

## Alloy I90 (C17200) Strip

Materion Performance Alloys' Alloy I90 strip provides the highest strength of any mill hard copper alloy, with electrical conductivity considerably greater than other high strength copper alloys. This alloy features good stress relaxation resistance and high fatigue strength. Typical applications include high reliability spring contacts for switches and relays, battery contacts, and automotive terminals.



### CHEMICAL COMPOSITION (weight percent)

Alloy	Beryllium	Nickel + Cobalt	Nickel + Cobalt + Iron	Copper
C17200	1.80 – 2.00	0.2 min.	0.6 max.	Balance

### PHYSICAL PROPERTIES\*

Elastic Modulus	Melting Point (Solidus)	Electrical Conductivity/ Resistivity	Density**	Thermal Expansion Coefficient	Thermal Conductivity (25 °C)
19,000 ksi 131 GPa	1600°F 870 °C	17-28% IACS 6.2-10.1 μΩ-cm	0.302 lb/in <sup>3</sup> 8.36 g/cm <sup>3</sup>	9.7x10 <sup>-6</sup> in/in °F 17.5x10 <sup>-6</sup> m/m °C	60 BTU/ft hr °F 105 W/ m K

\*Properties specified for the precipitation age hardened (heat treated) condition

### MECHANICAL PROPERTIES\*

Temper**	0.2% Offset Yield Strength		Ultimate Tensile Strength		Elongation ***	Hardness	Formability (Minimum Bend Radius to Thickness Ratio for a 90° Bend)****	
	ksi	MPa	ksi	MPa			Percent	DPH
AM (TM00)	70-95	480-660	100-110	690-760	16-30	210-251	0.0	0.0
¼ HM (TM01)	80-110	550-760	110-120	750-830	15-25	230-271	0.5	0.5
½ HM (TM02)	95-125	650-870	120-135	820-930	12-22	250-301	0.5	1.0
HM (TM04)	110-135	750-930	135-150	930-1040	9-20	285-343	2.0	2.0
SHM (TM05)	125-140	860-970	150-160	1030-1110	9-18	309-363	2.8	3.2
XHM (TM06)	135-170	930-1180	155-175	1060-1210	4-15	317-378	4.0	5.0
XHMS (TM08)	150-180	1030-1250	175-190	1200-1320	3-12	325-413	5.0	10.0

\*\*Properties may vary by thickness. \*\*\*Percent Elongation valid only for strip 0.004" (0.10 mm) and thicker

\*\*\*\*Formability numbers valid for strip 0.010" (0.25 mm) and thinner.

### FORMS AVAILABLE

Alloy I90 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 0.063" (0.05 mm to 1.61 mm). Thicker gauges may be produced at substantially reduced formability.

### SPECIFICATIONS AND STANDARDS

C17200, ASTM B-194, NACE MRO175/ISO 15156, JIS H3130, EN 1654, EN 13148, EN 14436

**RELATED INFORMATION** Additional technical information on Alloy I90 strip may be obtained by phoning 800-375-4205. For pricing and availability, phone 800-323-2438, or the local sales number listed on the back of this datasheet.

## 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 ≤0.060" (1.5 mm) thick, wire and rod ≤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

### CHINA/HONG KONG

TEL: + (852) 2318-1960 / 1907  
[brushalloysHK-info@materion.com](mailto:brushalloysHK-info@materion.com)

### JAPAN

TEL: + (81) 33 230 2961  
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### TAIWAN, R.O.C.

TEL: + (886) 2-2747-8800 x-121  
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