

## Alloy 390E Strip

Materion Performance Alloys' 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 <sup>3</sup> 8.83 g/cm <sup>3</sup>	9.8x10 <sup>-6</sup> in/in °F 17.6x10 <sup>-6</sup> 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 (min)
	ksi	MPa	ksi	MPa	%	DPH
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 10 <sup>7</sup> 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" (0.381 mm) 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.

### SAFE HANDLING OF COPPER BERYLLIUM ALLOYS

Handling copper beryllium alloys 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 Customer Technical Service Department at 800-375-4205.

## 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  
PHONE: +(1) 630-832-9650  
FAX: +(1) 630-832-9657

### International Sales Offices

#### CHINA/HONG KONG

TEL: + (852) 2318-1960 / 1907  
[brushalloysHK-info@materion.com](mailto:brushalloysHK-info@materion.com)

#### CHINA/SHANGHAI

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