

Alloy 10X - CuCoBeZr

Materion's Alloy 10X is a copper-cobalt-beryllium-zirconium alloy developed for improved high temperature strength and ductility. Most high strength copper alloys lose significant strength and ductility at elevated temperature. Alloy 10X retains good strength and ductility at temperatures up to 800 °F/430 °C. With its combination of good elevated temperature strength and conductivity, it has superior resistance to thermal cracking. It is the copper alloy of choice for operation above 575 °F/300 °C where high strength is required.

CHEMICAL COMPOSITION (weight percent)

Alloy	Cobalt	Beryllium	Zirconium	Copper
10X	2.0 – 2.7	0.4 – 0.7	0.12 – 0.4	Balance

PHYSICAL PROPERTIES

Elastic Modulus	Melting Point (Solidus)	Electrical Conductivity/ Resistivity	Density	Thermal Expansion Coefficient	Thermal Conductivity (25 °C)	Heat Capacity (25 °C)
20,000 ksi 138 GPa	~1850 °F ~1010 °C	45-55% IACS 26 – 32 MS/m	0.319 lb/in ³ 8.83 g/cm ³	9.8x10 ⁻⁶ °F ⁻¹ 17.6x10 ⁻⁶ °C ⁻¹	130 BTU/ft•hr•°F 225 W/m•°C	.099 BTU/lb•°F 0.414 J/g•K

MECHANICAL PROPERTIES

Temper †	Minimum 0.2% Offset Yield Strength @ 20°C	Minimum Ultimate Strength @ 20°C	Minimum Elongation @ 20°C	Minimum Hardness @ 20°C	Typical 0.2% Offset Yield Strength @ 427°C	Typical Ultimate Strength @ 427°C	Typical Elongation @ 427°C
TH04 (Φ < 75mm)	85 ksi 585 MPa	100 ksi 690 MPa	15%	92HRB	65 ksi 450 MPa	75ksi 515 MPa	5%

† Temper TF00 also available. Mechanical strength is approximately 10% lower.

FORMS AVAILABLE

Rounds, square and rectangular bars with < 75mm section thickness available in TH04 temper. Tube in the TH04 temper is available in 0.375" to 3" (9.5 mm to 76 mm) outside diameters. Wall thickness is typically 10 to 20% of the outside diameter, subject to certain maximum and minimum constraints. Thicker sections and larger diameters available in TF00 temper.

SPECIFICATIONS AND STANDARDS

ASTM B441 (C17500), RWMA Class 3

ADDITIONAL INFORMATION

Additional technical information on Alloy 10X may be obtained by phoning the Customer Technical Service Department at 800-375-4205. For pricing and availability, phone 800-521-8800, or the local sales number listed on the bottom of the next page.

HEALTH & SAFETY

Handling copper beryllium in solid form poses no special health risk. Like many industrial materials, beryllium-containing materials may pose a health risk if recommended safe handling practices are not followed. Inhalation of airborne beryllium may cause a serious lung disorder in susceptible individuals. The Occupational Safety and Health Administration (OSHA) has set mandatory limits on occupational respiratory exposures. Read and follow the guidance in the Safety Data Sheet (SDS) before working with this material. For additional information on safe handling practices or technical data on copper beryllium, contact Materion Performance Alloys, Technical Service Department at 800-375-4205.

North American Service Centers – Sales Inquiries

For bar, tube, plate/sheet >0.060” (1.5 mm) thick and rod >0.5” (12.7 mm) diameter:

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