

Alloy 390[®] Strip

Materion Performance Alloys' mill hardened Alloy 390 strip provides a unique combination of high strength and high electrical conductivity, coupled with good resistance to stress relaxation. This combination allows for high reliability, small form factor contacts. Typical applications include power contacts and burn-in and test socket contacts.



CHEMICAL COMPOSITION (weight percent)

Beryllium (Be)	Nickel (Ni)	Copper
0.15 – 0.5	1.0 – 1.4	Balance

PHYSICAL PROPERTIES

Elastic Modulus	Density	Melting Point (Solidus)	Electrical Conductivity	Thermal Conductivity	Coefficient of Thermal Expansion
20,000 ksi 138 GPa	0.318 lb/in ³ 8.81 g/cm ³	1880°F 1030°C	44% IACS (nominal) 3.92 μ-ohm-cm (nominal)	128 BTU/hr ft ·°F 221 W/m ·°C	9.8 x 10 ⁻⁶ in/in ·°F 17.6 x 10 ⁻⁶ mm/mm ·°C

TYPICAL MECHANICAL PROPERTIES*

Temper	0.2% Offset Yield Strength		Ultimate Tensile Strength		Elongation in 2" **	Hardness
	ksi	MPa	ksi	MPa		
HT (TH04)	135 – 153	930 – 1055	138 – 158	950 – 1090	1% minimum	280 - 340

*Properties may vary by thickness.

** Percent elongation valid for strip 0.004" (0.10 mm) and thicker.

Formability (Minimum Bend Radius to Thickness Ratio for a 90 Degree Bend)			10 ⁸ Cycle R=0 (Unidirectional) Fatigue Strength		10 ⁸ Cycle R=-1 (Fully Reversed) Fatigue Strength		1000 Hour Stress Relaxation Resistance***	
Strip Thickness	L	T	ksi	MPa	ksi	MPa	150°C	200°C
≤ 0.004" (0.10 mm)	2.0	2.0	84 – 99	580 – 685	30 – 40	205 – 275	85%	69%
> 0.004" (0.10 mm)	5.0	5.0						

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

STANDARD AVAILABILITY

Alloy 390 strip is available in widths ranging from 0.050" to 16" (1.27 mm to 406.5 mm) and in thicknesses ranging from 0.002" to 0.015" (0.05 mm to 0.38 mm).

SPECIFICATIONS AND STANDARDS

UNS C17460

RELATED INFORMATION

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

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.

SAFE HANDLING OF COPPER BERYLLIUM

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 1-800-375-4205.

North American Service Centers – Sales Inquiries

For strip $\leq 0.060''$ (1.5 mm) thick.
wire and rod $\leq 0.5''$ (12.7 mm) diameter:

Elmhurst, IL

TOLL FREE: 800-323-2438

PHONE: +(1) 630-832-9650

FAX: +(1) 630-832-9657

International Sales Offices

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MATERION CORPORATION

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AD0032_0817

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