

Alloy 390E Strip

Materion Alloy 390E is a copper beryllium alloy that provides a unique combination of high strength, high electrical conductivity, and excellent formability. Copper beryllium alloys are well known for their superior stress relaxation resistance and fatigue strength. This blend of properties provides engineers the flexibility to design small form factor signal and power interconnects that can be used in harsh environments.

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	1885 °F 1029 °C	42% IACS min. 3.74 μΩ-cm max.	0.319 lbs/in ³ 8.83 g/cm ³	9.8 x 10 ⁻⁶ in/in °F 17.6 x 10 ⁻⁶ m/m °C	120 BTU/ft hr °F 208 W/m °C	0.1 BTU/ lb /°F 419 J/kg °C

TYPICAL MECHANICAL PROPERTIES

Temper	0.2% Offset Yield Strength (min)		Ultimate Tensile Strength (min)		Elongation (min)*	Hardness
	(ksi)	(MPa)	(ksi)	(MPa)		
EHT	138	951	143	986	2	300

*Percent elongation valid only for strip 0.004" (0.10 mm) and thicker per ASTM E-8.

Formability (90° Bend)			Nominal Fatigue Strength 107 Cycle R=0		**1000 Hour Stress Relaxation Resistance	
Strip Thickness	L	T	ksi	MPa	150°C	200°C
≤ 0.002" (< 0.05 mm)	1.0	1.0	80	552	85%	69%
≤ 0.004" (< 0.10 mm)	2.0	2.5				
≤ 0.006" (< 0.15 mm)	2.5	3.5				
≤ 0.008" (< 0.20 mm)	3.5	3.5				

**Stress Remaining after 1000 hours exposure. Initial stress = 75% of the 0.2% offset yield strength.

FORMS AVAILABLE:

Alloy 390E strip is available in widths ranging from 0.050" to 16" (1.27 mm to 406.5 mm), minimum thickness of 0.00197" (0.05 mm), maximum thickness of 0.015" (0.381mm) Thinner gauges maybe available upon request, please contact your local Materion sales office for more information.

RELATED INFORMATION:

Additional technical information on Alloy 390E strip may be obtained by phoning 800-375-4205. For pricing and availability, phone 800-323-2438, or the local sales number listed on the back of this datasheet.

HEALTH AND SAFETY

Processing beryllium-containing alloys poses a health risk if safe practices are not followed. Inhalation of airborne beryllium can cause serious lung diseases in some individuals. Occupational safety and health regulatory agencies worldwide have set mandatory limits on occupational respiratory exposures. Read and follow the guidance in the Safety Data Sheet (SDS) before working with this material. The SDS and additional important beryllium health and safety information and guidance can be found at berylliumsafety.com, berylliumsafety.eu and Materion.com. For questions on safe practices for beryllium-containing alloys, contact the Materion Product Stewardship Group at +1.800.862.4118 or contact us by e mail at Materion-PS@Materion.com.

TOLERANCES

Strip Thickness (inches)		Standard Thickness Tolerance (inches)	Strip Thickness (mm)		Standard Thickness Tolerance (mm)
Over	Including	Plus or Minus	Over	Including	Plus or Minus
	0.0020	0.00010		0.05	0.003
0.0020	0.0040	0.00015	0.05	0.10	0.004
0.0040	0.0060	0.00020	0.10	0.15	0.005
0.0060	0.0090	0.00025	0.15	0.20	0.006
0.0090	0.0130	0.00030	0.20	0.30	0.008
0.0130	0.0260	0.00040	0.30	0.70	0.010
0.0260	0.0370	0.00060	0.70	1.00	0.015
0.0370	0.0500	0.00080	1.00	1.30	0.020
0.0500	0.0750	0.00100	1.30	2.00	0.025

Additional tolerances are per ASTM B 194. Please specify the exact tolerances that you require when you place your order. Tighter tolerances may be available at additional cost. Please contact your local sales engineer to confirm the requested capability.

North American Service Centers – Sales Inquiries

For strip ≤ 0.060 " (1.5 mm) thick.
wire and rod ≤ 0.5 " (12.7 mm) diameter:

Elmhurst, IL
TOLL FREE: 800-323-2438
LOCAL: +(1) 630-832-9650
FAX: +(1) 630-832-9657

Disclaimer:

Only the buyer can determine the appropriateness of any processing practice, end-product or application. Materion does not make any warranty regarding its recommendations, the suitability of Materion's product, or its processing suggestions for buyer's end product, application or equipment.

The properties presented on this data sheet are for reference purposes only, intended only to initiate the material selection process. They do not constitute, nor are they intended to constitute, a material specification. Material will be produced to one of the applicable industry standards, if any, listed in the Industry Standards and Specification section.

Actual properties may vary by thickness and/or part number. Please contact your local sales engineer for detailed properties to be used in simulation.

Any properties marked as preliminary are subject to change at any time as the manufacturing process is further refined.