



| | | | | | |
|--|----------------------------------|--|--|--|--|
| Brand Name | E-COPPER | | | | |
| Material Code | CW004A/2.0060 | | | | |
| Abbreviation | Cu-ETP (formerly: E-Cu57) | | | | |
| Chemical Composition (mass components) in %. Average values of alloy components | | | | | |
| Cu ≥ 99.9 | | | | | |

Features and Application Notes

E-COPPER is especially characterized by high conductivity and relatively high corrosion resistance. Like all pure metals, E-COPPER has a high temperature coefficient. The most important properties are listed only for reasons of completeness. Copper is normally supplied for thermocouples and compensation cables for protective switches. The maximum working temperature in air is +150 °C. When used as wire for thermoelectric applications, the maximum temperature can be up to +350 °C.

Form of Delivery

E-COPPER is supplied in the form of round wires in the range 0.10 to 3.00 mm Ø in bare condition. To a limited extent insulated wires, stranded wires and strips are also manufactured.

Electrical Resistance in Annealed Condition

| Temperature coefficient of electrical resistance between +20 °C and +105 °C 10 ⁻⁶ /K | Electrical resistivity in: μΩ x cm (first line) and Ω/CMF (second line) Reference Values | | | | | |
|---|---|-------------|-------------|---------|---------|---------|
| | +20 °C tolerance ±10 % | +100 °C | +200 °C | +300 °C | +400 °C | +500 °C |
| approx. + 4,300 | 1.72 | 2.30 | 3.10 | | | |
| | 10 | 14 | 19 | | | |

Physical Characteristics (Reference Values)

| Density at +20 °C | | Melting point °C | Specific heat at +20 °C J/g K | Thermal conductivity at +20 °C W/m K | Average linear thermal expansion coefficient between +20 °C and +100 °C | | Thermal EMF against copper at +20 °C μV/K |
|-------------------|-------------|---------------------|----------------------------------|---|---|--------------|--|
| g/cm ³ | lb/cub in | | | | +100 °C | +400 °C | |
| 8.90 | 0.32 | 1,083 | 0.38 | 390.00 | 17.50 | 18.50 | 0.00 |

Mechanical Properties at +20 °C in Annealed Condition

| Tensile Strength ²⁾ | | Elongation (L ₀ = 100 mm) % at nominal diameter in mm | | | | |
|--------------------------------|---------------|--|------------------|-----------------|----------------|-------------|
| MPa | psi | 0.020 to 0.063 | > 0.063 to 0.125 | > 0.125 to 0.50 | > 0.50 to 1.00 | > 1.00 |
| 200 | 29,000 | ≈ 10 | ≈ 15 | ≈ 20 | ≥ 25 | ≥ 30 |

General Note // E-COPPER is not a standard resistance alloy.

Therefore no resistance values are quoted. The weight values correspond to those of ISOTAN[®] wires of the same diameter.

1) The resistivity at 0 °C is 1.56 μΩ x cm.

2) This value applies to wires of 2.0 mm diameter. For thinner wires the minimum values will substantially increase, depending on the dimensions.