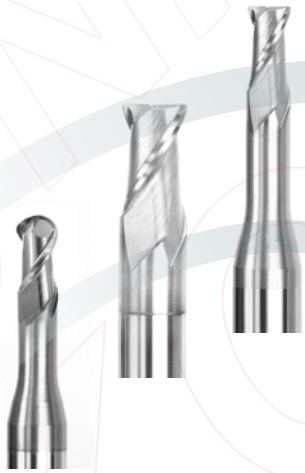

# Copper

High-performance end mills with CrN coating for HSC of copper electrode.

Hochleistungs-Schaftfräser mit CrN Beschichtung für die HSC von Kupfer-Elektrode.

105 - 114

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| Tool code | | CE 235 | CE 435 | CELN 235 | CB 235 | CBLS 235 | CBLN 235 | CR 230 |
| Number of teeth | | Z=2 | Z=4 | Z=2 | Z=2 | Z=2 | Z=2 | Z=2 |
| Page | | 108 | 108 | 109 | 110 | 111 | 112 | 113 |
| | | VHM | VHM | VHM | VHM | VHM | VHM | VHM |
| | | CrN Coating | CrN Coating | CrN Coating | CrN Coating | CrN Coating | CrN Coating | CrN Coating |
| | | | | | | | | |
| | | 35° | 35° | 35° | 35° | 35° | 35° | 30° |
| | | 90° | 90° | 90° | | | | R |
| | | | | | | | | |
| | | | | | | | | |
| | | HSC | HSC | HSC | HSC | HSC | HSC | HSC |
| N | Copper alloy | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| | Al and Al-alloy | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| Tool code | | CRLN 230 | | | | | | |
| Number of teeth | | Z=2 | | | | | | |
| Page | | 114 | | | | | | |
| | | VHM<br>CrN Coating<br><br>30°<br>R<br><br><br>HSC | | | | | | |
| N | Copper alloy | ◎ | | | | | | |
| | Al and Al-alloy | ○ | | | | | | |
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Copper

DNKO

| VHM | 35° | HSC |
|---|---|---|
| CrN Coating | 90° | |

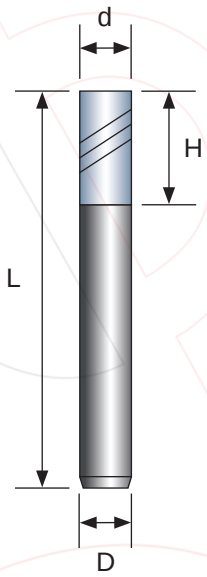
## CrN coated end mills
For HSC of copper electrode

## CrN beschichtet-Schaftfräser
Für die HSC von Kupfer-Elektrode

| N | |
|---|---|
| Copper alloy | ◎ |
| Al and Al-alloy | ○ |

Example: Order code CE 235 002-00404

| d-Code | d x H x D | L | CE 235 Z=2 | CE 435 Z=4 |
|---|---|---|---|---|
| 002-00404 | 0.2 x 0.4 x C 4 | 50 | ◇ | |
| 003-00604 | 0.3 x 0.6 x C 4 | 50 | ◇ | |
| 004-00804 | 0.4 x 0.8 x C 4 | 50 | ◇ | |
| 005-01004 | 0.5 x 1.0 x C 4 | 50 | ● | |
| 006-01204 | 0.6 x 1.2 x C 4 | 50 | ◇ | |
| 008-01604 | 0.8 x 1.6 x C 4 | 50 | ◇ | |
| 010-03004 | 1.0 x 3.0 x C 4 | 50 | ● | |
| 015-04004 | 1.5 x 4.0 x C 4 | 50 | ◇ | |
| 020-06004 | 2.0 x 6.0 x C 4 | 50 | ● | |
| 025-07004 | 2.5 x 7.0 x C 4 | 50 | ◇ | |
| 030-08004 | 3.0 x 8.0 x C 4 | 50 | ● | ◇ |
| 040-11004 | 4.0 x 11.0 x C 4 | 50 | ● | ● |
| 050-13006 | 5.0 x 13.0 x C 6 | 50 | ◇ | ◇ |
| 060-15006 | 6.0 x 15.0 x C 6 | 50 | ● | ● |
| 080-20008 | 8.0 x 20.0 x C 8 | 60 | | ● |
| 100-25010 | 10.0 x 25.0 x C10 | 75 | | ● |
| 120-30012 | 12.0 x 30.0 x C12 | 75 | | ● |
| Long cut length / Lange schneidkantenlänge | | | | |
| 030-15004 | 3.0 x 15.0 x C 4 | 75 | | ◇ |
| 040-20004 | 4.0 x 20.0 x C 4 | 75 | | ◇ |
| 060-25006 | 6.0 x 25.0 x C 6 | 75 | | ◇ |
| 080-30008 | 8.0 x 30.0 x C 8 | 75 | | ◇ |
| 100-40010 | 10.0 x 40.0 x C10 | 100 | | ◇ |
| 120-45012 | 12.0 x 45.0 x C12 | 100 | | ◇ |




Tolerance / Toleranz

| Range | Diameter |
|---|---|
| d < 1 | 0 / -0.015 |
| 1 ≤ d < 8 | 0 / -0.02 |
| 8 ≤ d < 18 | 0 / -0.03 |

Copper



● Stock item, subject to confirmation ◇ On request

NKO

| VHM | 35° | HSC |
|---|---|---|
| CrN Coating | 90° | |

## CrN coated end mills, long neck

For deep milling of copper electrode

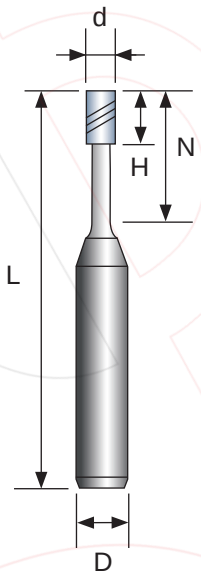
## CrN beschichtet-Schaftfräser, überlaufhals

Für die HSC von Kupfer-Elektrode

Example: Order code CELN 235 005-04004

| | Copper alloy | ◎ |
|---|---|---|
| N | Al and Al-alloy | ○ |

| d-Code | d x N x D | H | L | CELN 235 Z=2 | |
|---|---|---|---|---|---|
| 005-04004 | 0.5 x N 4 x C 4 | 0.7 | 50 | ● | |
| 005-06004 | 0.5 x N 6 x C 4 | 0.7 | 50 | ◇ | |
| 005-08004 | 0.5 x N 8 x C 4 | 0.7 | 50 | ◇ | |
| 008-04004 | 0.8 x N 4 x C 4 | 1.2 | 50 | ◇ | |
| 008-06004 | 0.8 x N 6 x C 4 | 1.2 | 50 | ● | |
| 008-08004 | 0.8 x N 8 x C 4 | 1.2 | 50 | ◇ | |
| 010-06004 | 1.0 x N 6 x C 4 | 1.5 | 50 | ◇ | |
| 010-08004 | 1.0 x N 8 x C 4 | 1.5 | 50 | ● | |
| 010-10004 | 1.0 x N 10 x C 4 | 1.5 | 50 | ◇ | |
| 010-12004 | 1.0 x N 12 x C 4 | 1.5 | 50 | ◇ | |
| 015-08004 | 1.5 x N 8 x C 4 | 2.3 | 50 | ◇ | |
| 015-12004 | 1.5 x N 12 x C 4 | 2.3 | 50 | ● | |
| 015-16004 | 1.5 x N 16 x C 4 | 2.3 | 60 | ◇ | |
| 020-08004 | 2.0 x N 8 x C 4 | 3.0 | 50 | ◇ | |
| 020-12004 | 2.0 x N 12 x C 4 | 3.0 | 50 | ● | |
| 020-16004 | 2.0 x N 16 x C 4 | 3.0 | 60 | ◇ | |
| 020-20004 | 2.0 x N 20 x C 4 | 3.0 | 60 | ◇ | |
| 030-16006 | 3.0 x N 16 x C 6 | 4.5 | 60 | ● | |
| 040-20006 | 4.0 x N 20 x C 6 | 6.0 | 60 | ● | |
| 060-30006 | 6.0 x N 30 x C 6 | 9.0 | 75 | ◇ | |




Tolerance / Toleranz

| Range | Diameter |
|---|---|
| d < 1 | 0 / -0.015 |
| 1 ≤ d < 8 | 0 / -0.02 |

Copper

DNKO

| VHM | 35° | HSC |
|---|---|---|
| CrN Coating | | |

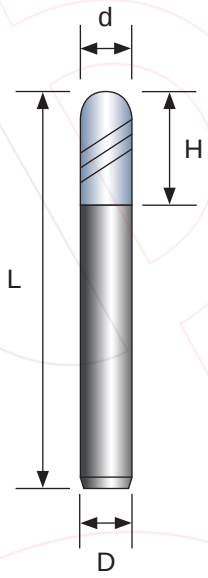
## CrN coated ball nose end mills
For HSC of copper electrode

## CrN beschichtet-Kugelkopffräser
Für die HSC von Kupfer-Elektrode

Example: Order code CB 235 004-00804

| | | |
|---|---|---|
| N | Copper alloy | ◎ |
| | Al and Al-alloy | ○ |

| d-Code | d x H x D | L | CB 235 Z=2 | |
|---|---|---|---|---|
| 004-00804 | R0.2 x 0.8 x C 4 | 50 | ◇ | |
| 005-01004 | R0.25 x 1.0 x C 4 | 50 | ● | |
| 006-01204 | R0.3 x 1.2 x C 4 | 50 | ● | |
| 008-01604 | R0.4 x 1.6 x C 4 | 50 | ◇ | |
| 010-02004 | R0.5 x 2.0 x C 4 | 50 | ● | |
| 015-03004 | R0.75 x 3.0 x C 4 | 50 | ◇ | |
| 020-04004 | R1.0 x 4.0 x C 4 | 50 | ● | |
| 030-06004 | R1.5 x 6.0 x C 4 | 50 | ● | |
| 040-08004 | R2.0 x 8.0 x C 4 | 50 | ● | |




Tolerance / Toleranz

| Range | Diameter |
|---|---|
| d < 1 | 0 / -0.015 |
| 1 ≤ d < 8 | 0 / -0.02 |

Copper



● Stock item, subject to confirmation ◇ On request

| | | |
|---|---|---|
| VHM | 35° | HSC |
| CrN Coating | | |

## CrN coated ball nose end mills, long shank

For HSC of copper electrode

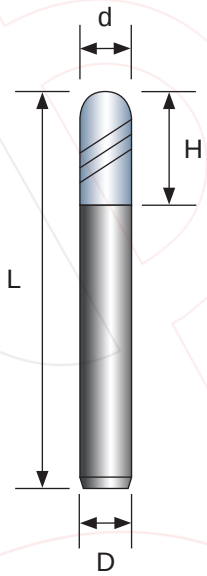
## CrN beschichtet-Kugelkopffräser, langer schaft

Für die HSC von Kupfer-Elektrode

Example: Order code CBLS 235 040-08104

| | | | CBLS 235 | |
|---|---|---|---|---|
| d-Code | d x L x D | H | Z=2 | |
| 040-08104 | R2.0 x L 75 x C 4 | 8.0 | ● | |
| 050-10106 | R2.5 x L 75 x C 6 | 10.0 | ◇ | |
| 060-12106 | R3.0 x L 75 x C 6 | 12.0 | ● | |
| 080-16308 | R4.0 x L100 x C 8 | 16.0 | ● | |
| 100-20310 | R5.0 x L100 x C10 | 20.0 | ● | |
| 120-24312 | R6.0 x L100 x C12 | 24.0 | ◇ | |

| | | |
|---|---|---|
| N | Copper alloy | ◎ |
| | Al and Al-alloy | ○ |




Tolerance / Toleranz

| Range | Diameter |
|---|---|
| 1 ≤ d < 8 | 0 / -0.02 |
| 8 ≤ d < 18 | 0 / -0.03 |

Copper

DNKO

| VHM | 35° | HSC |
|---|---|---|
| CrN Coating | | |

## CrN coated ball nose end mills, long neck

For deep milling copper electrode

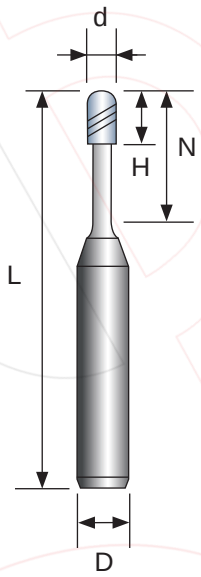
## CrN beschichtet-Kugelkopffräser - überlaufhals

Für die HSC von Kupfer-Elektrode

Example: Order code CBLN 235 006-04004

| N | | |
|---|---|---|
| | Copper alloy | ◎ |
| | Al and Al-alloy | ○ |

| d-Code | d x N x D | H | L | CBLN 235 Z=2 | |
|---|---|---|---|---|---|
| 006-04004 | R0.3 x N 4 x C 4 | 0.6 | 50 | ● | |
| 006-06004 | R0.3 x N 6 x C 4 | 0.6 | 50 | ● | |
| 008-04004 | R0.4 x N 4 x C 4 | 0.8 | 50 | ● | |
| 008-08004 | R0.4 x N 8 x C 4 | 0.8 | 50 | ● | |
| 010-06004 | R0.5 x N 6 x C 4 | 1.0 | 50 | ● | |
| 010-10004 | R0.5 x N 10 x C 4 | 1.0 | 50 | ● | |
| 015-08004 | R0.75 x N 8 x C 4 | 1.5 | 50 | ● | |
| 015-16004 | R0.75 x N 16 x C 4 | 1.5 | 60 | ● | |
| 020-10004 | R1.0 x N 10 x C 4 | 2.0 | 50 | ● | |
| 020-20004 | R1.0 x N 20 x C 4 | 2.0 | 60 | ● | |
| 030-16006 | R1.5 x N 16 x C 6 | 3.0 | 60 | ● | |
| 030-30006 | R1.5 x N 30 x C 6 | 3.0 | 75 | ◇ | |
| 040-20006 | R2.0 x N 20 x C 6 | 4.0 | 75 | ● | |
| 040-30006 | R2.0 x N 40 x C 6 | 4.0 | 100 | ◇ | |
| 060-30006 | R3.0 x N 30 x C 6 | 6.0 | 75 | ● | |
| 060-60006 | R3.0 x N 60 x C 6 | 6.0 | 100 | ◇ | |




Tolerance / Toleranz

| Range | Diameter |
|---|---|
| d < 1 | 0 / -0.015 |
| 1 ≤ d < 8 | 0 / -0.02 |

Copper



● Stock item, subject to confirmation ◇ On request

| | | |
|---|---|---|
| VHM | 30° | HSC |
| CrN Coating | R | |

# CrN coated corner radius end mills

For HSC of copper electrode

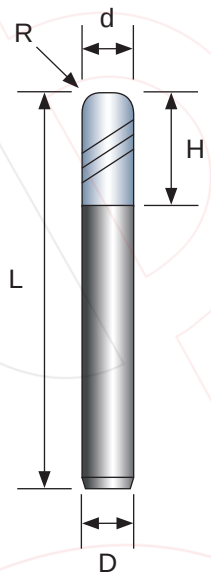
## CrN beschichtet-Eckradiusfräser

Für die HSC von Kupfer-Elektrode

| | |
|---|---|
| N | Copper alloy ◎ |
| | Al and Al-alloy ○ |

Example: Order code CR 230 060-05006

| d-Code | d x R x H x D | L | CR 230 Z=2 | |
|---|---|---|---|---|
| 060-05006 | 6.0 x R0.5 x 12.0 x C 6 | 50 | ◇ | |
| 060-10006 | 6.0 x R1.0 x 12.0 x C 6 | 50 | ● | |
| 080-05008 | 8.0 x R0.5 x 16.0 x C 8 | 60 | ◇ | |
| 080-10008 | 8.0 x R1.0 x 16.0 x C 8 | 60 | ● | |
| 100-05010 | 10.0 x R0.5 x 20.0 x C10 | 75 | ◇ | |
| 100-10010 | 10.0 x R1.0 x 20.0 x C10 | 75 | ● | |
| 120-05012 | 12.0 x R0.5 x 24.0 x C12 | 75 | ◇ | |
| 120-10012 | 12.0 x R1.0 x 24.0 x C12 | 75 | ◇ | |




Tolerance / Toleranz

| Range | Diameter |
|---|---|
| 1 ≤ d < 8 | 0 / -0.02 |
| 8 ≤ d < 18 | 0 / -0.03 |

Copper

DNKO

| VHM | 30° | HSC |
|---|---|---|
| CrN Coating | R | |

## CrN coated corner radius end mills, long neck

For deep milling copper electrode

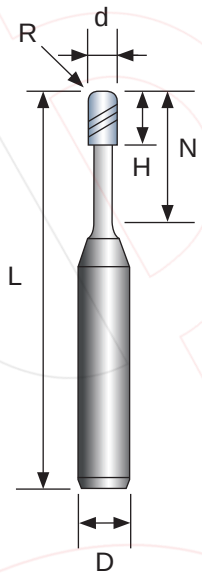
## CrN beschichtet-Eckradiusfräser - überlaufhals

Für die HSC von Kupfer-Elektrode

Example: Order code CRLN 230 010-02084

| N | | |
|---|---|---|
| | Copper alloy | ◎ |
| | Al and Al-alloy | ○ |

| d-Code | d x R x N x D | H | L | CRLN 230 Z=2 | |
|---|---|---|---|---|---|
| 010-02064 | 1.0 x R0.2 x N 6 x C 4 | 1.2 | 50 | ● | |
| 010-02084 | 1.0 x R0.2 x N 8 x C 4 | 1.2 | 50 | ◇ | |
| 010-02104 | 1.0 x R0.2 x N 10 x C 4 | 1.2 | 50 | ● | |
| 010-02124 | 1.0 x R0.2 x N 12 x C 4 | 1.2 | 50 | ◇ | |
| 015-02124 | 1.5 x R0.2 x N 12 x C 4 | 1.8 | 50 | ● | |
| 015-02204 | 1.5 x R0.2 x N 20 x C 4 | 1.8 | 60 | ◇ | |
| 020-02124 | 2.0 x R0.2 x N 12 x C 4 | 2.4 | 50 | ● | |
| 020-02164 | 2.0 x R0.2 x N 16 x C 4 | 2.4 | 60 | ◇ | |
| 020-02204 | 2.0 x R0.2 x N 20 x C 4 | 2.4 | 60 | ● | |
| 020-05124 | 2.0 x R0.5 x N 12 x C 4 | 2.4 | 50 | ● | |
| 020-05164 | 2.0 x R0.5 x N 16 x C 4 | 2.4 | 60 | ◇ | |
| 020-05204 | 2.0 x R0.5 x N 20 x C 4 | 2.4 | 60 | ● | |
| 030-02246 | 3.0 x R0.2 x N 24 x C 6 | 3.6 | 75 | ● | |
| 030-05246 | 3.0 x R0.5 x N 24 x C 6 | 3.6 | 75 | ● | |
| 040-05246 | 4.0 x R0.5 x N 24 x C 6 | 4.8 | 75 | ● | |




Tolerance / Toleranz

| Range | Diameter |
|---|---|
| 1 ≤ d < 8 | 0 / -0.02 |

Copper



● Stock item, subject to confirmation ◇ On request