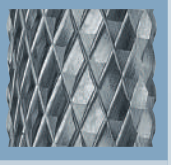

BEST SELLER Bestseller – preisreduziert
Bestseller – price reduced

BLUETEC BESCHICHTET COATED

### Universal HP-3



Zahnung
Cut



| Art. | d1 | l2 | d2 | l1 | Form Shape | DIN 8033 | Inhalt \| Contents |
|---|---|---|---|---|---|---|---|
| 11 5011 085 | • 10 | 20 | 6 | 65 | B | ZYB | 1× Zylinder mit Stirnverzahnung<br>Cylinder with end cut |
| 11 5021 085 | • 10 | 20 | 6 | 65 | C | WRC | 1× Walzenrundform<br>Ball nosed cylinder |
| 11 5051 040 | • 10 | 20 | 6 | 65 | F | RBF | 1× Rundbogen<br>Ball nosed tree |
| 11 5061 045 | • 10 | 20 | 6 | 65 | G | SPG | 1× Spitzbogen<br>Tree |
| 11 5081 035 | • 10 | 30 | 6 | 75 | L | KEL | 1× Rundkegel<br>Ball nosed cone |

## 11 4918 U

BEST SELLER

€ 75,30

## 11 4919 U

VALUETOOL

€ 59,65

neu new



BEST SELLER Bestseller – preisreduziert
Bestseller – price reduced

VALUETOOL

Valuetool – hervorragendes Preis-Leistungs-Verhältnis
Valuetool – excellent price-performance ratio

| Art. BESTSELLER | Art. VALUETOOL | d1 | l2 | d2 | l1 |
|---|---|---|---|---|---|
| 11 3011 085 | 11 3011 086 | • 10 | 20 | 6 | 65 |
| 11 3021 085 | 11 3021 086 | • 10 | 20 | 6 | 65 |
| 11 3051 040 | 11 3051 041 | • 10 | 20 | 6 | 65 |
| 11 3061 045 | 11 3061 046 | • 10 | 20 | 6 | 65 |
| 11 3081 035 | 11 3081 031 | • 10 | 30<br>20 | 6 | 75<br>65 |

## 11 4947

Leeres Set / Empty set

€ 9,50



**Sie wollen einen anderen Inhalt? Kein Problem!** Wählen Sie aus unserem Gesamtsortiment 6 mm Schäfte aus. Beachten Sie dabei die maximale Länge von 86 mm.

**Would you like a display of mini-burrs? No problem!** Select 6.0 mm shafts from the complete list of products. Note that the maximum length is 86 mm.

**11 4926** BEST SELLER € 124,80



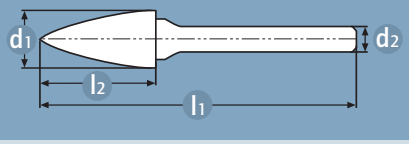
BEST SELLER Bestseller – preisreduziert
Bestseller – price reduced

BLUETEC BESCHICHTET COATED

5 Stück

5 pieces

Film
Movie




BEST SELLER € 103,80 **11 4926 U**

VALUETOOL € 73,95 neu new **11 4927 U**



BEST SELLER Bestseller – preisreduziert
Bestseller – price reduced

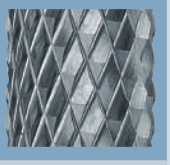
VALUETOOL

Valuetool – hervorragendes Preis-Leistungs-Verhältnis
Valuetool – excellent price-performance ratio

## Universal HP-3



Zahnung
Cut



| Art. | d1 | l2 | d2 | l1 | Form Shape | DIN 8033 | Inhalt \| Contents |
|---|---|---|---|---|---|---|---|
| 11 5011 100 | • 12 | 25 | 6 | 70 | B | ZYB | 1× Zylinder mit Stirnverzahnung<br>Cylinder with end cut |
| 11 5021 105 | • 12 | 25 | 6 | 70 | C | WRC | 1× Walzenrundform<br>Ball nosed cylinder |
| 11 5051 050 | • 12 | 25 | 6 | 70 | F | RBF | 1× Rundbogen<br>Ball nosed tree |
| 11 5061 060 | • 12 | 25 | 6 | 70 | G | SPG | 1× Spitzbogen<br>Tree |
| 11 5081 045 | • 12 | 25 | 6 | 77 | L | KEL | 1× Rundkegel<br>Ball nosed cone |

| Art. BESTSELLER | Art. VALUETOOL | d1 | l2 | d2 | l1 |
|---|---|---|---|---|---|
| 11 3011 100 | 11 3011 104 | • 12 | 25 | 6 | 70 |
| 11 3021 105 | 11 3021 108 | • 12 | 25 | 6 | 70 |
| 11 3051 050 | 11 3051 054 | • 12 | 25 | 6 | 70 |
| 11 3061 060 | 11 3061 064 | • 12 | 25 | 6 | 70 |
| 11 3081 045 | 11 3081 048 | • 12 | 32<br>25 | 6 | 77<br>70 |

**Sie wollen einen anderen Inhalt? Kein Problem!** Wählen Sie aus unserem Gesamtsortiment 6 mm Schäfte aus. Beachten Sie dabei die maximale Länge von 86 mm.

**Would you like a display of mini-burrs? No problem!** Select 6.0 mm shafts from the complete list of products. Note that the maximum length is 86 mm.



**11 4947**

Leeres Set /
Empty set

€ 9,50

## 11 4907

BEST SELLER

€ 115,45

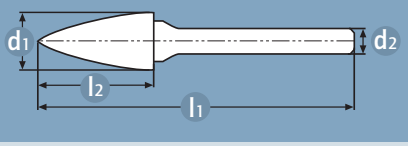
DIN



5 Stück

5 pieces

Film
Movie



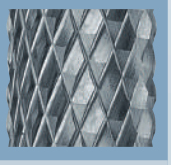

BEST SELLER Bestseller – preisreduziert
Bestseller – price reduced

BLUETEC BESCHICHTET COATED

### Universal HP-3



Zahnung
Cut



| Art. | d1 | l2 | d2 | l1 | Form Shape | DIN 8033 | Inhalt \| Contents |
|---|---|---|---|---|---|---|---|
| 11 5011 103 | • 12,0 DIN | 25 | 6 | 70 | B | ZYB | 1× Zylinder mit Stirnverzahnung<br>Cylinder with end cut |
| 11 5021 107 | • 12,0 DIN | 25 | 6 | 70 | C | WRC | 1× Walzenrundform<br>Ball nosed cylinder |
| 11 5051 053 | • 12,0 DIN | 25 | 6 | 70 | F | RBF | 1× Rundbogen<br>Ball nosed tree |
| 11 5061 063 | • 12,0 DIN | 25 | 6 | 70 | G | SPG | 1× Spitzbogen<br>Tree |
| 11 5081 047 | • 12,0 DIN | 25 | 6 | 70 | L | KEL | 1× Rundkegel<br>Ball nosed cone |

## 11 4907 U

BEST SELLER

€ 94,40

DIN



BEST SELLER Bestseller – preisreduziert
Bestseller – price reduced

| Art. | d1 | l2 | d2 | l1 |
|---|---|---|---|---|
| 11 3011 103 | • 12,0 DIN | 25 | 6 | 70 |
| 11 3021 107 | • 12,0 DIN | 25 | 6 | 70 |
| 11 3051 053 | • 12,0 DIN | 25 | 6 | 70 |
| 11 3061 063 | • 12,0 DIN | 25 | 6 | 70 |
| 11 3081 047 | • 12,0 DIN | 25 | 6 | 70 |

## 11 4947

Leeres Set / Empty set

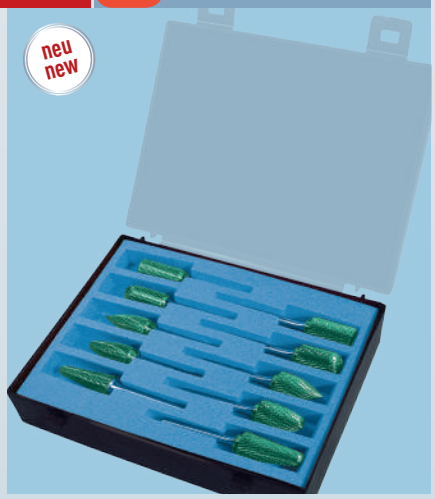
€ 9,50



**Sie wollen einen anderen Inhalt? Kein Problem!** Wählen Sie aus unserem Gesamtsortiment 6 mm Schäfte aus. Beachten Sie dabei die maximale Länge von 86 mm.

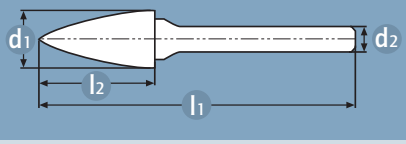
**Would you like a display of mini-burrs? No problem!** Select 6.0 mm shafts from the complete list of products. Note that the maximum length is 86 mm.

**11 4968** BEST SELLER € 248,15




10 Stück
10 pieces

Film
Movie




BEST SELLER € 209,25 **11 4968 U**




BEST SELLER Bestseller – preisreduziert
Bestseller – price reduced

GREENTEC BESCHICHTET COATED

BEST SELLER Bestseller – preisreduziert
Bestseller – price reduced

## HP-3 Pro Performance 82




| Art. | d1 | l2 | d2 | l1 | Form Shape | DIN 8033 | Inhalt \| Contents |
|---|---|---|---|---|---|---|---|
| 11 6091 030 | • 10 | 20 | 6 | 65 | B | ZYB | 1× Zylinder mit Stirnverzahnung<br>Cylinder with end cut |
| 11 6092 030 | • 10 | 20 | 6 | 65 | C | WRC | 1× Walzenrundform<br>Ball nosed cylinder |
| 11 6095 030 | • 10 | 20 | 6 | 65 | F | RBF | 1× Rundbogen<br>Ball nosed tree |
| 11 6096 030 | • 10 | 20 | 6 | 65 | G | SPG | 1× Spitzbogen<br>Tree |
| 11 6098 030 | • 10 | 20 | 6 | 65 | L | KEL | 1× Rundkegel<br>Ball nosed cone |
| 11 6091 040 | • 12 | 25 | 6 | 70 | B | ZYB | 1× Zylinder mit Stirnverzahnung<br>Cylinder with end cut |
| 11 6092 040 | • 12 | 25 | 6 | 70 | C | WRC | 1× Walzenrundform<br>Ball nosed cylinder |
| 11 6095 040 | • 12 | 25 | 6 | 70 | F | RBF | 1× Rundbogen<br>Ball nosed tree |
| 11 6096 040 | • 12 | 25 | 6 | 70 | G | SPG | 1× Spitzbogen<br>Tree |
| 11 6098 040 | • 12 | 25 | 6 | 77 | L | KEL | 1× Rundkegel<br>Ball nosed cone |

| Art. | d1 | l2 | d2 | l1 |
|---|---|---|---|---|
| 11 4091 030 | • 10 | 20 | 6 | 65 |
| 11 4092 030 | • 10 | 20 | 6 | 65 |
| 11 4095 030 | • 10 | 20 | 6 | 65 |
| 11 4096 030 | • 10 | 20 | 6 | 65 |
| 11 4098 030 | • 10 | 20 | 6 | 65 |
| 11 4091 040 | • 12 | 25 | 6 | 70 |
| 11 4092 040 | • 12 | 25 | 6 | 70 |
| 11 4095 040 | • 12 | 25 | 6 | 70 |
| 11 4096 040 | • 12 | 25 | 6 | 70 |
| 11 4098 040 | • 12 | 25 | 6 | 77 |

**11 4950**
Leeres Set / Empty set
€ 9,50



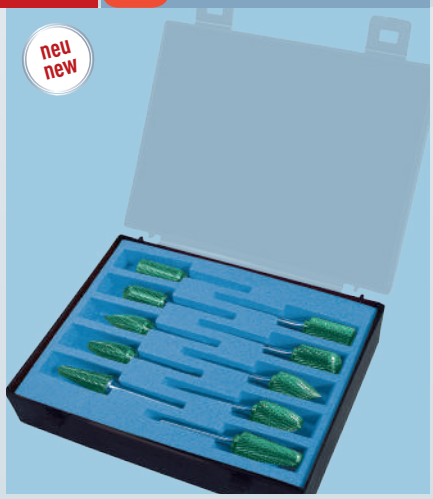
**Sie wollen einen anderen Inhalt? Kein Problem!** Wählen Sie aus unserem Gesamtsortiment 6 mm Schäfte aus. Beachten Sie dabei die maximale Länge von 86 mm.

**Would you like a display of mini-burrs? No problem!** Select 6.0 mm shafts from the complete list of products. Note that the maximum length is 86 mm.

## 11 4970

BEST SELLER

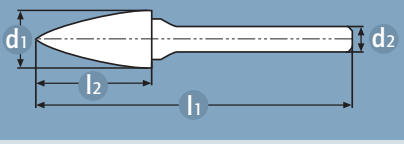
€ 290,55




10 Stück

10 pieces

Film
Movie



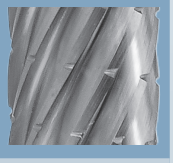

BEST SELLER Bestseller – preisreduziert
Bestseller – price reduced

GREENTEC BESCHICHTET COATED

## HP-3 Pro Performance 82



Zahnung
Cut



| Art. | d1 | l2 | d2 | l1 | Form Shape | DIN 8033 | Inhalt \| Contents |
|---|---|---|---|---|---|---|---|
| 11 6090 040 | • 12 | 25 | 6 | 70 | A | ZYA | 1× Zylinder ohne Stirnverzahnung<br>Cylinder without end cut |
| 11 6091 040 | • 12 | 25 | 6 | 70 | B | ZYB | 1× Zylinder mit Stirnverzahnung<br>Cylinder with end cut |
| 11 6092 040 | • 12 | 25 | 6 | 70 | C | WRC | 1× Walzenrundform<br>Ball nosed cylinder |
| 11 6093 040 | • 12 | 11 | 6 | 56 | D | KUD | 1× Kugel<br>Ball |
| 11 6094 040 | • 12 | 21 | 6 | 66 | E | TRE | 1× Tropfen<br>Oval |
| 11 6095 040 | • 12 | 25 | 6 | 70 | F | RBF | 1× Rundbogen<br>Ball nosed tree |
| 11 6096 040 | • 12 | 25 | 6 | 70 | G | SPG | 1× Spitzbogen<br>Tree |
| 11 6097 040 | • 12 | 30 | 6 | 75 | H | – | 1× Flamme<br>Flame |
| 11 6098 040 | • 12 | 25 | 6 | 70 | L | KEL | 1× Rundkegel<br>Ball nosed cone |
| 11 6099 040 | • 12 | 25 | 6 | 70 | M | SKM | 1× Spitzkegel<br>Cone |

## 11 4970 U

BEST SELLER

€ 251,10




BEST SELLER Bestseller – preisreduziert
Bestseller – price reduced

| Art. | d1 | l2 | d2 | l1 |
|---|---|---|---|---|
| 11 4090 040 | • 12 | 25 | 6 | 70 |
| 11 4091 040 | • 12 | 25 | 6 | 70 |
| 11 4092 040 | • 12 | 25 | 6 | 70 |
| 11 4093 040 | • 12 | 11 | 6 | 56 |
| 11 4094 040 | • 12 | 21 | 6 | 66 |
| 11 4095 040 | • 12 | 25 | 6 | 70 |
| 11 4096 040 | • 12 | 25 | 6 | 70 |
| 11 4097 040 | • 12 | 30 | 6 | 75 |
| 11 4098 040 | • 12 | 25 | 6 | 70 |
| 11 4099 040 | • 12 | 25 | 6 | 70 |

## 11 4950

Leeres Set / Empty set

€ 9,50



**Sie wollen einen anderen Inhalt? Kein Problem!** Wählen Sie aus unserem Gesamtsortiment 6 mm Schäfte aus. Beachten Sie dabei die maximale Länge von 86 mm.

**Would you like a display of mini-burrs? No problem!** Select 6.0 mm shafts from the complete list of products. Note that the maximum length is 86 mm.

**11 4934** BEST SELLER € 216,30

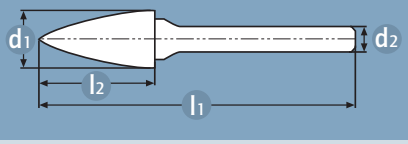


BEST SELLER Bestseller – preisreduziert
Bestseller – price reduced

BLUETEC BESCHICHTET COATED

10 Stück
10 pieces

Film
Movie




BEST SELLER € 171,95 **11 4934 U**

VALUETOOL € 126,45 neu new **11 4935 U**



BEST SELLER Bestseller – preisreduziert
Bestseller – price reduced

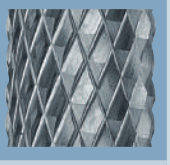
VALUETOOL

Valuetool – hervorragendes Preis-Leistungs-Verhältnis
Valuetool – excellent price-performance ratio

## Universal HP-3



Zahnung
Cut



| Art. | d1 | l2 | d2 | l1 | Form Shape | DIN 8033 | Inhalt \| Contents | Art. BESTSELLER | Art. VALUETOOL | d1 | l2 | d2 | l1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 5011 085 | • 10 | 20 | 6 | 65 | B | ZYB | 1× Zylinder mit Stirnverzahnung<br>Cylinder with end cut | 11 3011 085 | 11 3011 086 | • 10 | 20 | 6 | 65 |
| 11 5021 085 | • 10 | 20 | 6 | 65 | C | WRC | 1× Walzenrundform<br>Ball nosed cylinder | 11 3021 085 | 11 3021 086 | • 10 | 20 | 6 | 65 |
| 11 5051 040 | • 10 | 20 | 6 | 65 | F | RBF | 1× Rundbogen<br>Ball nosed tree | 11 3051 040 | 11 3051 041 | • 10 | 20 | 6 | 65 |
| 11 5061 045 | • 10 | 20 | 6 | 65 | G | SPG | 1× Spitzbogen<br>Tree | 11 3061 045 | 11 3061 046 | • 10 | 20 | 6 | 65 |
| 11 5081 035 | • 10 | 30 | 6 | 75 | L | KEL | 1× Rundkegel<br>Ball nosed cone | 11 3081 035 | 11 3081 031 | • 10 | 30<br>20 | 6 | 75<br>65 |
| 11 5011 100 | • 12 | 25 | 6 | 70 | B | ZYB | 1× Zylinder mit Stirnverzahnung<br>Cylinder with end cut | 11 3011 100 | 11 3011 104 | • 12 | 25 | 6 | 70 |
| 11 5021 105 | • 12 | 25 | 6 | 70 | C | WRC | 1× Walzenrundform<br>Ball nosed cylinder | 11 3021 105 | 11 3021 108 | • 12 | 25 | 6 | 70 |
| 11 5051 050 | • 12 | 25 | 6 | 70 | F | RBF | 1× Rundbogen<br>Ball nosed tree | 11 3051 050 | 11 3051 054 | • 12 | 25 | 6 | 70 |
| 11 5061 060 | • 12 | 25 | 6 | 70 | G | SPG | 1× Spitzbogen<br>Tree | 11 3061 060 | 11 3061 064 | • 12 | 25 | 6 | 70 |
| 11 5081 045 | • 12 | 32 | 6 | 77 | L | KEL | 1× Rundkegel<br>Ball nosed cone | 11 3081 045 | 11 3081 048 | • 12 | 32<br>25 | 6 | 77<br>70 |

**11 4950**
Leeres Set / Empty set
€ 9,50



**Sie wollen einen anderen Inhalt? Kein Problem!** Wählen Sie aus unserem Gesamtsortiment 6 mm Schäfte aus. Beachten Sie dabei die maximale Länge von 86 mm.

**Would you like a display of mini-burrs? No problem!** Select 6.0 mm shafts from the complete list of products. Note that the maximum length is 86 mm.

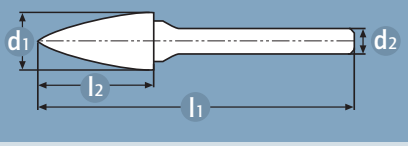
**11 4942** BEST SELLER € 245,40



10 Stück

10 pieces

Film
Movie




BEST SELLER € 203,35 **11 4942 U**

VALUETOOL € 141,85 neu new **11 4943 U**



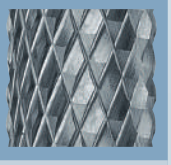
BEST SELLER Bestseller – preisreduziert
Bestseller – price reduced

BLUETEC BESCHICHTET COATED

## Universal HP-3



Zahnung
Cut



BEST SELLER Bestseller – preisreduziert
Bestseller – price reduced

VALUETOOL

Valuetool – hervorragendes Preis-Leistungs-Verhältnis
Valuetool – excellent price-performance ratio

| Art. | d1 | l2 | d2 | l1 | Form Shape | DIN 8033 | Inhalt \| Contents |
|---|---|---|---|---|---|---|---|
| 11 5001 105 | • 12 | 25 | 6 | 70 | A | ZYA | 1× Zylinder ohne Stirnverzahnung<br>Cylinder without end cut |
| 11 5011 100 | • 12 | 25 | 6 | 70 | B | ZYB | 1× Zylinder mit Stirnverzahnung<br>Cylinder with end cut |
| 11 5021 105 | • 12 | 25 | 6 | 70 | C | WRC | 1× Walzenrundform<br>Ball nosed cylinder |
| 11 5031 080 | • 12 | 11,4 | 6 | 65 | D | KUD | 1× Kugel<br>Ball |
| 11 5041 035 | • 12 | 22 | 6 | 67 | E | TRE | 1× Tropfen<br>Oval |
| 11 5051 050 | • 12 | 25 | 6 | 70 | F | RBF | 1× Rundbogen<br>Ball nosed tree |
| 11 5061 060 | • 12 | 25 | 6 | 70 | G | SPG | 1× Spitzbogen<br>Tree |
| 11 5071 025 | • 12 | 32 | 6 | 77 | H | – | 1× Flamme<br>Flame |
| 11 5081 045 | • 12 | 32 | 6 | 77 | L | KEL | 1× Rundkegel<br>Ball nosed cone |
| 11 5091 045 | • 12 | 25 | 6 | 70 | M | SKM | 1× Spitzkegel<br>Cone |

| Art. BESTSELLER | Art. VALUETOOL | d1 | l2 | d2 | l1 |
|---|---|---|---|---|---|
| 11 3001 105 | 11 3001 108 | • 12 | 25 | 6 | 70 |
| 11 3011 100 | 11 3011 104 | • 12 | 25 | 6 | 70 |
| 11 3021 105 | 11 3021 108 | • 12 | 25 | 6 | 70 |
| 11 3031 080 | 11 3031 084 | • 12 | 11,4<br>11 | 6 | 65<br>56 |
| 11 3041 035 | 11 3041 036 | • 12 | 22<br>21 | 6 | 67<br>66 |
| 11 3051 050 | 11 3051 054 | • 12 | 25 | 6 | 70 |
| 11 3061 060 | 11 3061 064 | • 12 | 25 | 6 | 70 |
| 11 3071 025 | 11 3071 026 | • 12 | 32<br>30 | 6 | 77<br>75 |
| 11 3081 045 | 11 3081 048 | • 12 | 32<br>25 | 6 | 77<br>70 |
| 11 3091 045 | 11 3091 048 | • 12 | 25 | 6 | 70 |

**11 4950**

**Leeres Set / Empty set**

€ 9,50



**Sie wollen einen anderen Inhalt? Kein Problem!** Wählen Sie aus unserem Gesamtsortiment 6 mm Schäfte aus. Beachten Sie dabei die maximale Länge von 86 mm.

**Would you like a display of mini-burrs? No problem!** Select 6.0 mm shafts from the complete list of products. Note that the maximum length is 86 mm.



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

## 11 4911

BEST SELLER

€ 227,80

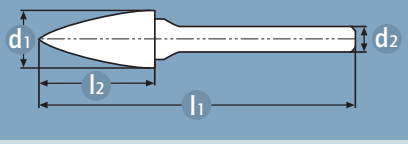
DIN



10 Stück

10 pieces

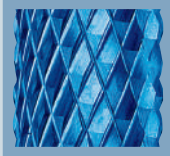
Film
Movie



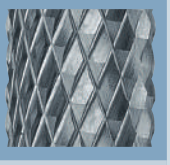

BEST SELLER Bestseller – preisreduziert
Bestseller – price reduced

BLUETEC BESCHICHTET COATED

### Universal HP-3



Zahnung
Cut



| Art. | d1 | l2 | d2 | l1 | Form Shape | DIN 8033 | Inhalt \| Contents |
|---|---|---|---|---|---|---|---|
| 11 5001 107 | • 12,0 DIN | 25 | 6 | 70 | A | ZYA | 1× Zylinder ohne Stirnverzahnung<br>Cylinder without end cut |
| 11 5011 103 | • 12,0 DIN | 25 | 6 | 70 | B | ZYB | 1× Zylinder mit Stirnverzahnung<br>Cylinder with end cut |
| 11 5021 107 | • 12,0 DIN | 25 | 6 | 70 | C | WRC | 1× Walzenrundform<br>Ball nosed cylinder |
| 11 5031083 | • 12,0 DIN | 11,4 | 6 | 65 | D | KUD | 1× Kugel<br>Ball |
| 11 5041 037 | • 12,0 DIN | 22 | 6 | 66 | E | TRE | 1× Tropfen<br>Oval |
| 11 5051 053 | • 12,0 DIN | 25 | 6 | 70 | F | RBF | 1× Rundbogen<br>Ball nosed tree |
| 11 5061 063 | • 12,0 DIN | 25 | 6 | 70 | G | SPG | 1× Spitzbogen<br>Tree |
| 11 5071 027 | • 12,0 DIN | 32 | 6 | 70 | H | – | 1× Flamme<br>Flame |
| 11 5081 047 | • 12,0 DIN | 32 | 6 | 70 | L | KEL | 1× Rundkegel<br>Ball nosed cone |
| 11 5091 047 | • 12,0 DIN | 25 | 6 | 70 | M | SKM | 1× Spitzkegel<br>Cone |

## 11 4911 U

BEST SELLER

€ 184,35

DIN



BEST SELLER Bestseller – preisreduziert
Bestseller – price reduced

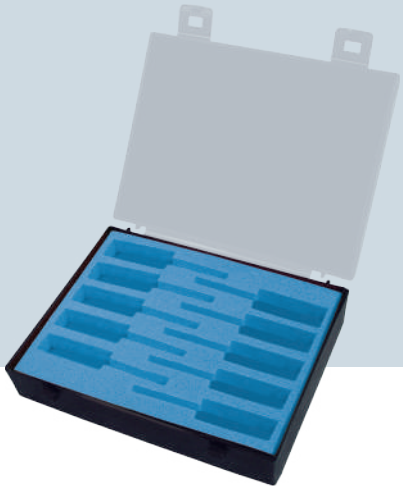
| Art. | d1 | l2 | d2 | l1 |
|---|---|---|---|---|
| 11 3001 107 | • 12,0 DIN | 25 | 6 | 70 |
| 11 3011 103 | • 12,0 DIN | 25 | 6 | 70 |
| 11 3021 107 | • 12,0 DIN | 25 | 6 | 70 |
| 11 3031 083 | • 12,0 DIN | 11,4 | 6 | 65 |
| 11 3041 037 | • 12,0 DIN | 22 | 6 | 66 |
| 11 3051 053 | • 12,0 DIN | 25 | 6 | 70 |
| 11 3061 063 | • 12,0 DIN | 25 | 6 | 70 |
| 11 3071 027 | • 12,0 DIN | 32 | 6 | 70 |
| 11 3081 047 | • 12,0 DIN | 32 | 6 | 70 |
| 11 3091 047 | • 12,0 DIN | 25 | 6 | 70 |



## 11 4950

Leeres Set / Empty set

€ 9,50



**Sie wollen einen anderen Inhalt? Kein Problem!** Wählen Sie aus unserem Gesamtsortiment 6 mm Schäfte aus. Beachten Sie dabei die maximale Länge von 86 mm.

**Would you like a display of mini-burrs? No problem!** Select 6.0 mm shafts from the complete list of products. Note that the maximum length is 86 mm.

## 11 4960

BEST SELLER

€ 863,50




Abschließbares Display Ø 6, 8, 10, 12 mm, Schaft 6 mm (40 Stück)

Lockable display Ø 6, 8, 10, 12 mm, shank 6 mm (40 pieces)

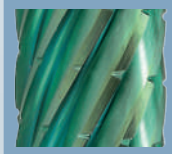
Film
Movie

BEST SELLER Bestseller – preisreduziert
Bestseller – price reduced

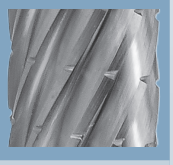
GREENTEC BESCHICHTET COATED

| Art. | d1 | l2 | d2 | l1 |
|---|---|---|---|---|
| 11 6091 051 | • 6 | 18 | 6 | 50 |
| 11 6091 076 | • 8 | 20 | 6 | 65 |
| 11 6091 086 | • 10 | 20 | 6 | 65 |
| 11 6091 104 | • 12 | 25 | 6 | 70 |
| 11 6092 054 | • 6 | 18 | 6 | 50 |
| 11 6092 076 | • 8 | 20 | 6 | 65 |
| 11 6092 086 | • 10 | 20 | 6 | 65 |
| 11 6092 108 | • 12 | 25 | 6 | 70 |
| 11 6095 031 | • 6 | 18 | 6 | 50 |
| 11 6095 036 | • 8 | 20 | 6 | 65 |
| 11 6095 041 | • 10 | 20 | 6 | 65 |
| 11 6095 054 | • 12 | 25 | 6 | 70 |
| 11 6096 036 | • 6 | 18 | 6 | 50 |
| 11 6096 041 | • 8 | 20 | 6 | 65 |
| 11 6096 046 | • 10 | 20 | 6 | 65 |
| 11 6096 064 | • 12 | 25 | 6 | 70 |
| 11 6098 021 | • 6 | 18 | 6 | 50 |
| 11 6098 026 | • 8 | 25 | 6 | 50 |
| 11 6098 031 | • 10 | 20 | 6 | 65 |
| 11 6098 048 | • 12 | 32 | 6 | 77 |

### HP-3 Pro Performance 82



Zahnung
Cut



| Form Shape | DIN 8033 | Inhalt \| Contents |
|---|---|---|
| B | ZYB | 2× Zylinder mit Stirnverzahnung<br>Cylinder with end cut |
| C | WRC | 2× Walzenrundform<br>Ball nosed cylinder |
| F | RBF | 2× Rundbogen<br>Ball nosed tree |
| G | SPG | 2× Spitzbogen<br>Tree |
| L | KEL | 2× Rundkegel<br>Ball nosed cone |

## 11 4960 U

BEST SELLER

€ 738,80




BEST SELLER Bestseller – preisreduziert
Bestseller – price reduced

| Art. | d1 | l2 | d2 | l1 |
|---|---|---|---|---|
| 11 4091 051 | • 6 | 18 | 6 | 50 |
| 11 4091 076 | • 8 | 20 | 6 | 65 |
| 11 4091 086 | • 10 | 20 | 6 | 65 |
| 11 4091 104 | • 12 | 25 | 6 | 70 |
| 11 4092 054 | • 6 | 18 | 6 | 50 |
| 11 4092 076 | • 8 | 20 | 6 | 65 |
| 11 4092 086 | • 10 | 20 | 6 | 65 |
| 11 4092 108 | • 12 | 25 | 6 | 70 |
| 11 4095 031 | • 6 | 18 | 6 | 50 |
| 11 4095 036 | • 8 | 20 | 6 | 65 |
| 11 4095 041 | • 10 | 20 | 6 | 65 |
| 11 4095 054 | • 12 | 25 | 6 | 70 |
| 11 4096 036 | • 6 | 18 | 6 | 50 |
| 11 4096 041 | • 8 | 20 | 6 | 65 |
| 11 4096 046 | • 10 | 20 | 6 | 65 |
| 11 4096 064 | • 12 | 25 | 6 | 70 |
| 11 4098 021 | • 6 | 18 | 6 | 50 |
| 11 4098 026 | • 8 | 25 | 6 | 50 |
| 11 4098 031 | • 10 | 20 | 6 | 65 |
| 11 4098 048 | • 12 | 32 | 6 | 77 |

## 11 4945

Leeres Display / Empty display

€ 71,45



**Sie wollen einen anderen Inhalt? Kein Problem!** Wählen Sie aus unserem Gesamtsortiment 6 mm Schäfte aus. Beachten Sie dabei die maximale Länge von 86 mm.

**Would you like a display of mini-burrs? No problem!** Select 6.0 mm shafts from the complete list of products. Note that the maximum length is 86 mm.

**11 4853** BEST SELLER € 714,48



Abschließbares Display Ø 6, 8, 10, 12 mm, Schaft 6 mm (40 Stück)

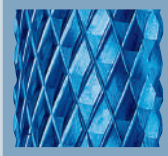
Lockable display Ø 6, 8, 10, 12 mm, shank 6 mm (40 pieces)

Film
Movie

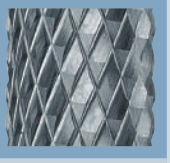
BEST SELLER Bestseller – preisreduziert
Bestseller – price reduced

BLUETEC BESCHICHTET COATED

**Universal HP-3**



Zahnung
Cut



| Art. | d1 | l2 | d2 | l1 |
|---|---|---|---|---|
| 11 5011 050 | • 6 | 18 | 6 | 50 |
| 11 5011 075 | • 8 | 20 | 6 | 65 |
| 11 5011 085 | • 10 | 20 | 6 | 65 |
| 11 5011 100 | • 12 | 25 | 6 | 70 |
| 11 5021 055 | • 6 | 18 | 6 | 50 |
| 11 5021 075 | • 8 | 20 | 6 | 65 |
| 11 5021 085 | • 10 | 20 | 6 | 65 |
| 11 5021 105 | • 12 | 25 | 6 | 70 |
| 11 5051 030 | • 6 | 18 | 6 | 50 |
| 11 5051 035 | • 8 | 20 | 6 | 65 |
| 11 5051 040 | • 10 | 20 | 6 | 65 |
| 11 5051 050 | • 12 | 25 | 6 | 70 |
| 11 5061 035 | • 6 | 18 | 6 | 50 |
| 11 5061 040 | • 8 | 20 | 6 | 65 |
| 11 5061 045 | • 10 | 20 | 6 | 65 |
| 11 5061 060 | • 12 | 25 | 6 | 70 |
| 11 5081 020 | • 6 | 18 | 6 | 50 |
| 11 5081 025 | • 8 | 25 | 6 | 50 |
| 11 5081 035 | • 10 | 30 | 6 | 75 |
| 11 5081 045 | • 12 | 32 | 6 | 77 |

| Form Shape | DIN 8033 | Inhalt \| Contents | |
|---|---|---|---|
| B | ZYB | 2× | Zylinder mit Stirnverzahnung<br>Cylinder with end cut |
| C | WRC | 2× | Walzenrundform<br>Ball nosed cylinder |
| F | RBF | 2× | Rundbogen<br>Ball nosed tree |
| G | SPG | 2× | Spitzbogen<br>Tree |
| L | KEL | 2× | Rundkegel<br>Ball nosed cone |

BEST SELLER € 608,38 **11 4853 U**

VALUETOOL € 468,18 neu new **11 4854 U**



BEST SELLER Bestseller – preisreduziert
Bestseller – price reduced

VALUETOOL

Valuetool – hervorragendes Preis-Leistungs-Verhältnis
Valuetool – excellent price-performance ratio

| Art. BESTSELLER | Art. VALUETOOL | d1 | l2 | d2 | l1 |
|---|---|---|---|---|---|
| 11 3011 050 | 11 3011 051 | • 6 | 18 | 6 | 50 |
| 11 3011 075 | 11 3011 076 | • 8 | 20 | 6 | 65 |
| 11 3011 085 | 11 3011 086 | • 10 | 20 | 6 | 65 |
| 11 3011 100 | 113011 104 | • 12 | 25 | 6 | 70 |
| 11 3021 055 | 11 3021 054 | • 6 | 18 | 6 | 50 |
| 11 3021 075 | 11 3021 076 | • 8 | 20 | 6 | 65 |
| 11 3021 085 | 11 3021 086 | • 10 | 20 | 6 | 65 |
| 11 3021 105 | 11 3021 108 | • 12 | 25 | 6 | 70 |
| 11 3051 030 | 11 3051 031 | • 6 | 18 | 6 | 50 |
| 11 3051 035 | 11 3051 036 | • 8 | 20 | 6 | 65 |
| 11 3051 040 | 11 3051 041 | • 10 | 20 | 6 | 65 |
| 11 3051 050 | 11 3051 054 | • 12 | 25 | 6 | 70 |
| 11 3061 035 | 11 3061 036 | • 6 | 18 | 6 | 50 |
| 11 3061 040 | 11 3061 041 | • 8 | 20 | 6 | 65 |
| 11 3061 045 | 11 3061 046 | • 10 | 20 | 6 | 65 |
| 11 3061 060 | 11 3061 064 | • 12 | 25 | 6 | 70 |
| 11 3081 020 | 11 3081 021 | • 6 | 18 | 6 | 50 |
| 11 3081 025 | 11 3081 026 | • 8 | 25 | 6 | 50 |
| 11 3081 035 | 11 3081 031 | • 10 | 30<br>20 | 6 | 75<br>65 |
| 11 3081 045 | 11 3081 048 | • 12 | 32<br>25 | 6 | 77<br>70 |

**Sie wollen einen anderen Inhalt? Kein Problem!** Wählen Sie aus unserem Gesamtsortiment 6 mm Schäfte aus. Beachten Sie dabei die maximale Länge von 86 mm.

**Would you like a display of mini-burrs? No problem!** Select 6.0 mm shafts from the complete list of products. Note that the maximum length is 86 mm.



**11 4945**

**Leeres Display / Empty display**

€ 71,45

## 11 4962

BEST SELLER

€ 1385,20




Abschließbares Display Ø 6, 8, 10, 12 mm, Schaft 6 mm (64 Stück)

Lockable display Ø 6, 8, 10, 12 mm, shank 6 mm (64 pieces)

Film
Movie

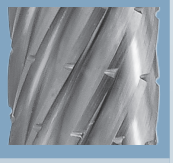
BEST SELLER Bestseller – preisreduziert
Bestseller – price reduced

GREENTEC BESCHICHTET COATED

## HP-3 Pro Performance 82



Zahnung
Cut



| Art. | d1 | l2 | d2 | l1 |
|---|---|---|---|---|
| 11 6090 066 | 6 | 18 | 6 | 50 |
| 11 6090 081 | 8 | 20 | 6 | 65 |
| 11 6090 091 | 10 | 20 | 6 | 65 |
| 11 6090 108 | 12 | 25 | 6 | 70 |
| 11 6091 051 | 6 | 18 | 6 | 50 |
| 11 6091 076 | 8 | 20 | 6 | 65 |
| 11 6091 086 | 10 | 20 | 6 | 65 |
| 11 6091 104 | 12 | 25 | 6 | 70 |
| 11 6092 054 | 6 | 18 | 6 | 50 |
| 11 6092 076 | 8 | 20 | 6 | 65 |
| 11 6092 086 | 10 | 20 | 6 | 65 |
| 11 6092 108 | 12 | 25 | 6 | 70 |
| 11 6094 021 | 6 | 10 | 6 | 50 |
| 11 6094 026 | 8 | 15 | 6 | 60 |
| 11 6094 031 | 10 | 16 | 6 | 60 |
| 11 6094 036 | 12 | 22 | 6 | 67 |
| 11 6095 031 | 6 | 18 | 6 | 50 |
| 11 6095 036 | 8 | 20 | 6 | 65 |
| 11 6095 041 | 10 | 20 | 6 | 65 |
| 11 6095 054 | 12 | 25 | 6 | 70 |
| 11 6096 036 | 6 | 18 | 6 | 50 |
| 11 6096 041 | 8 | 20 | 6 | 65 |
| 11 6096 046 | 10 | 20 | 6 | 65 |
| 11 6096 064 | 12 | 25 | 6 | 70 |
| 11 6097 011 | 6 | 14 | 6 | 50 |
| 11 6097 016 | 8 | 20 | 6 | 65 |
| 11 6097 021 | 10 | 20 | 6 | 65 |
| 11 6097 026 | 12 | 32 | 6 | 77 |
| 11 6098 021 | 6 | 18 | 6 | 50 |
| 11 6098 026 | 8 | 25 | 6 | 70 |
| 11 6098 031 | 10 | 20 | 6 | 65 |
| 11 6098 048 | 12 | 32 | 6 | 77 |

| Form Shape | DIN 8033 | Inhalt \| Contents |
|---|---|---|
| A | ZYA | 2× Zylinder ohne Stirnverzahnung<br>Cylinder without end cut |
| B | ZYB | 2× Zylinder mit Stirnverzahnung<br>Cylinder with end cut |
| C | WRC | 2× Walzenrundform<br>Ball nosed cylinder |
| E | TRE | 2× Tropfen<br>Oval |
| F | RBF | 2× Rundbogen<br>Ball nosed tree |
| G | SPG | 2× Spitzbogen<br>Tree |
| H | – | 2× Flamme<br>Flame |
| L | KEL | 2× Rundkegel<br>Ball nosed cone |

## 11 4962 U

BEST SELLER

€ 1185,30




BEST SELLER Bestseller – preisreduziert
Bestseller – price reduced

| Art. | d1 | l2 | d2 | l1 |
|---|---|---|---|---|
| 11 4090 066 | 6 | 18 | 6 | 50 |
| 11 4090 081 | 8 | 20 | 6 | 65 |
| 11 4090 091 | 10 | 20 | 6 | 65 |
| 11 4090 108 | 12 | 25 | 6 | 70 |
| 11 4091 051 | 6 | 18 | 6 | 50 |
| 11 4091 076 | 8 | 20 | 6 | 65 |
| 11 4091 086 | 10 | 20 | 6 | 65 |
| 11 4091 104 | 12 | 25 | 6 | 70 |
| 11 4092 054 | 6 | 18 | 6 | 50 |
| 11 4092 076 | 8 | 20 | 6 | 65 |
| 11 4092 086 | 10 | 20 | 6 | 65 |
| 11 4092 108 | 12 | 25 | 6 | 70 |
| 11 4094 021 | 6 | 10 | 6 | 50 |
| 11 4094 026 | 8 | 15 | 6 | 60 |
| 11 4094 031 | 10 | 16 | 6 | 60 |
| 11 4094 036 | 12 | 22 | 6 | 67 |
| 11 4095 031 | 6 | 18 | 6 | 50 |
| 11 4095 036 | 8 | 20 | 6 | 65 |
| 11 4095 041 | 10 | 20 | 6 | 65 |
| 11 4095 054 | 12 | 25 | 6 | 70 |
| 11 4096 036 | 6 | 18 | 6 | 50 |
| 11 4096 041 | 8 | 20 | 6 | 65 |
| 11 4096 046 | 10 | 20 | 6 | 65 |
| 11 4096 064 | 12 | 25 | 6 | 70 |
| 11 4097 011 | 6 | 14 | 6 | 50 |
| 11 4097 016 | 8 | 20 | 6 | 65 |
| 11 4097 021 | 10 | 20 | 6 | 65 |
| 11 4097 026 | 12 | 32 | 6 | 77 |
| 11 4098 021 | 6 | 18 | 6 | 50 |
| 11 4098 026 | 8 | 25 | 6 | 70 |
| 11 4098 031 | 10 | 20 | 6 | 65 |
| 11 4098 048 | 12 | 32 | 6 | 77 |

## 11 4955

Leeres Display / Empty display

% € 38,92



## 11 4948

Leeres Display / Empty display

€ 81,65



**Sie wollen einen anderen Inhalt? Kein Problem!**
Wählen Sie aus unserem Gesamtsortiment 6 mm Schäfte aus. Beachten Sie dabei die maximale Länge von 86 mm.

**Would you like a display of mini-burrs? No problem!**
Select 6.0 mm shafts from the complete list of products. Note that the maximum length is 86 mm.

## 11 4855

BEST SELLER

€ 1153,88



Abschließbares Display Ø 6, 8, 10, 12 mm, Schaft 6 mm (64 Stück)

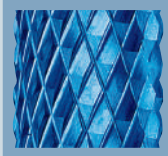
Lockable display Ø 6, 8, 10, 12 mm, shank 6 mm (64 pieces)

Film
Movie

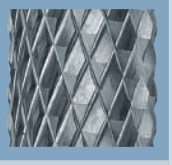
BEST SELLER Bestseller – preisreduziert
Bestseller – price reduced

BLUETEC BESCHICHTET COATED

## Universal HP-3



Zahnung
Cut



| Art. | d1 | l2 | d2 | l1 |
|---|---|---|---|---|
| 11 5001 065 | • 6 | 18 | 6 | 50 |
| 11 5001 080 | • 8 | 20 | 6 | 65 |
| 11 5001 090 | • 10 | 20 | 6 | 65 |
| 11 5001 105 | • 12 | 25 | 6 | 70 |
| 11 5011 050 | • 6 | 18 | 6 | 50 |
| 11 5011 075 | • 8 | 20 | 6 | 65 |
| 11 5011 085 | • 10 | 20 | 6 | 65 |
| 11 5011 100 | • 12 | 25 | 6 | 70 |
| 11 5021 055 | • 6 | 18 | 6 | 50 |
| 11 5021 075 | • 8 | 20 | 6 | 65 |
| 11 5021 085 | • 10 | 20 | 6 | 65 |
| 11 5021 105 | • 12 | 25 | 6 | 70 |
| 11 5041 020 | • 6 | 10 | 6 | 50 |
| 11 5041 025 | • 8 | 15 | 6 | 60 |
| 11 5041 030 | • 10 | 16 | 6 | 60 |
| 11 5041 035 | • 12 | 22 | 6 | 67 |
| 11 5051 030 | • 6 | 18 | 6 | 50 |
| 11 5051 035 | • 8 | 20 | 6 | 65 |
| 11 5051 040 | • 10 | 20 | 6 | 65 |
| 11 5051 050 | • 12 | 25 | 6 | 70 |
| 11 5061 035 | • 6 | 18 | 6 | 50 |
| 11 5061 040 | • 8 | 20 | 6 | 65 |
| 11 5061 045 | • 10 | 20 | 6 | 65 |
| 11 5061 060 | • 12 | 25 | 6 | 70 |
| 11 5071 010 | • 6 | 14 | 6 | 50 |
| 11 5071 015 | • 8 | 20 | 6 | 65 |
| 11 5071 020 | • 10 | 20 | 6 | 65 |
| 11 5071 025 | • 12 | 32 | 6 | 77 |
| 11 5081 020 | • 6 | 18 | 6 | 50 |
| 11 5081 025 | • 8 | 25 | 6 | 70 |
| 11 5081 035 | • 10 | 30 | 6 | 75 |
| 11 5081 045 | • 12 | 32 | 6 | 77 |

| Form Shape | DIN 8033 | Inhalt \| Contents |
|---|---|---|
| A | ZYA | 2× Zylinder ohne Stirnverzahnung<br>Cylinder without end cut |
| B | ZYB | 2× Zylinder mit Stirnverzahnung<br>Cylinder with end cut |
| C | WRC | 2× Walzenrundform<br>Ball nosed cylinder |
| E | TRE | 2× Tropfen<br>Oval |
| F | RBF | 2× Rundbogen<br>Ball nosed tree |
| G | SPG | 2× Spitzbogen<br>Tree |
| H | – | 2× Flamme<br>Flame |
| L | KEL | 2× Rundkegel<br>Ball nosed cone |

## 11 4855 U

BEST SELLER

€ 983,88

## 11 4856 U

VALUETOOL

€ 726,68

neu new



BEST SELLER Bestseller – preisreduziert
Bestseller – price reduced

VALUETOOL

Valuetool – hervorragendes Preis-Leistungs-Verhältnis
Valuetool – excellent price-performance ratio

| Art. BESTSELLER | Art. VALUETOOL | d1 | l2 | d2 | l1 |
|---|---|---|---|---|---|
| 11 3001 065 | 11 3001 066 | • 6 | 18 | 6 | 50 |
| 11 3001 080 | 11 3001 081 | • 8 | 20 | 6 | 65 |
| 11 3001 090 | 11 3001 091 | • 10 | 20 | 6 | 65 |
| 11 3001 105 | 11 3001 108 | • 12 | 25 | 6 | 70 |
| 11 3011 050 | 11 3011 051 | • 6 | 18 | 6 | 50 |
| 11 3011 075 | 11 3011 076 | • 8 | 20 | 6 | 65 |
| 11 3011 085 | 11 3011 086 | • 10 | 20 | 6 | 65 |
| 11 3011 100 | 11 3011 104 | • 12 | 25 | 6 | 70 |
| 11 3021 055 | 11 3021 054 | • 6 | 18 | 6 | 50 |
| 11 3021 075 | 11 3021 076 | • 8 | 20 | 6 | 65 |
| 11 3021 085 | 11 3021 086 | • 10 | 20 | 6 | 65 |
| 11 3021 105 | 11 3021 108 | • 12 | 25 | 6 | 70 |
| 11 3041 020 | 11 3041 021 | • 6 | 10 | 6 | 50 |
| 11 3041 025 | 11 3041 026 | • 8 | 15 | 6 | 60 |
| 11 3041 030 | 11 3041 031 | • 10 | 16 | 6 | 60 |
| 11 3041 035 | 11 3041 036 | • 12 | 22<br>21 | 6 | 67<br>66 |
| 11 3051 030 | 11 3051 031 | • 6 | 18 | 6 | 50 |
| 11 3051 035 | 11 3051 036 | • 8 | 20 | 6 | 65 |
| 11 3051 040 | 11 3051 041 | • 10 | 20 | 6 | 65 |
| 11 3051 050 | 11 3051 054 | • 12 | 25 | 6 | 70 |
| 11 3061 035 | 11 3061 036 | • 6 | 18 | 6 | 50 |
| 11 3061 040 | 11 3061 041 | • 8 | 20 | 6 | 65 |
| 11 3061 045 | 11 3061 046 | • 10 | 20 | 6 | 65 |
| 11 3061 060 | 11 3061 064 | • 12 | 25 | 6 | 70 |
| 11 3071 010 | 11 3071 011 | • 6 | 14 | 6 | 50 |
| 11 3071 015 | 11 3071 016 | • 8 | 20 | 6 | 65 |
| 11 3071 020 | 11 3071 021 | • 10 | 20 | 6 | 65 |
| 11 3071 025 | 11 3071 026 | • 12 | 32<br>30 | 6 | 77<br>75 |
| 11 3081 020 | 11 3081 021 | • 6 | 18 | 6 | 50 |
| 11 3081 025 | 11 3081 026 | • 8 | 25 | 6 | 70 |
| 11 3081 035 | 11 3081 031 | • 10 | 30<br>20 | 6 | 75<br>65 |
| 11 3081 045 | 11 3081 048 | • 12 | 32<br>25 | 6 | 77<br>70 |

**Sie wollen einen anderen Inhalt? Kein Problem!**
Wählen Sie aus unserem Gesamtsortiment 6 mm Schäfte aus. Beachten Sie dabei die maximale Länge von 86 mm.

**Would you like a display of mini-burrs? No problem!**
Select 6.0 mm shafts from the complete list of products. Note that the maximum length is 86 mm.



## 11 4948

Leeres Display / Empty display

€ 81,65



## 11 4955

Leeres Display / Empty display

% € 38,92

% 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

# FRÄSSTIFT-SETS Ø 3 MM, SCHAFT 3 MM
# BURR SETS Ø 3 MM, SHANK 3 MM

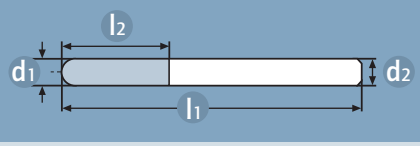
**11 4904** BEST SELLER € 76,40



10 Stück

10 pieces

Film
Movie



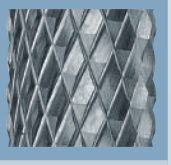

BEST SELLER Bestseller – preisreduziert
Bestseller – price reduced

BLUETEC BESCHICHTET COATED

## Universal HP-3



Zahnung
Cut



| Art. | d1 | l2 | d2 | l1 | Form Shape | DIN 8033 | Inhalt \| Contents |
|---|---|---|---|---|---|---|---|
| 11 5001 030 | • 3 | 14 | 3 | 38 | A | ZYA | 1× Zylinder ohne Stirnverzahnung<br>Cylinder without end cut |
| 11 5011 015 | • 3 | 14 | 3 | 38 | B | ZYB | 1× Zylinder mit Stirnverzahnung<br>Cylinder with end cut |
| 11 5021 025 | • 3 | 14 | 3 | 38 | C | WRC | 1× Walzenrundform<br>Ball nosed cylinder |
| 11 5031 025 | • 3 | 2,7 | 3 | 38 | D | KUD | 1× Kugel<br>Ball |
| 11 5041 010 | • 3 | 6 | 3 | 38 | E | TRE | 1× Tropfen<br>Oval |
| 11 5051 015 | • 3 | 14 | 3 | 38 | F | RBF | 1× Rundbogen<br>Ball nosed tree |
| 11 5061 015 | • 3 | 14 | 3 | 38 | G | SPG | 1× Spitzbogen<br>Tree |
| 11 5071 005 | • 3 | 6 | 3 | 38 | H | – | 1× Flamme<br>Flame |
| 11 5081 010 | • 3 | 14 | 3 | 38 | L | KEL | 1× Rundkegel<br>Ball nosed cone |
| 11 5091 015 | • 3 | 11 | 3 | 38 | M | SKM | 1× Spitzkegel<br>Cone |

**11 4904 U**

BEST SELLER € 58,45

VALUETOOL € 40,45 neu new **11 4903 U**



BEST SELLER Bestseller – preisreduziert
Bestseller – price reduced

VALUETOOL

Valuetool – hervorragendes Preis-Leistungs-Verhältnis
Valuetool – excellent price-performance ratio

| Art. BESTSELLER | Art. VALUETOOL | d1 | l2 | d2 | l1 |
|---|---|---|---|---|---|
| 11 3001 030 | 11 3001 031 | • 3 | 14 | 3 | 38 |
| 11 3011 015 | 11 3011 016 | • 3 | 14 | 3 | 38 |
| 11 3021 025 | 11 3021 026 | • 3 | 14 | 3 | 38 |
| 11 3031 025 | 11 3031 026 | • 3 | 2,7<br>2,5 | 3 | 38 |
| 11 3041 010 | 11 3041 009 | • 3 | 6 | 3 | 38 |
| 11 3051 015 | 11 3051 016 | • 3 | 14 | 3 | 38 |
| 11 3061 015 | 11 3061 016 | • 3 | 14 | 3 | 38 |
| 11 3071 005 | 11 3071 004 | • 3 | 6 | 3 | 38 |
| 11 3081 010 | 11 3081 008 | • 3 | 14 | 3 | 38 |
| 11 3091 015 | 11 3091 016 | • 3 | 11 | 3 | 38 |

**11 4952**

Leeres Set /
Empty set

€ 0,65



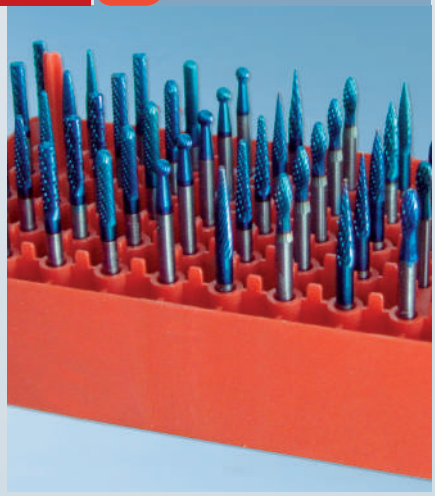
**Sie wollen einen anderen Inhalt? Kein Problem!** Wählen Sie aus unserem Gesamtsortiment 3 mm Schäfte aus. Beachten Sie dabei die maximale Länge von 38 mm.

**Would you like a display of mini-burrs? No problem!** Select 3.0 mm shafts from the complete list of products. Note that the maximum length is 38 mm.



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

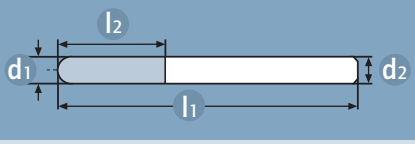
**11 4837** BEST SELLER € 381,05



50 Stück

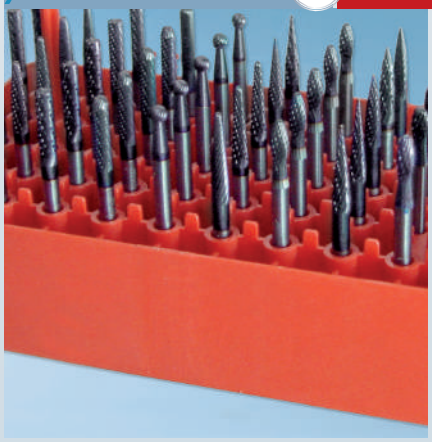
50 pieces

Film
Movie




BEST SELLER € 291,30 **11 4837 U**

VALUETOOL € 201,30 neu new **11 4838 U**



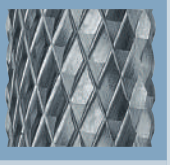
BEST SELLER Bestseller – preisreduziert
Bestseller – price reduced

BLUETEC BESCHICHTET COATED

## Universal HP-3



Zahnung
Cut



BEST SELLER Bestseller – preisreduziert
Bestseller – price reduced

VALUETOOL

Valuetool – hervorragendes Preis-Leistungs-Verhältnis
Valuetool – excellent price-performance ratio

| Art. | d1 | l2 | d2 | l1 | Form Shape | DIN 8033 | Inhalt \| Contents |
|---|---|---|---|---|---|---|---|
| 11 5001 030 | • 3 | 14 | 3 | 38 | A | ZYA | 5× Zylinder ohne Stirnverzahnung<br>Cylinder without end cut |
| 11 5011 015 | • 3 | 14 | 3 | 38 | B | ZYB | 5× Zylinder mit Stirnverzahnung<br>Cylinder with end cut |
| 11 5021 025 | • 3 | 14 | 3 | 38 | C | WRC | 5× Walzenrundform<br>Ball nosed cylinder |
| 11 5031 025 | • 3 | 2,7 | 3 | 38 | D | KUD | 5× Kugel<br>Ball |
| 11 5041 010 | • 3 | 6 | 3 | 38 | E | TRE | 5× Tropfen<br>Oval |
| 11 5051 015 | • 3 | 14 | 3 | 38 | F | RBF | 5× Rundbogen<br>Ball nosed tree |
| 11 5061 015 | • 3 | 14 | 3 | 38 | G | SPG | 5× Spitzbogen<br>Tree |
| 11 5071 005 | • 3 | 6 | 3 | 38 | H | – | 5× Flamme<br>Flame |
| 11 5081 010 | • 3 | 14 | 3 | 38 | L | KEL | 5× Rundkegel<br>Ball nosed cone |
| 11 5091 015 | • 3 | 11 | 3 | 38 | M | SKM | 5× Spitzkegel<br>Cone |

| Art. BESTSELLER | Art. VALUETOOL | d1 | l2 | d2 | l1 |
|---|---|---|---|---|---|
| 11 3001 030 | 11 3001 031 | • 3 | 14 | 3 | 38 |
| 11 3011 015 | 11 3011 016 | • 3 | 14 | 3 | 38 |
| 11 3021 025 | 11 3021 026 | • 3 | 14 | 3 | 38 |
| 11 3031 025 | 11 3031 026 | • 3 | 2,7<br>2,5 | 3 | 38 |
| 11 3041 010 | 11 3041 009 | • 3 | 6 | 3 | 38 |
| 11 3051 015 | 11 3051 016 | • 3 | 14 | 3 | 38 |
| 11 3061 015 | 11 3061 016 | • 3 | 14 | 3 | 38 |
| 11 3071 005 | 11 3071 004 | • 3 | 6 | 3 | 38 |
| 11 3081 010 | 11 3081 008 | • 3 | 14 | 3 | 38 |
| 11 3091 015 | 11 3091 016 | • 3 | 11 | 3 | 38 |

**Sie wollen einen anderen Inhalt? Kein Problem!** Wählen Sie aus unserem Gesamtsortiment 3 mm Schäfte aus. Beachten Sie dabei die maximale Länge von 38 mm.

**Would you like a display of mini-burrs? No problem!** Select 3.0 mm shafts from the complete list of products. Note that the maximum length is 38 mm.



**11 4953**
Leeres Set / Empty set
€ 2,05

## Aluminium Positiv
## Aluminum positive

**11 1000**

VALUETOOL – hervorragendes Preis-Leistungs-Verhältnis / excellent price-performance ratio

| Art. | | | H7 | | | | | € |
|---|---|---|---|---|---|---|---|---|
| 11 1000 200 010 | ● | 200 | 3,2/2,5 | 30 | 54 TFP | UNI 1 + UNI 2 | - | - | 74,55 |
| 11 1000 200 020 | ● | 200 | 2,8/2,2 | 30 | 72 TFP | UNI 1 + UNI 2 | - | - | 87,85 |
| 11 1000 225 010 | ● | 225 | 2,5/1,8 | 30 | 68 TFP | UNI 1 + UNI 2 | - | - | 83,10 |
| 11 1000 250 010 | ● | 250 | 3,2/2,5 | 30 | 60 TFP | UNI 1 + UNI 2 | ✔ | - | 82,05 |
| 11 1000 250 015 NEW | ● | 250 | 3,2/2,5 | 30 | 60 TFP | UNI 1 + UNI 2 | ✔ | - | 52,95 |
| 11 1000 250 017 NEW | ● | 250 | 3,2/2,5 | 30 | 80 TFP | UNI 1 + UNI 2 | ✔ | - | 60,50 |
| 11 1000 250 020 | ● | 250 | 3,2/2,5 | 30 | 80 TFP | UNI 1 + UNI 2 | ✔ | - | 90,40 |
| 11 1000 250 030 | ● | 250 | 3,2/2,5 | 32 | 80 TFP | UNI 2 | ✔ | - | 91,95 |
| 11 1000 275 010 | ● | 275 | 3,2/2,5 | 40 | 72 TFP | 2-9-55+4-12-64 | ✔ | - | 98,30 |
| 11 1000 280 010 | ● | 280 | 3,2/2,5 | 30 | 68 TFP | UNI 1 + UNI 2 | ✔ | - | 99,20 |
| 11 1000 280 020 | ● | 280 | 3,2/2,5 | 30 | 96 TFP | UNI 1 + UNI 2 | ✔ | - | 104,10 |
| 11 1000 300 010 | ● | 300 | 3,2/2,5 | 30 | 72 TFP | UNI 1 + UNI 2 | ✔ | - | 99,20 |
| 11 1000 300 015 NEW | ● | 300 | 3,2/2,5 | 30 | 72 TFP | UNI 1 + UNI 2 | ✔ | - | 61,20 |
| 11 1000 300 017 NEW | ● | 300 | 3,2/2,5 | 30 | 96 TFP | UNI 1 + UNI 2 | ✔ | - | 71,10 |
| 11 1000 300 020 | ● | 300 | 3,2/2,5 | 30 | 96 TFP | UNI 1 + UNI 2 | ✔ | - | 99,80 |
| 11 1000 300 030 | ● | 300 | 3,2/2,5 | 32 | 72 TFP | UNI 2 | ✔ | - | 99,20 |
| 11 1000 300 040 | ● | 300 | 3,2/2,5 | 32 | 96 TFP | UNI 2 | ✔ | - | 104,10 |
| 11 1000 300 050 | ● | 300 | 3,2/2,5 | 40 | 96 TFP | 2-9-55+4-12-64 | ✔ | - | 119,40 |
| 11 1000 320 010 | ● | 320 | 3,2/2,5 | 30 | 84 TFP | UNI 1 + UNI 2 | ✔ | - | 116,10 |
| 11 1000 330 010 | ● | 330 | 3,2/2,5 | 32/30 | 72 TFP | UNI 2 | ✔ | - | 106,15 |
| 11 1000 330 020 | ● | 330 | 3,2/2,5 | 32/30 | 96 TFP | UNI 2 | ✔ | - | 128,70 |
| 11 1000 350 020 | ● | 350 | 3,4/2,8 | 30 | 72 TFP | UNI 1 + UNI 2 | ✔ | - | 112,00 |
| 11 1000 350 025 NEW | ● | 350 | 3,6/2,8 | 30 | 84 TFP | UNI 1 + UNI 2 | ✔ | - | 75,70 |
| 11 1000 350 030 | ● | 350 | 3,4/2,8 | 30 | 92 TFP | UNI 1 + UNI 2 | ✔ | - | 129,65 |
| 11 1000 350 040 | ● | 350 | 3,4/2,8 | 30 | 108 TFP | UNI 1 + UNI 2 | ✔ | - | 144,15 |
| 11 1000 350 045 NEW | ● | 350 | 3,6/2,8 | 30 | 108 TFP | UNI 1 + UNI 2 | ✔ | - | 85,15 |
| 11 1000 350 050 | ● | 350 | 3,4/2,8 | 32 | 92 TFP | UNI 2 | ✔ | - | 129,65 |
| 11 1000 350 060 | ● | 350 | 3,4/2,8 | 32 | 108 TFP | UNI 2 | ✔ | - | 137,00 |
| 11 1000 350 070 | ● | 350 | 3,4/2,8 | 40 | 92 TFP | 2-9-55+4-12-64 | ✔ | - | 129,65 |
| 11 1000 350 080 | ● | 350 | 3,4/2,8 | 40 | 108 TFP | 2-9-55+4-12-64 | ✔ | - | 144,15 |
| 11 1000 370 010 | ● | 370 | 3,6/3,0 | 30 | 96 TFP | UNI 1 + UNI 2 | ✔ | - | 149,90 |
| 11 1000 400 010 | ● | 400 | 3,8/3,2 | 30 | 72 TFP | UNI 1 + UNI 2 | ✔ | ✔ | 153,40 |
| 11 1000 400 020 | ● | 400 | 3,8/3,2 | 30 | 96 TFP | UNI 1 + UNI 2 | ✔ | ✔ | 176,50 |
| 11 1000 400 025 NEW | ● | 400 | 3,6/2,8 | 30 | 96 TFP | UNI 1 + UNI 2 | ✔ | ✔ | 85,15 |
| 11 1000 400 030 | ● | 400 | 3,8/3,2 | 30 | 120 TFP | UNI 1 + UNI 2 | ✔ | ✔ | 199,65 |
| 11 1000 400 040 | ● | 400 | 3,8/3,2 | 32 | 96 TFP | UNI 2 | ✔ | ✔ | 170,00 |
| 11 1000 400 050 | ● | 400 | 3,8/3,2 | 40 | 96 TFP | 4-12-64+2-15-80 | ✔ | ✔ | 176,50 |
| 11 1000 400 060 | ● | 400 | 3,8/3,2 | 40 | 120 TFP | 4-12-64+2-15-80 | ✔ | ✔ | 199,65 |
| 11 1000 400 070 | ● | 400 | 3,8/3,2 | 50 | 96 TFP | 4-15-80 | ✔ | ✔ | 176,50 |
| 11 1000 400 080 | ● | 400 | 3,8/3,2 | 50 | 120 TFP | 4-15-80 | ✔ | ✔ | 199,65 |
| 11 1000 420 010 | ● | 420 | 4,0/3,2 | 30 | 72 TFP | | ✔ | ✔ | 168,20 |
| 11 1000 420 020 | ● | 420 | 4,0/3,2 | 30 | 96 TFP | 2-9-46,4 + UNI 2 | ✔ | ✔ | 177,90 |
| 11 1000 420 030 | ● | 420 | 4,0/3,2 | 30 | 120 TFP | + 2-10,5-70 | ✔ | ✔ | 199,60 |
| 11 1000 430 010 | % | 430 | 4,0/3,2 | 30 | 96 TFP | | ✔ | ✔ | 69,14 |
| 11 1000 450 010 | ● | 450 | 4,0/3,2 | 30 | 72 TFP | UNI 1 + UNI 2 + 2-10,5-70 | ✔ | ✔ | 171,40 |
| 11 1000 450 020 | ● | 450 | 4,0/3,2 | 30 | 108 TFP | UNI 1 + UNI 2 + 2-10,5-70 | ✔ | ✔ | 187,95 |
| 11 1000 450 025 NEW | ● | 450 | 4,0/3,2 | 30 | 108 TFP | UNI 1 + UNI 2 | ✔ | ✔ | 103,55 |
| 11 1000 450 030 | ● | 450 | 4,0/3,2 | 30 | 120 TFP | UNI 1 + UNI 2 + 2-10,5-70 | ✔ | ✔ | 206,35 |
| 11 1000 450 040 | ● | 450 | 4,0/3,2 | 32 | 96 TFP | UNI 2 | ✔ | ✔ | 179,55 |
| 11 1000 450 050 | ● | 450 | 4,0/3,2 | 32 | 120 TFP | UNI 2 | ✔ | ✔ | 206,35 |
| 11 1000 500 010 | ● | 500 | 4,2/3,6 | 30 | 72 TFP | 2-9-46,4 + UNI 2 + 2-10,5-70 | ✔ | ✔ | 181,20 |
| 11 1000 500 020 | ● | 500 | 4,2/3,6 | 30 | 96 TFP | 2-9-46,4 + UNI 2 + 2-10,5-70 | ✔ | ✔ | 203,60 |
| 11 1000 500 030 | ● | 500 | 4,2/3,6 | 30 | 120 TFP | 2-9-46,4 + UNI 2 + 2-10,5-70 | ✔ | ✔ | 229,55 |
| 11 1000 500 035 NEW | ● | 500 | 4,0/3,2 | 30 | 120 TFP | UNI 1 + UNI 2 | ✔ | ✔ | 120,80 |
| 11 1000 500 040 | ● | 500 | 4,2/3,6 | 30 | 144 TFP | 2-9-46,4 + UNI 2 + 2-10,5-70 | ✔ | ✔ | 258,45 |
| 11 1000 500 050 | ● | 500 | 4,2/3,6 | 32 | 120 TFP | UNI 2 | ✔ | ✔ | 229,55 |
| 11 1000 500 060 | ● | 500 | 4,2/3,6 | 32 | 144 TFP | UNI 2 | ✔ | ✔ | 258,45 |
| 11 1000 550 010 | ● | 550 | 4,4/3,8 | 30 | 72 TFP | | ✔ | ✔ | 282,20 |
| 11 1000 550 020 | ● | 550 | 4,4/3,8 | 30 | 110 TFP | 2-9-46,4 + UNI 2 | ✔ | ✔ | 313,70 |
| 11 1000 550 030 | ● | 550 | 4,4/3,8 | 30 | 144 TFP | + 2-10,5-70 | ✔ | ✔ | 374,10 |
| 11 1000 550 040 | ● | 550 | 4,4/3,8 | 32 | 96 TFP | UNI 2 | ✔ | ✔ | 291,60 |
| 11 1000 550 050 | ● | 550 | 4,4/3,8 | 32 | 128 TFP | UNI 2 | ✔ | ✔ | 330,95 |
| 11 1000 550 060 | ● | 550 | 4,4/3,8 | 80 | 128 TFP | 6-9-100 | ✔ | ✔ | 337,75 |
| 11 1000 600 010 | ● | 600 | 4,6/4,0 | 30 | 140 TFP | UNI 1 + UNI 2 | ✔ | ✔ | 420,20 |
| - | ○ | 1000 | - | - | - | - | bis ∅ 1000 mm auf Anfrage erhältlich<br>up to ∅ 1000 mm available on request | | |

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

UNI 1 = 2-7-42+2-9-46,4 UNI 2 = 2-10-60+2-11-63+2-12-64

Sie wünschen: Höhere Schnittwerte? Weniger Verschnitt? Weniger Verschleiß/Energieverbrauch der Maschine? Bei Handgeführten Maschinen sowie manuellem Vorschub wesentlich weniger Kraftaufwand? Siehe Aluminium Positiv Dünnschnitt. Artikel 11 1050 Seite 975.
You want: Higher cutting values? Less waste? Less wear/energy consumption of the machine? With hand-held machines and manual feed much less effort? See aluminum positive thin-cut. Type 11 1050 page 975.

## Aluminium Negativ
## Aluminum negative

**11 1100**

BEST SELLER Bestseller – preisreduziert · Bestseller – price reduced

VALUETOOL – hervorragendes Preis-Leistungs-Verhältnis / excellent price-performance ratio

| Art. | | | H7 | | | | | € |
|---|---|---|---|---|---|---|---|---|
| 11 1100 250 010 | ● 250 | 3,2/2,5 | 30 | 60 TFN | UNI 1 + UNI 2 | ✔ | - | 70,35 |
| 11 1100 250 015 NEW | ● 250 | 3,2/2,5 | 30 | 60 TFN | UNI 1 + UNI 2 | ✔ | - | 52,95 |
| 11 1100 250 017 NEW | ● 250 | 3,2/2,5 | 30 | 80 TFN | UNI 1 + UNI 2 | ✔ | - | 60,50 |
| 11 1100 250 020 | ● 250 | 3,2/2,5 | 30 | 80 TFN | UNI 1 + UNI 2 | ✔ | - | 70,95 |
| 11 1100 250 030 | ● 250 | 2,8/2,2 | 30 | 80 TFN | UNI 1 + UNI 2 | ✔ | - | 70,25 |
| 11 1100 250 040 | ● 250 | 2,8/2,2 | 30 | 100 TFN | UNI 1 + UNI 2 | ✔ | - | 84,45 |
| 11 1100 250 050 | ● 250 | 3,2/2,5 | 32 | 60 TFN | UNI 2 | ✔ | - | 70,10 |
| 11 1100 250 060 | ● 250 | 3,2/2,5 | 32 | 80 TFN | UNI 2 | ✔ | - | 78,80 |
| 11 1100 250 070 | ● 250 | 3,2/2,5 | 32 | 100 TFN | UNI 2 | ✔ | - | 102,50 |
| 11 1100 275 010 | ● 275 | 3,2/2,5 | 40 | 88 TFN | 2-9-55+4-12-64 | ✔ | - | 96,15 |
| 11 1100 275 020 | ● 275 | 3,2/2,5 | 40 | 110 TFN | 2-9-55+4-12-64 | ✔ | - | 120,80 |
| 11 1100 280 010 | ● 280 | 3,2/2,5 | 30 | 88 TFN | UNI 1 + UNI 2 | ✔ | - | 96,15 |
| 11 1100 300 010 | ● 300 | 3,2/2,5 | 30 | 72 TFN | UNI 1 + UNI 2 | ✔ | - | 85,05 |
| 11 1100 300 015 NEW | ● 300 | 3,2/2,5 | 30 | 72 TFN | UNI 1 + UNI 2 | ✔ | - | 61,20 |
| 11 1100 300 017 NEW | ● 300 | 3,2/2,5 | 30 | 96 TFN | UNI 1 + UNI 2 | ✔ | - | 71,10 |
| 11 1100 300 020 | ● 300 | 3,2/2,5 | 30 | 96 TFN | UNI 1 + UNI 2 | ✔ | - | 80,30 |
| 11 1100 300 030 | ● 300 | 2,8/2,2 | 30 | 120 TFN | UNI 1 + UNI 2 | ✔ | - | 117,75 |
| 11 1100 300 040 | ● 300 | 3,2/2,5 | 32 | 72 TFN | UNI 2 | ✔ | - | 85,05 |
| 11 1100 300 050 | ● 300 | 3,2/2,5 | 32 | 96 TFN | UNI 2 | ✔ | - | 93,60 |
| 11 1100 300 060 | ● 300 | 2,8/2,2 | 32 | 120 TFN | UNI 2 | ✔ | - | 117,75 |
| 11 1100 300 070 | ● 300 | 3,2/2,5 | 40 | 72 TFN | 2-9-55+4-12-64 | ✔ | - | 85,05 |
| 11 1100 300 080 | ● 300 | 3,2/2,5 | 40 | 96 TFN | 2-9-55+4-12-64 | ✔ | - | 102,35 |
| 11 1100 305 010 | ● 305 | 3,2/2,5 | 30 | 96 TFN | UNI 1 + UNI 2 | ✔ | - | 103,40 |
| 11 1100 330 010 | ● 330 | 3,2/2,5 | 30 | 72 TFN | UNI 1 + UNI 2 | ✔ | - | 94,35 |
| 11 1100 330 020 | ● 330 | 3,2/2,5 | 30 | 96 TFN | UNI 1 + UNI 2 | ✔ | - | 108,00 |
| 11 1100 330 030 | ● 330 | 2,8/2,2 | 30 | 120 TFN | UNI 1 + UNI 2 | ✔ | - | 127,20 |
| 11 1100 330 040 | % 330 | 3,2/2,5 | 32 | 72 TFN | UNI 2 | ✔ | - | 40,96 |
| 11 1100 330 050 | ● 330 | 3,2/2,5 | 32 | 96 TFN | UNI 2 | ✔ | - | 108,00 |
| 11 1100 330 060 | % 330 | 2,8/2,2 | 32 | 120 TFN | UNI 2 | ✔ | - | 55,26 |
| 11 1100 350 010 | ● 350 | 3,4/2,8 | 30 | 90 TFN | UNI 1 + UNI 2 | ✔ | - | 109,70 |
| 11 1100 350 015 NEW | ● 350 | 3,6/2,8 | 30 | 84 TFN | UNI 1 + UNI 2 | ✔ | - | 75,70 |
| 11 1100 350 017 NEW | ● 350 | 3,6/2,8 | 30 | 108 TFN | UNI 1 + UNI 2 | ✔ | - | 85,15 |
| 11 1100 350 020 | ● 350 | 3,4/2,8 | 30 | 108 TFN | UNI 1 + UNI 2 | ✔ | - | 108,00 |
| 11 1100 350 030 | ● 350 | 3,2/2,5 | 30 | 140 TFN | UNI 1 + UNI 2 | ✔ | - | 141,35 |
| 11 1100 350 040 | ● 350 | 3,4/2,8 | 32 | 90 TFN | UNI 2 | ✔ | - | 110,50 |
| 11 1100 350 050 | ● 350 | 3,4/2,8 | 32 | 108 TFN | UNI 2 | ✔ | - | 113,70 |
| 11 1100 350 060 | ● 350 | 3,4/2,8 | 40 | 84 TFN | 2-9-55+4-12-64 | ✔ | - | 104,65 |
| 11 1100 350 070 | ● 350 | 3,4/2,8 | 40 | 108 TFN | 2-9-55+4-12-64 | ✔ | - | 123,60 |
| 11 1100 350 080 | ● 350 | 3,4/2,8 | 50 | 84 TFN | 4-15-80 | ✔ | - | 104,65 |
| 11 1100 350 090 | ● 350 | 3,4/2,8 | 50 | 108 TFN | 4-15-80 | ✔ | - | 121,45 |
| 11 1100 370 010 | ● 370 | 3,6/3,0 | 30 | 90 TFN | UNI 1 + UNI 2 | ✔ | - | 131,00 |
| 11 1100 370 020 | ● 370 | 3,6/3,0 | 30 | 108 TFN | UNI 1 + UNI 2 | ✔ | - | 142,15 |
| 11 1100 380 010 | ● 380 | 3,8/3,2 | 32 | 90 TFN | UNI 2 | ✔ | - | 131,00 |
| 11 1100 380 020 | ● 380 | 3,8/3,2 | 32 | 110 TFN | UNI 2 | ✔ | - | 130,75 |
| 11 1100 380 030 | ● 380 | 3,8/3,2 | 32 | 132 TFN | UNI 2 | ✔ | - | 172,95 |
| 11 1100 400 010 | ● 400 | 3,8/3,2 | 30 | 96 TFN | UNI 1 + UNI 2 | ✔ | ✔ | 151,30 |
| 11 1100 400 015 NEW | ● 400 | 3,6/2,8 | 30 | 96 TFN | UNI 1 + UNI 2 | ✔ | ✔ | 85,15 |
| 11 1100 400 020 | ● 400 | 3,8/3,2 | 30 | 108 TFN | UNI 1 + UNI 2 | ✔ | ✔ | 163,90 |
| 11 1100 400 030 | ● 400 | 3,8/3,2 | 30 | 120 TFN | UNI 1 + UNI 2 | ✔ | ✔ | 171,15 |
| 11 1100 400 035 NEW | ● 400 | 3,6/2,8 | 30 | 120 TFN | UNI 1 + UNI 2 | ✔ | ✔ | 101,25 |
| 11 1100 400 040 | ● 400 | 3,8/3,2 | 32 | 96 TFN | UNI 2 | ✔ | ✔ | 140,70 |
| 11 1100 400 050 | ● 400 | 3,8/3,2 | 32 | 108 TFN | UNI 2 | ✔ | ✔ | 163,90 |
| 11 1100 400 060 | ● 400 | 3,8/3,2 | 32 | 120 TFN | UNI 2 | ✔ | ✔ | 171,15 |
| 11 1100 400 070 | ● 400 | 3,8/3,2 | 40 | 96 TFN | 4-12-64+2-15-80 | ✔ | ✔ | 151,30 |
| 11 1100 400 080 | ● 400 | 3,8/3,2 | 40 | 120 TFN | 4-12-64+2-15-80 | ✔ | ✔ | 171,15 |
| 11 1100 400 090 | ● 400 | 3,8/3,2 | 50 | 96 TFN | 4-15-80 | ✔ | ✔ | 151,30 |
| 11 1100 400 100 | ● 400 | 3,8/3,2 | 50 | 120 TFN | 4-15-80 | ✔ | ✔ | 171,15 |
| 11 1100 420 010 | ● 420 | 4,0/3,2 | 30 | 96 TFN | 2-9-46,4 + UNI 2 + 2-10,5-70 | ✔ | ✔ | 152,50 |
| 11 1100 420 015 NEW | ● 420 | 4,0/3,2 | 30 | 96 TFN | UNI 1 + UNI 2 | ✔ | ✔ | 100,30 |
| 11 1100 420 020 | ● 420 | 4,0/3,2 | 30 | 108 TFN | 2-9-46,4 + UNI 2 + 2-10,5-70 | ✔ | ✔ | 162,35 |
| 11 1100 420 030 | ● 420 | 4,0/3,2 | 30 | 120 TFN | 2-9-46,4 + UNI 2 + 2-10,5-70 | ✔ | ✔ | 160,25 |
| 11 1100 420 040 | ● 420 | 4,0/3,2 | 40 | 96 TFN | 4-12-64+2-15-80 | ✔ | ✔ | 141,80 |
| 11 1100 420 050 | ● 420 | 4,0/3,2 | 40 | 108 TFN | 4-12-64+2-15-80 | ✔ | ✔ | 162,35 |
| 11 1100 420 060 | ● 420 | 4,0/3,2 | 40 | 120 TFN | 4-12-64+2-15-80 | ✔ | ✔ | 172,30 |
| 11 1100 450 010 | ● 450 | 4,0/3,2 | 30 | 108 TFN | 2-9-46,4 + UNI 2 + 2-10,5-70 | ✔ | ✔ | 161,10 |
| 11 1100 450 015 NEW | ● 450 | 4,0/3,2 | 30 | 108 TFN | UNI 1 + UNI 2 | ✔ | ✔ | 103,55 |
| 11 1100 450 020 | ● 450 | 4,0/3,2 | 30 | 128 TFN | 2-9-46,4 + UNI 2 + 2-10,5-70 | ✔ | ✔ | 180,30 |
| 11 1100 500 010 | ● 500 | 4,2/3,6 | 30 | 120 TFN | 2-9-46,4 + UNI 2 + 2-10,5-70 | ✔ | ✔ | 186,90 |
| 11 1100 500 015 NEW | ● 500 | 4,0/3,2 | 30 | 120 TFN | UNI 1 + UNI 2 | ✔ | ✔ | 120,80 |
| 11 1100 500 020 | ● 500 | 4,2/3,6 | 30 | 140 TFN | 2-9-46,4 + UNI 2 + 2-10,5-70 | ✔ | ✔ | 215,40 |
| 11 1100 520 010 | ● 520 | 4,2/3,6 | 30 | 120 TFN | - | ✔ | ✔ | 263,55 |
| 11 1100 550 010 | ● 550 | 4,4/3,8 | 30 | 108 TFN | 2-9-46,4 + UNI 2 + 2-10,5-70 | ✔ | ✔ | 255,90 |
| 11 1100 550 020 | ● 550 | 4,4/3,8 | 30 | 132 TFN | | ✔ | ✔ | 286,60 |
| 11 1100 600 010 | ● 600 | 4,6/4,0 | 30 | 140 TFN | UNI 1 + UNI 2 | ✔ | ✔ | 360,15 |
| - | ○ 1000 | - | - | - | - | bis ∅ 1000 mm auf Anfrage erhältlich<br>up to ∅ 1000 mm available on request | | |

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

UNI 1 = 2-7-42 + 2-9-46,40 UNI 2 = 2-10-60 + 2-11-63 + 2-12-64

Sie wünschen: Höhere Schnittwerte? Weniger Verschnitt? Weniger Verschleiß/Energieverbrauch der Maschine? Bei Handgeführten Maschinen sowie manuellem Vorschub wesentlich weniger Kraftaufwand?
Siehe Aluminium Negativ Dünnschnitt. Artikel 11 1120 Seite 980
You want: Higher cutting values? Less waste? Less wear/energy consumption of the machine? With hand-held machines and manual feed much less effort?
See aluminum negative thin-cut. Article 11 1120 page 980

## MECUTOIL 100 PRO

25 l | € 266,05 | 60 1200 25

10 l | € 128,85 | 60 1200 10




25 l 10 l

### HOCHLEISTUNGS-KÜHLSCHMIER-KONZENTRAT. SILIKONFREI
### mit **geringem** Mineralölanteil

Dieses Produkt ist eine sehr sinnvolle Ergänzung für das Portfolio, wo bisher nur der Bereich der konventionellen Kühlung mit dem Mecutoil 100 abgedeckt war. Aufgrund der Schmierwirkung und des hohen Mineralölanteils des MECUTOIL 100 sollte bei einem Kühlmitteldruck >20 bar unser Mecutoil 100 PRO eingesetzt werden.

Mecutoil 100 PRO ist ein universeller, wassermischbarer Kühlschmierstoff mit einem Mineralölanteil von 20 % für die allgemeine Bearbeitung und für die innere Kühlmittelzufuhr (IKZ).
Vorwiegend für Kühlsysteme mit >20 bar Kühlmitteldruck wie das High Performance Cutting (HPC) bzw. die Hochdruckbearbeitung mit IKZ 80, aber auch für Kühlmittelsysteme mit <20 bar Kühlmitteldruck.
Ist in Wasser zu verrühren!

**Eigenschaften:**
- Wassermischbar
- Für High Performance Cutting (HPC), Hochdruckbearbeitung >20 bar
- Kein Gefahrstoff (kennzeichnungsfrei)! Mineralisches Öl das im Sinne verkehrsrechtlicher Bestimmung kein Gefahrengut ist
- Nitrit- und Chlorfrei!
- Enthält keine Schwermetalle
- Rostschützend
- Refraktometerfaktor: 1,8

**Verwendung:**
Erhöht signifikant die Standzeiten und Oberflächengüte beim: SÄGEN, FRÄSEN, GEWINDESCHNEIDEN, REIBEN, BOHREN, DREHEN, HPC. Für Kühlmittelsysteme > 20 bar

**Mischung:**
5% Öl in Wasser für Stähle geringer Festigkeit (Baustähle) sowie NE-Metalle (Alu, Kupfer, Messing)
10% Öl in Wasser geben für hochlegierte Stähle (Edelstähle). Bei schwierigsten Zerspanproblemen den Ölanteil erhöhen.

(209 Liter Fass auf Anfrage erhältlich)

## MECUTOIL 100

10 l | € 92,30 | 60 1100 10

5 l | € 46,20 | 60 1100 5

2,5 l | € 23,50 | 60 1100 25




10 l 5 l 2,5 l

### HOCHLEISTUNGS-KÜHLSCHMIER-KONZENTRAT. SILIKONFREI
### mit **hohem** Mineralölanteil

MECUTOIL 100 ist ein hervorragender, hochergiebiger, universeller, wassermischbarer Kühlschmierstoff mit einem Mineralölanteil von 60 %. Er ist kennzeichnungsfrei und für die allgemeine Bearbeitung und die innere Kühlmittelzufuhr (IKZ) vorwiegend für Kühlsysteme mit <20 bar Kühlmitteldruck geeignet. Nicht geeignet für Kühlsysteme mit >20 bar Kühlmitteldruck.
Ist in Wasser zu verrühren!

**Eigenschaften:**
- Wassermischbar
- Für konventionelle Kühlsysteme mit Überflutungskühlung
- Kein Gefahrstoff (kennzeichnungsfrei)! Mineralisches Öl das im Sinne verkehrsrechtlicher Bestimmung kein Gefahrengut ist
- Nitrit- und Chlorfrei
- Enthält keine Schwermetalle
- Rostschützend
- Refraktometerfaktor: 1,0

**Verwendung:**
Erhöht signifikant die Standzeiten und Oberflächengüte beim: SÄGEN, FRÄSEN, GEWINDESCHNEIDEN, REIBEN, BOHREN, DREHEN. Für Kühlmittelsysteme <20 bar

**Mischung:**
5% Öl in Wasser für Stähle geringer Festigkeit (Baustähle) sowie NE-Metalle (Alu, Kupfer, Messing)
10% Öl in Wasser geben für hochlegierte Stähle (Edelstähle). Bei schwierigsten Zerspanproblemen den Ölanteil erhöhen.

(209 Liter Fass auf Anfrage erhältlich)



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## MECUTOIL 100 PRO

### HIGH PERFORMANCE COOLING LUBRICANT CONCENTRATE. SILICONE FREE
### with a **low** mineral oil content




This product is a very useful addition to the portfolio, where so far only conventional cooling was covered with the Mecutoil 100. Due to the lubricating effect and the high mineral oil content of the MECUTOIL 100 you should use our Mecutoil 100 PRO if the coolant pressure is >20 bar.

Mecutoil 100 PRO is a universal, water-miscible cooling lubricant with a mineral oil content of 20 % for the general machining and for the internal coolant supply. Mainly for cooling systems with >20 bar coolant pressure like the High Performance Cutting (HPC) or high-pressure machining with IKZ 80, but also for coolant systems with <20 bar coolant pressure.
To be mixed in water!

**Properties:**
- Water miscible
- For high performance cutting (HPC), high pressure machining >20 bar
- No hazardous substance (free of labeling)! Mineral oil that is not hazardous under traffic law provision
- Nitrite and chlorine free!
- Does not contain heavy metals
- Rustproof
- Refractometer factor: 1.8

**Application:**
Significantly increases tool life and surface quality when: SAWING, MILLING, TAPPING, GRINDING, DRILLING, HPC.
For coolant systems >20 bar

**Mixture:**
5% oil in water for low-strength steels (structural steels) and non-ferrous metals (aluminum, copper, brass)
10% oil in water for high-alloy steels (stainless steels). For the most difficult cutting problems increase the oil content.

(209 liter barrel available on request)

## MECUTOIL 100

### HIGH PERFORMANCE COOLING LUBRICANT CONCENTRATE. SILICONE FREE
### with a **high** mineral oil content




MECUTOIL 100 is an excellent, highly productive, universal, water-miscible cooling lubricant, free of labeling for general processing and for the internal coolant supply (IKZ) with a mineral oil content of 60 %, mainly for cooling systems with <20 bar coolant pressure. Not suitable for cooling systems with >20 bar coolant pressure.
To be mixed in water!

**Properties:**
- Water miscible
- For conventional cooling systems with flood cooling
- No hazardous substance (free of labeling)! Mineral oil that is not hazardous under traffic law provision
- Nitrite and chlorine free!
- Does not contain heavy metals
- Rustproof
- Refractometer factor: 1.0

**Application:**
Significantly increases tool life and surface quality when: SAWING, MILLING, TAPPING, GRINDING, DRILLING.
For coolant systems >20 bar

**Mixture:**
5% oil in water for low-strength steels (structural steel) and non-ferrous metals (aluminum, copper, brass)
10% oil in water for high-alloy steels (stainless steels). Increase the oil content for most difficult machining.

(209 liter barrel available on request)





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## MECUT-MMKS-MQL STEEL/ALU/COPPER

| 60 1154 | 60 1153 | 60 1150 | 60 1151 |
|---|---|---|---|
| 10 l € 199,00 | 5 l € 99,00 | 500 ml € 9,85 Dose / Can | 500 ml € 9,85 Flasche / Bottle |




### BIO-HOCHLEISTUNGS SCHNEIDÖL UND MINIMALMENGENSCHMIERÖL FÜR SCHWIERIGE SPANABHEBENDE SOWIE SPANLOSE VERARBEITUNG.

**Basisöl auf pflanzliche Produkte aufgebaut (Kokosöl, Rapsöl). Umweltschonend. Chlorfrei.**

**Verwendung:** Zum Sägen, Fräsen, Bohren, Drehen, Reiben und Gewindeschneiden hervorragend geeignet. Ebenfalls für die spanlose Bearbeitung wie Walzen, Tiefziehen, Drahtziehen, Rohrbiegen geeignet.
**Anwendung:** Besonders geeignet für die schwere Zerpsanung von rost- und hitzebeständigen Stählen, Nickellegierungen, Titan, Stahl, Guss, NE-Metalle wie Alu, Kupfer, Messing unlegiert oder legiert.
**Einsatzhinweis:** Hervorragendes Kühlschmiermittel speziell für Minimalmengen Kühl-Schmiersysteme entwickelt. Auch als Pumpspraydose ohne Treibmittel erhältlich (Art. 60 1150; genaue Bezeichnung siehe Seite 1216)

**Eigenschaften:**
- Sehr hohe Werkzeugstandzeiten
- Verbesserte Oberflächengüte
- Wirkt antikorrosiv
- Biologisch abbaubar (Anlieferungszustand)

## MECUT-MMKS-MQL STEEL/ALU/COPPER "EASY-CLEAN"

| 60 1163 | 60 1162 | 60 1152 | 60 1164 |
|---|---|---|---|
| 10 l € 152,95 | 5 l € 84,95 | 400 ml € 12,70 Dose / Can | 500 ml € 8,95 Flasche / Bottle |




### MINERALÖLFREIES-HOCHLEISTUNGS-MINIMALMENGENSCHMIERÖL FÜR MITTELSCHWERE SPANABHEBENDE SOWIE SPANLOSE VERARBEITUNG. MIT WASSER ABWASCHBAR.

**Mineralölfrei. Mit Wasser abwaschbar. Keine flüchtigen Chlorwasserstoffe.**

**Verwendung:** Zum Sägen, Fräsen, Bohren, Drehen, Reiben und Gewindeschneiden hervorragend geeignet.
Ebenfalls für spanlose Bearbeitung wie Walzen, Tiefziehen, Drahtziehen, Rohrbiegen.
**Anwendung:** Besonders geeignet für die mittelschwere Zerspanung von rost und hitzebeständigen Stählen, Nickellegierungen, Titan, Stahl, Guss, NE-Metalle wie Alu, Kupfer, Messing unlegiert oder legiert.
Alle Gussorten wie Stahlguss, Temperguss, Druckguss, Messingguss, Rotguss usw.
**Einsatzhinweis:** Hervorragendes Kühlschmiermittel mit Schwerpunkt auf die Kühlwirkung. Fertigteile mit Wasser abwaschbar. Für Minimalmengen-Kühl-Schmiersysteme entwickelt. Auch in Sprayflaschen als Schaumspray (Art. 60 1152 – genaue Bezeichnung siehe Seite 1216) und als Spritzflasche (Art. 60 1153) erhältlich.

**Eigenschaften:**
- Kein Verharzen der Fertigteile. Mit Wasser abwaschbar
- Sehr dünnflüssig dadurch geringer Verbrauch und sehr gute Kühlwirkung
- Pumpenfördermöglich
- Hohe Schnittgeschwindigkeiten möglich, geringer Verschleiß der Werkzeuge

## MECUT-MMKS UNIVERSAL STEEL/ALU/COPPER

| 60 1261 | 60 1263 | 60 1262 | 60 1264 |
|---|---|---|---|
| 25 l € 266,05 | 10 l € 112,05 | 5 l € 58,85 | 500 ml € 6,45 Flasche / Bottle |




### UNSER PREISGÜNSTIGSTES SCHNEIDÖL UND MINIMALMENGEN-SCHMIERÖL FÜR SCHWIERIGE SPANABHEBENDE VERARBEITUNG

**Basisöl auf pflanzliche Produkte aufgebaut (Kokosöl, Rapsöl). Umweltschonend. Chlorfrei.**

**Verwendung:** Zum Sägen, Fräsen, Bohren, Drehen, Reiben und Gewindeschneiden hervorragend geeignet. Ebenfalls für die spanlose Bearbeitung wie Walzen, Tiefziehen, Drahtziehen, Rohrbiegen geeignet.
**Anwendung:** Besonders geeignet für die schwere Zerpsanung von rost- und hitzebeständigen Stählen, Nickellegierungen, Titan, Stahl, Guss, NE-Metalle wie Alu, Kupfer, Messing unlegiert oder legiert.
**Einsatzhinweis:** Auch für die Minimalmengenschmierung geeignet. Für noch bessere Kühl-Schmiereigenschaften im MMKS-Bereich nutzen Sie unser MECUT-MMKS-MQL STEEL/ALU/COPPER oder MECUT-MMKS-MQL STEEL/ALU/COPPER "EASYCLEAN" (siehe oben).

**Eigenschaften:**
- Sehr hohe Werkzeugstandzeiten
- Verbesserte Oberflächengüte
- Wirkt antikorrosiv
- Biologisch abbaubar (Anlieferungszustand)



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