



## Z-Trode®

The ideal cap electrode for resistance welding of light-to-medium gauge coated and uncoated steels and aluminum alloys

The Z-Trode® cap electrode is cold-formed from CDA Alloy 15000 zirconium copper. The combination of advanced copper metallurgy and our cold-forming technology gives you an electrode that outperforms conventional electrodes.

### Prevents sticking

Chrome in a conventional electrode does not prevent zinc from alloying with copper to create a brass intermetallic across the weld face, this intermetallic diminishes the weld nugget size and degrades the weld quality. Z-Trode is an alloy of pure zirconium and oxygen-free copper. The zirconium discourages the alloying effect on the electrode weld face and prevents sticking. This increases productivity without special dressings or increased power requirements to weld coated materials.

### Resists mushrooming

When compared to CuCrZr and CuCr alloys, the zirconium-copper alloy resists mushrooming and wear due to its superior conductivity. Z-Trode's conductivity allows it to be used with lower current settings and less heat, greatly improving the alloy's resistance to mushrooming.

### Requires less energy

In comparison to CuCrZr and CuCr alloys, Z-Trode requires lower current due to its higher electrical conductivity, when used on both sides of the weldment. This results in longer electrode life, more consistent welds and energy savings. Weld current setting can be reduced up to 20% from the conventional CuCrZr and CuCr settings, with no loss in weld integrity.

### Reduces downtime

Overall maintenance of Z-Trode caps is much less than with conventional electrodes, increasing welding process and production efficiencies. Z-Trode caps require no warm ups or preparation following electrode changes, which in turn makes the Z-Trode cap the most cost effective with its extended life expectancy and lower energy requirements.



### About Luvata

Luvata is a world leader in metal solutions manufacturing and related engineering services to industries such as renewable energy, automotive, healthcare, and power generation and distribution. The company's continued success is attributed to its longevity, technological excellence and strategy of building partnerships beyond metals. Employing approximately 1,400 staff in 6 countries, Luvata works in partnership with customers such as ABB, CERN, Siemens and Toyota. Luvata is a group company of Mitsubishi Materials Corporation.

## Quality Properties\*

Alloy	C15000 CuZr, EN ISO 5182 A2/4, DIN 17666 Wn 2.1580, RWMA Class I		
Chemical composition	Zirconium 0.15% Cu balance		
Physical material properties at 20°C	Mass	8.89g/cm <sup>3</sup>	
	Specific heat	385 J/kg.K	
	Thermal conductivity	367 W/m.K	
	Expansion coefficient (20-300°C)	16.9 x 10 <sup>-6</sup> m/mK	
	Electric conductivity	min. 53 S/m	
	Solution annealed and hardened	min. 92% IACS	
	Softening temperature	1083°C	
Dimensions and tolerances	To ISO 5821 or other standards as required. Special electrodes to customer drawing.		
Packaging	Most items in cartons of 500 pieces.		
Documentation	Acceptance test certificate EN 10204 3.1 B possible if desired against a charge.		
Area of application	Male and female resistance welding electrodes Backing dies - series and indirect Projection welding electrodes		

## Mechanical Properties\*

Form of supply	Tensile strength [N/mm <sup>2</sup> ]	0.2% offset yield strength [N/mm <sup>2</sup> ]	Elongation AS [%]	Hardness HV
Electrodes	≥ 420	≥ 379	≥ 12	≥ 132

## Physical Properties\*

Hardness at ambient temperature	Minimum 65 HRB
Conductivity	Minimum 85% IACS

\*Errors and omissions excepted. Values given are industry standards.

**Luvata Ohio Inc.**  
1376 Pittsburgh Drive  
Delaware  
Ohio 43015  
USA  
Tel: +1 740 363 1981

**Luvata Welwyn Garden Ltd.**  
Centrapark  
Bessemer Road  
Welwyn Garden City  
Hertfordshire AL7 1HT  
United Kingdom  
Tel: +44 1707 379789

**MM Metal Products Suzhou**  
53 Sanzhuang Street  
Weiting Town  
Suzhou Industrial Park  
Jiangsu Province  
215121 China  
Tel: +86 512 6285 1018

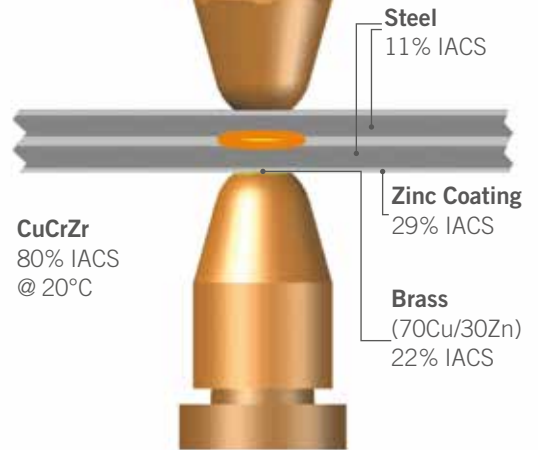
**Luvata Sao Paulo**  
Avenida dos  
Autonomistas, nº 4.900  
Galpão PR406-B  
06194-060  
Osasco - SP, Brazil  
Tel: +55 11 3513 2003



luvata.com

## Conductivities

**Z-Trode**  
85% IACS  
@ 20°C



**CuCrZr**  
80% IACS  
@ 20°C

## Melting Points

Zinc ~420°C  
Brass (70Cu/30Zn) ~1027°C  
CuCrZr ~1075°C  
**Z-Trode** ~1080°C  
Steel ~1427°C

Electrical and physical constants

## Spatter matters

Z-Trode is the electrode of choice for the Spatter Reduction Project. The reduction or even elimination of weld expulsions reduces maintenance, protective clothing and rework costs.

## Traceability

All materials are fully traceable. Z-Trode electrodes can be recognized by their flats around the periphery of the electrode.