

## Alloy 390® Strip

Materion's mill-hardened Alloy 390 strip provides a unique combination of high strength and high electrical conductivity, coupled with excellent resistance to stress relaxation. These attributes allow 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 (Cu)
0.15 - 0.5	1.0 - 1.4	Balance

### Typical Physical Properties

Elastic Modulus	Density	Melting Point (Solidus)	Electrical Conductivity Resistivity	Thermal Conductivity (25°C)	Thermal Expansion Coefficient (20 to 200° C)
20,000 ksi 138 GPa	0.318 lb/in <sup>3</sup> 8.81 g/cm <sup>3</sup>	1880°F 1030°C	44% IACS (nominal) 3.92 μ-ohm-cm (nominal)	128 BTU/hr·fr·°F 221 W/m·°C	9.8 x 10 <sup>-6</sup> in/in·°F 17.6 x 10 <sup>-6</sup> mm/mm·°C

### Typical Mechanical Properties\*

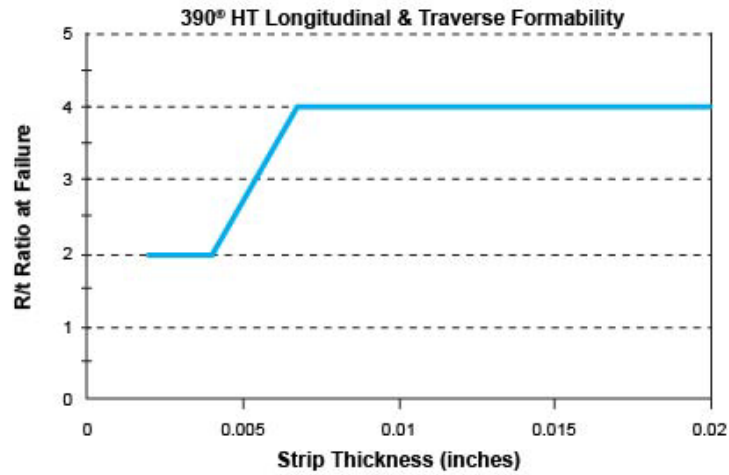
Temper	0.2% Offset Yield Strength		Ultimate Tensile Strength		Elongation in 2''**	Hardness
	ksi	MPa	ksi	MPa		DPH/HV
HT (TH04)	135 - 153	930 - 1055	138 - 158	950 - 1090	1% minimum	280 - 340

\*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 <sup>8</sup> Cycle R=0 (Unidirectional) Fatigue Strength		10 <sup>8</sup> 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.



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).

## Industry Standards & Specifications

UNS# C17460

## Related Information

Additional technical information on Alloy 390 Strip can be obtained by calling +1.800.375.4205. For pricing and availability, phone +1.800.521.8800.

## 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](http://berylliumsafety.com), [berylliumsafety.eu](http://berylliumsafety.eu) and [Materion.com](http://Materion.com). For questions on safe practices for beryllium-containing alloys, contact the Materion Product Stewardship Group at +1.800.862.4118 or by email at [Materion-PS@Materion.com](mailto:Materion-PS@Materion.com).

### 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.