

## RWMA Class 1 - Copper Zirconium (CuZr)

UNS C15000 | High Conductivity for Galvanized &amp; Coated Steels

## RWMA CLASS 1

Reference: AWS J1.3/J1.3M:2020-AMD1 - Specification for Materials Used in Resistance Welding Electrodes

## CHEMICAL COMPOSITION

Base Metal	Copper (Cu)
Zirconium (Zr)	0.10 - 0.20%
Copper + Silver	Balance (min 99.8%)

## ALLOY IDENTIFICATION

UNS Designation	C15000
RWMA Class	Class 1 (Group A)
Common Name	Copper Zirconium, CuZr

## MINIMUM PHYSICAL PROPERTIES (AWS J1.3 Table 5)

Property	Min. Value	Unit	Test Method
Electrical Conductivity	80	% IACS	ASTM E1004
Rockwell Hardness	65	HRB	ASTM E18
Tensile Strength	60	ksi (414 MPa)	ASTM E8
Yield Strength (0.5% ext.)	45	ksi (310 MPa)	ASTM E8
Elongation (2" or 4D)	13	%	ASTM E8

## TYPICAL PHYSICAL PROPERTIES

Property	Value	Unit
Density	8.89	g/cm3 (0.321 lb/in3)
Thermal Conductivity	365	W/m-K
Softening Temperature	525	C (977 F)
Melting Point	1080	C (1976 F)

## RECOMMENDED APPLICATIONS

- Galvanized steels** - Hot-dip galvanized, electrogalvanized, Galvanneal (GA)
- Coated steels** - Al-Si coated (Usibor), Zn-Ni coated for automotive
- Seam welding wheels** - For coated materials where sticking is a concern
- Anti-sticking applications** - Where zinc pickup on electrodes is problematic

## WHY CLASS 1 FOR GALVANIZED STEELS?

When welding galvanized steels, zinc coatings melt at ~420C and tend to alloy with electrode copper, forming brass (CuZn). Class 1's higher conductivity (80% IACS vs. 75% for Class 2) dissipates heat faster, keeping electrode face temperature below the zinc-copper alloying point. This reduces sticking, buildup, and electrode wear.

**NOTE:** For bare low-carbon steels and general spot welding, RWMA Class 2 (C18200 or C18150) offers better hardness/wear resistance balance. Class 1 is specifically optimized for coated materials where maximum conductivity prevents electrode contamination.

