



## A-Trode®

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

### A-Trode® production

Produced by Luvata's proprietary billet casting process, A-Trode's freedom from oxygen allows us to alloy the copper with the optimum levels of chrome and zirconium. Electrodes are cold headed or machined to suit the required shape.

Luvata has a long history of supplying high quality CuCrZr (A-Trode) electrodes.

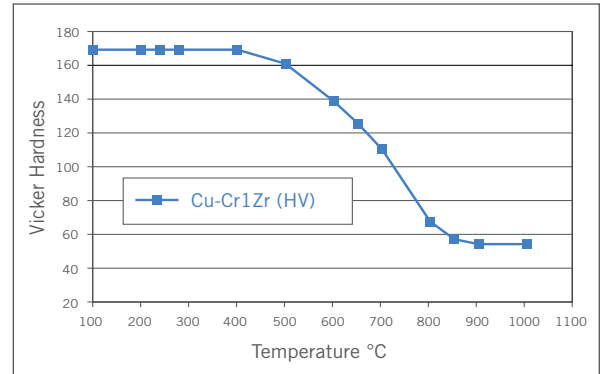


### About Luvata

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	C18150 CuCrZr, EN ISO 5182 A2/2, DIN 17666 Wn 2.1293, RWMA Class II														
Chemical composition	Cr 0.7% to 1.2%, Zr 0.06% to 0.15%. Others max. 0.2%, Cu balance.														
Physical material properties at 20°C	<table border="0"> <tr> <td>Mass</td> <td>8.9g/cm<sup>3</sup></td> </tr> <tr> <td>Specific heat</td> <td>376 J/kg.K</td> </tr> <tr> <td>Thermal conductivity</td> <td>320 W/m.K</td> </tr> <tr> <td>Expansion coefficient (20-300°C)</td> <td>17.0 x 10<sup>-6</sup> m/mK</td> </tr> <tr> <td>Electric conductivity</td> <td>min. 43 S/m</td> </tr> <tr> <td>Solution annealed and hardened</td> <td>min. 74% IACS</td> </tr> <tr> <td>Softening temperature</td> <td>min. 500°C</td> </tr> </table>	Mass	8.9g/cm <sup>3</sup>	Specific heat	376 J/kg.K	Thermal conductivity	320 W/m.K	Expansion coefficient (20-300°C)	17.0 x 10 <sup>-6</sup> m/mK	Electric conductivity	min. 43 S/m	Solution annealed and hardened	min. 74% IACS	Softening temperature	min. 500°C
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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 Seam welding wheels Projection welding electrodes														



A-Trode® metallurgy



Conventional CuCrZr grain structure

## 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	≥ 490	≥ 430	≥ 15	≥ 172

## Physical Properties

Hardness at ambient temperature	Minimum 80 HRB
Conductivity	Minimum 80% IACS



Luvata's CuCrZr fine grain structure

Errors and omissions excepted. Values given are industry standards.

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