MATERION

Data Sheet

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 with the flexibility to design small form factor signal and power interconnects that can be used in harsh environments.

Typical Physical Properties

Elastic Modulus	Melting Point (Solidus)	Electrical Conductivity Resistivity	Density	Thermal Expansion Coefficient (20 to 200 °C)	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 lb/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	(%)	DPH/HV
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 10^7 Cycle R=0		**1000 Hour Stress Relaxation Resistance	
Strip Thickness	L	T	Ksi	MPa	150°C	200°C
≤ 0.002" (< 0.05 mm) ≤ 0.004" (< 0.10 mm) ≤0.006" (< 0.15 mm) ≤0.008" (< 0.20 mm)	1.0 2.0 2.5 3.5	1.0 2.5 3.5 3.5	80	552	85%	69%

**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 may be 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 +1.800.375.4205.

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 B248. 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.

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 email at Materion-PS@Materion.com.

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