ALCAVIL

Copper Electrodes & Alloys for Resistance Welding

TECHNICAL DATA SHEET
TDS-W-R01 | 2024-11

RWMA Class 13 - Pure Tungsten

UNS R07005 / WP

RWMA CLASS 13

Ref: AWS J1.3/J1.3M:2020 - Specification for Materials Used in Resistance Welding Electrodes and Related Equipment
ISO 6848:2015 - Tungsten electrodes for inert gas shielded arc welding (color codes)

MINIMUM AWS J1.3 PROPERTIES - CLASS 13

Property	Minimum	Unit
Electrical Conductivity	**30**	**% IACS**
Hardness	**69**	**HRA**

Note: Hardness in HRA (Rockwell A) scale, not HRB

CHEMICAL COMPOSITION - WP (Pure)

Tungsten (W)	Impurities	ISO Color
99.95% min	≤0.1%	GREEN

PHYSICAL PROPERTIES

Property	Value	Unit
Electrical Conductivity	30 - 31	% IACS
Density	19.25	g/cm3
Melting Point	3,422	C
Thermal Conductivity	173	W/m-K
Electrical Resistivity	5.3	uOhm-cm
Elastic Modulus	411	GPa

APPLICATIONS PER AWS J1.3

- Cross-wire welding of copper/brass wire
- Welding stranded wire to terminals
- Resistance brazing
- Upsetting
- Welding silver components
- Applications where NO alloying should occur

KEY FEATURES

- Does NOT alloy with Cu, Ag, or brass
- Highest melting point of all metals
- Ideal for non-ferrous materials
- Does not contaminate base material
- High erosion resistance

WARNING - Specific Use

Pure tungsten (Class 13) is NOT for projection welding of nuts on steel.

Its brittleness causes thermal shock fracture in projection welding applications. For nut projection welding, use Elkonite (CuW) Classes 10-12.

Correct applications: Cross-wire welding of copper, terminal welding, resistance brazing, and any application where the electrode must not alloy with the material.

EQUIVALENT DESIGNATIONS

RWMA Class 13 | UNS R07005 | WP (Pure) | ISO Green | Pure Tungsten | Wolfram

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