

4 Flutes CrN COAT for Copper Electrode Milling



Size $\phi 3 \sim \phi 12$

CRN-ES4000



Material Applications (★ Highly Recommended ● Recommended ○ Suggested)

Work Material																	
Carbon Steels S45C S55C	Alloy Steels SK / SCM SUS	Prehardened Steels NAK HPM	Hardened Steels					Cast Iron	Aluminum Alloys	Graphite	Copper	Plastics	Glass Filled Plastics	Titanium Alloys	Heat Resistant Alloys	Cemented Carbide	Hard Brittle (Non-Metallic) Materials
			~50HRC	~55HRC	~60HRC	~65HRC	~70HRC										
											★	○					

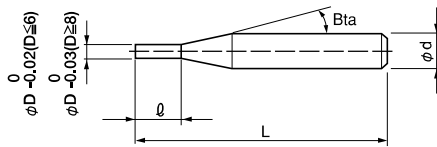
Features

CrN COAT offers longer tool life.

Special geometry designed for Copper offers excellent milling performance.

Refer to page 186 for 2 flute CRN-ES.

Diameter Tolerance: $0/-0.02(D \leq 6)$, $0/-0.03(D \geq 8)$



The shank taper angle shown is not an exact value and to avoid contact with the work piece, we recommend the user controls the precise value of this angle. Shank taper angle should not make contact with the work piece.

Total 10 models

Unit (mm)

Model Number	Outside Diameter ϕD	Length of Cut ℓ	Shank Taper Angle Bta	Overall Length L	Shank Diameter ϕd	Suggested Retail Price ¥
CRN-ES 4030-0900	3	9	11°	50	6	4,620
CRN-ES 4030-1200		12	11°	55	6	6,820
CRN-ES 4040-1200	4	12	11°	50	6	4,950
CRN-ES 4040-1600		16	11°	55	6	7,150
CRN-ES 4050-1500	5	15	11°	55	6	5,060
CRN-ES 4060-1800	6	18	—	60	6	5,390
CRN-ES 4060-2400		24	—	65	6	8,250
CRN-ES 4080-2400	8	24	—	80	8	9,480
CRN-ES 4100-3000	10	30	—	100	10	12,720
CRN-ES 4120-3600	12	36	—	100	12	15,840

Milling Conditions for CRN-ES (4 Flutes)

Side Milling

◆3D flute length type

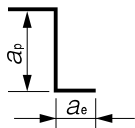
WORK MATERIAL		COPPER C1100			
Model Number	Outside Diameter (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a_p Axial Depth (mm)	a_e Radial Depth (mm)
4030-0900	3	10,000	600	4.5	0.3
4040-1200	4	8,000	650	6	0.4
4050-1500	5	6,500	750	7.5	0.5
4060-1800	6	5,500	750	9	0.6
4080-2400	8	4,200	700	12	0.8
4100-3000	10	3,500	700	15	1
4120-3600	12	2,800	700	18	1.2

◆4D flute length type

WORK MATERIAL		COPPER C1100			
Model Number	Outside Diameter (mm)	Spindle Speed (min ⁻¹)	Feed Rate (mm/min)	a_p Axial Depth (mm)	a_e Radial Depth (mm)
4030-1200	3	5,000	300	7.5	0.15
4040-1600	4	4,000	325	10	0.2
4060-2400	6	3,500	400	15	0.3

Length of Cut	3D Flute Length Type	4D Flute Length Type
Milling		
Side Milling	a_p 1.5D a_e 0.1D	a_p 2.5D a_e 0.05D

Side Milling



D : Outside Diameter (mm)

Note:

- Decrease both spindle speed and feed rate proportionally in case of chattering.
- Adjust the milling amount and feed rate in accordance with required precision.
- Recommend water soluble or oil coolant.
- Recommended for Pure Copper. Not suitable for Tungsten Copper.

Milling Example $\phi 6$

Pure Copper C1100

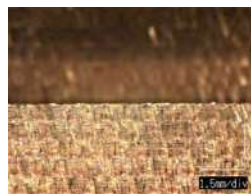


CRN-ES
 $\phi 6 \times L24$

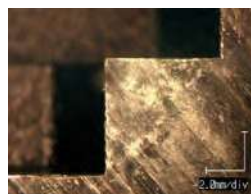
4 flute Square for Steels
 $\phi 6 \times L24$

Milling Method	Z-level slotting Side milling
Spindle Speed	3,500 min ⁻¹
Feed Rate	2,500 mm/min
a_p	0.6 mm
a_e	4.2 mm
Coolant	Water Soluble

Upper surface



Outlet end



CRN-ES has a edge shape dedicated to copper processing that emphasizes sharpness compared to steel. More effective in suppressing burrs than for steel!

4 Flutes

φ3mm Shank
V Series

UDC-PCD
Series

CBN
Series

Square

Long Neck
Square

Radius

Long Neck
Radius

Taper Neck
Radius

Ball / Long
Shank Ball

Long Neck
Ball

Taper Neck
Ball

Taper

Barrel

Spiral
V Cutter

Drill

Technical Data