Alloy 174 (C17410) Strip

Materion Alloy 174 strip is a mill hardened copper beryllium strip alloy designed for use in the automotive, appliance, and telecom markets. It provides high yield and fatigue strength with exceptional electrical conductivity and good resistance to stress relaxation. Typical applications include high reliability automotive terminals and spring contacts for switches and relays.

Chemical Composition (Weight Percent)

Alloy	Beryllium	Cobalt	Copper
C17410	0.15 - 0.50	0.35 - 0.60	Balance

Typical Physical Properties

Elastic Modulus	Melting Point (Solidus)	Electrical Conductivity/ Resistivity	Density**	Thermal Expansion Coefficient (20 to 200 °C)	Thermal Conductivity (25 °C)
20,000 ksi	1880 °F	45-60% IACS	0.318 lb/in^3	9.8 x 10^{-6} in/in °F	135 BTU/ft hr °F
138 GPa	1020 °C	2.9-3.8 μΩ-cm	8.80 g/cm^3	17.6 x 10^{-6} m/m °C	230 W/ m K

Typical Mechanical Properties*

| Temper	0.2% Offset Yield Strength (min)		Ultimate Tensile Strength (min)		Elongation (min)**	Hardness	Formability (Minimum Bend Radius to Thickness Ratio for a 90° Bend)***	
	ksi	MPa	ksi	MPa	Percent	DPH	Longitudinal	Transverse
½ HT (TH02)	80 - 100	550 - 690	95 - 115	655 - 790	10 - 20	180 - 230	0.5	0.5
HT (TH04)	100 - 120	690 - 830	110 - 130	760 - 895	7 - 17	210 - 278	1.2	5.0

*Properties may vary by thickness.
**Percent elongation numbers are valid only for strip thicker than 0.004" (0.10 mm).
***Formability numbers valid for strip 0.010" (0.25 mm) and thinner.

Temper	10^8 Cycle R=0 (Unidirectional) Fatigue Strength		10^8 Cycle R=-1 (Fully Reversed) Fatigue Strength		1000 Hour Stress Relaxation Resistance****		
	ksi	MPa	ksi	MPa	100 °C	150 °C	200 °C
½ HT (TH02)	75 - 85	515 - 585	35 - 45	240 - 310	94%	82%	64%
HT (TH04)	85 - 95	585 - 655	55 - 65	380 - 450	95%	85%	77%

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

Alloy 174 Formability
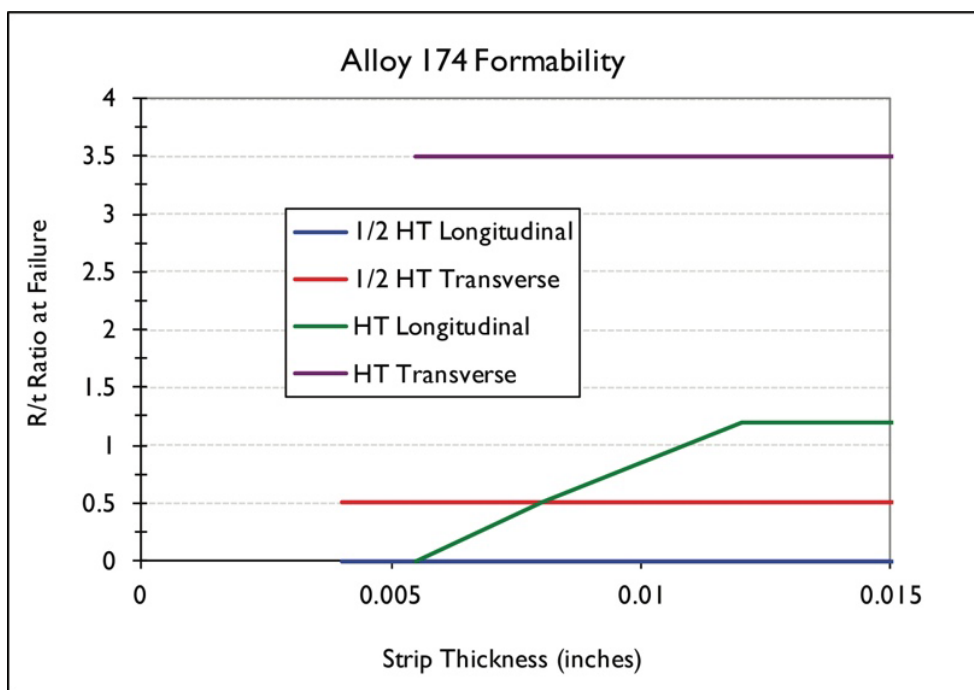
Forms Available

Alloy 174 mill hardened 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 0.0787" (0.05 mm to 2.00 mm).

Industry Standards and Specifications

UNS# C17410, ASTM B-768

Related Information

Additional technical information on Alloy 174 strip may be obtained by phoning +1800.375.4205. For pricing and availability, phone +1.800.521.8800.

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.