

## Alloy 390<sup>®</sup> Strip

Materion Brush 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 alloys 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 <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 ft °F 225 W/m ·K	9.8 × 10 <sup>-6</sup> in/in ·°F 17.5 × 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		
HT (TH04)	135 – 153	950 – 1090	138 – 158	930 – 1055	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.

## STANDARD AVAILABILITY

Alloy 390 strip is available in widths ranging from 0.050" to 16" (1.27 mm to 452.7 mm) and in thicknesses ranging from 0.002" to 0.015" (0.05 mm to 0.38 mm).

## SPECIFICATIONS

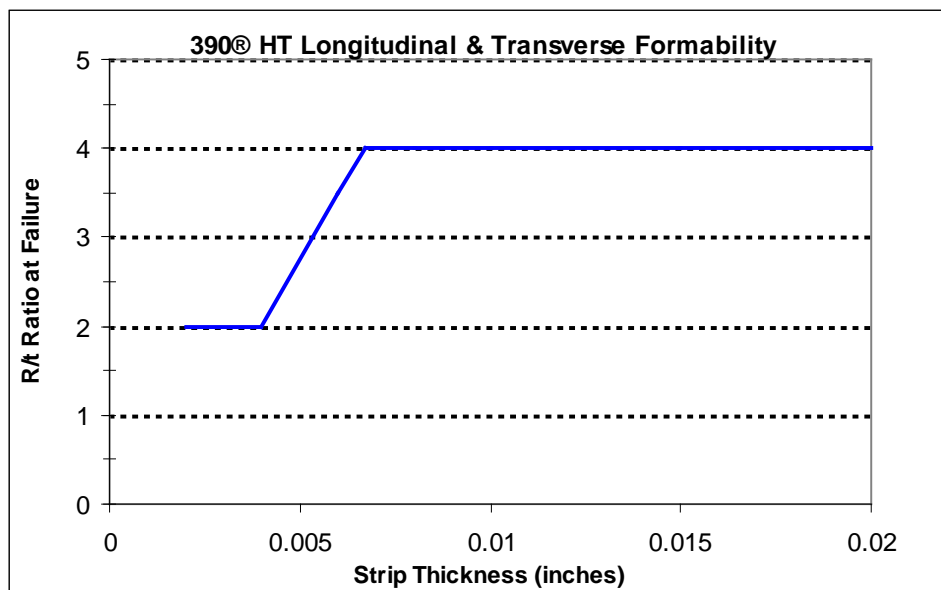
UNS C17460

## RELATED INFORMATION

Additional information on Brush Alloy 310 can be obtained by calling 800-375-4205.

## 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 Material Safety Data Sheet (MSDS) before working with this material. For additional information on safe handling practices or technical data on copper beryllium, contact Materion Brush Performance Alloys, Technical Service Department at 1-800-375-4205.



### North American Service Centers – Sales Inquiries

For strip, wire and rod under 0.4" (10 mm) diameter  
**Elmhurst, IL**  
TOLL FREE: 800.323.2438  
LOCAL: +(1) 630.832.9650  
FAX: +(1) 630.832.9657

For plate, tube, bar, and rod 0.4" (10 mm) diameter and over  
**Warren, MI**  
TOLL FREE: 800.521.8800  
LOCAL: +(1) 586.772.2700  
FAX: +(1) 586.772.2472

### International Sales Offices

**CHINA/HONG KONG**  
TEL: +852.2318.1960/1907  
[brushalloysHK-info@materion.com](mailto:brushalloysHK-info@materion.com)

**CHINA/SHANGHAI**  
TEL: +(86) 21.5237.2328  
[brushalloysCN-info@materion.com](mailto:brushalloysCN-info@materion.com)

**GERMANY**  
TEL: +(49) 711.830.930  
[brushalloysDE-info@materion.com](mailto:brushalloysDE-info@materion.com)

**INDIA/PUNE**  
TEL: +(91) 99606.33744  
[brushalloysIN-info@materion.com](mailto:brushalloysIN-info@materion.com)

**JAPAN**  
TEL: +(81) 33.230.2961  
[brushalloysJP-info@materion.com](mailto:brushalloysJP-info@materion.com)

**REPUBLIC OF KOREA**  
TEL: +(82) 32.811.2171  
[brushalloysKR-info@materion.com](mailto:brushalloysKR-info@materion.com)

**SINGAPORE/ASEAN**  
TEL: +(65) 6842.4456  
[brushalloysSG-info@materion.com](mailto:brushalloysSG-info@materion.com)

**TAIWAN, R.O.C.**  
TEL: +(886) 2.2747.8800x121  
[brushalloysTW-info@materion.com](mailto:brushalloysTW-info@materion.com)

**UNITED KINGDOM @ IRELAND**  
TEL: +(44) 118.930.3733  
[brushalloysUK-info@materion.com](mailto:brushalloysUK-info@materion.com)

To obtain a complete list of Materion's global distributor/agent network, visit us online at [www.materion.com/BrushAlloys/ContactUs](http://www.materion.com/BrushAlloys/ContactUs).

**Materion Brush Performance Alloys**  
6070 Parkland Boulevard  
Mayfield Heights, OH 44124 USA  
phone: 216.486.4200 fax: 216.383.4005  
email: [BrushAlloys-info@materion.com](mailto:BrushAlloys-info@materion.com)

**MATERION CORPORATION**  
[www.materion.com/alloys](http://www.materion.com/alloys)

**AD0032\_0311**  
Alloy 390® is a Registered Trademark of Materion Brush Inc.  
© 2011 Materion Brush Inc.