



Zirconium Copper

The softening temperature of pure copper can be substantially increased by alloying small amount of zirconium while maintaining excellent electrical and thermal conductivity. Zirconium content of 0,15% increases the softening temperature of pure copper by as much as 300°C.

Luvata zirconium copper is manufactured from oxygen-free copper and can be brazed in a reducing atmosphere without dimensional changes and risk of internal porosity due to hydrogen embrittlement. Luvata CuZr can be easily welded and it is well suited for electron beam welding. Luvata's Z-Trode® cap electrode is cold-formed from zirconium copper.



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 over 1,400 staff in 7 countries, Luvata works in partnership with customers such as ABB, CERN, Siemens and Toyota. Luvata is a group company of Mitsubishi Materials Corporation.

Manufacture

Mechanical and electrical properties of zirconium copper are obtained through thermomechanical treatment which typically consist of the following steps: solution annealing followed by rapid quenching to water bath, cold working, aging at 400-450°C and cold working to final dimensions. The final metallographical structure of zirconium copper consists of finely dispersed Cu_5Zr precipitates which develop during the aging treatment. Aging treatment is therefore essential to achieve high resistance against softening at elevated temperature and high electrical conductivity.

Properties

Depending on the manufacturing process the electrical conductivity varies from 84 to 95% IACS while typical value is 90% IACS. Hardness can be as high as 150 HV but in most applications lower hardness is adequate. The hardness and electrical conductivity depend on each other in such a way that aiming at maximum hardness reduces the conductivity.

Advantages of Luvata Zirconium Copper include:

- Higher softening temperature than pure copper
- High electrical and thermal conductivity
- Oxygen-free

Applications

- Spot welding electrodes
- MIG/MAG welding contact tips
- Semiconductor bases
- Commutators bars
- Radial stalks for generator rotors
- Continuous casting moulds

Specification

Luvata Alloy	Composition	Corresponding Alloy	
	%	EN – CEN/TS	ASTM / USA
ZrK015	Cu+Ag min 99,8% Zr 0,1 – 0,2	CuZr / CW120C	CDA / C15000



Semiconductor bases

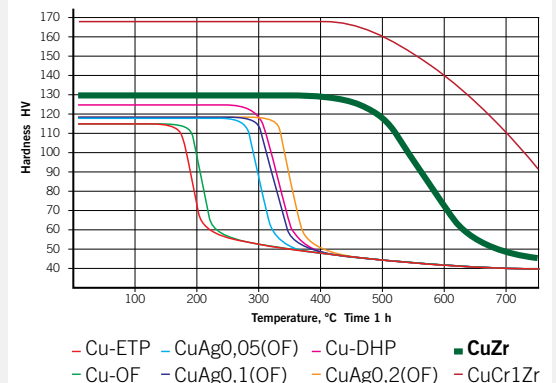


Z-Trode® cap electrodes



Commutator

Softening of copper alloys in elevated temperature



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