GNEE METAL

TECHNICAL DATA SHEET: C10100 (OFE)

OXYGEN-FREE ELECTRONIC COPPER

Standard Compliance: ASTM B170 Grade 1, UNS C10100, CDA 101, ISO Cu-OFE

1. PRODUCT OVERVIEW

C10100 Oxygen-Free Electronic (OFE) Copper is the highest purity grade of copper commercially available. It is specifically produced by induction melting high-quality copper cathodes under a strictly controlled vacuum to prevent contamination.

Key Characteristics:

Purity: 99.99% Minimum Copper content.

Oxygen Content: Strictly controlled to below 0.0005% (5 ppm).

Anti-Embrittlement: 100% immune to hydrogen embrittlement.

Conductivity: Guaranteed minimum of 101% IACS.

2. CHEMICAL COMPOSITION (WT. %)

Copper (Cu) + Silver (Ag): 99.99% Min

Oxygen (O): 0.0005% Max (5 ppm)

Phosphorus (P): 0.0003% Max (3 ppm)

Lead (Pb): 0.0010% Max (10 ppm)

Bismuth (Bi): 0.0010% Max (10 ppm)

Tellurium (Te): 0.0002% Max (2 ppm)

Note: Total of all volatile elements (Pb, Bi, Cd, Hg, Zn, etc.) is strictly restricted.

3. PHYSICAL & MECHANICAL PROPERTIES

Density: 8.94 g/cm^3 (0.323 lb/in^3)

Melting Point: 1083 ° C (1981 ° F)

Electrical Conductivity: 101% IACS Min

Thermal Conductivity: 391 W/m • K (226 Btu/sq ft/ft hr/° F)

Coefficient of Thermal Expansion: 17.0 x 10^{-6} /° C (20-300° C)

Modulus of Elasticity: 115 GPa (17000 ksi)

4.Why Engineers Trust GNEE C10100: Our 4-Level Quality Assurance

Ultra-Low Oxygen Verification (The <5ppm Standard)

Unlike standard oxygen-free copper (C10200), our C10100 undergoes induction melting in a high-vacuum environment. We utilize specialized oxygen analyzers to ensure the oxygen content is strictly below 0.0005% (5 ppm). This is the critical factor that prevents Hydrogen Embrittlement during high-temperature brazing and ensures zero outgassing in vacuum applications.

Guaranteed Conductivity (>101% IACS)

Every batch is tested using eddy current conductivity meters calibrated to international standards. While standard ETP copper fluctuates around 100%, we guarantee a minimum of 101% IACS. This ensures your high-frequency components and MRI magnets operate with minimal heat generation and maximum efficiency.

Full Batch Traceability & MTR (Material Test Report)

We do not just provide "generic" data sheets. Every order is delivered with a Batch-Specific Mill Test Report (MTR), which includes:

Exact Chemical Analysis: Quantitative values for Pb, P, Bi, Ag, and O.

Physical Testing Results: Actual hardness, tensile strength, and conductivity of your specific batch.

Heat Number Traceability: Allowing you to trace the material back to the original vacuum-melting process.

Surface Integrity for High-Vacuum Use

For UHV (Ultra-High Vacuum) and particle accelerator projects, surface contamination is as dangerous as internal impurities. Our C10100 tubes and plates undergo:

Ultrasonic Cleaning: To remove all traces of drawing oils and lubricants.

Bright Annealing: Performed in a protective atmosphere to ensure a mirror-like, oxide-free surface that requires minimal pre-processing on your side.

5. PRODUCT FORMS AVAILABLE

Plate, Sheet & Strip: Precision thickness from 0.1mm to 200mm.

Round, Square & Flat Bar: Full range of diameters for industrial use.

Seamless Tube & Pipe: Ideal for cryogenic cooling and waveguides.

Wire & Foil: For high-frequency signal transmission.

6. CUSTOM FABRICATION SERVICES

GNEE Metal provides comprehensive secondary processing to save your production time:

Precision CNC Machining: Milling, turning, and drilling to your drawings.

Waterjet & Laser Cutting: Tolerance controlled within ±0.1mm.

Surface Polishing: Mirror finishing and ultrasonic cleaning for vacuum use.

Specialized Packaging: Vacuum-sealed VCI packaging for export protection.

CONTACT US FOR A QUOTE

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