

Alloy 290 (C17200) Strip

Materion Performance Alloys' Alloy 290 strip provides the highest strength of any mill hardened 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 battery contacts, audio jack contacts, and board to board contacts.



CHEMICAL COMPOSITION (weight percent)

| Alloy | Beryllium | Nickel + Cobalt | Nickel + Cobalt + Iron | Copper |
|--------|-----------|-----------------|------------------------|---------|
| C17200 | 1.8 – 2.0 | 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 ³ 8.36 g/cm ³ | 9.7×10 ⁻⁶ in/in °F 17.5×10 ⁻⁶ 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 *** | Formability (Minimum Bend Radius to Thickness Ratio for a 90° Bend) **** | |
|--------|----------------------------|-----------|---------------------------|-----------|----------------|--|------------|
| | ksi | MPa | ksi | MPa | | Longitudinal | Transverse |
| TM02 | 95-115 | 655-800 | 120 min. | 820 min. | 14 min. | 0.0 | 0.0 |
| TM03 | 110-125 | 760-860 | 135 min. | 930 min. | 12 min. | 0.5 | 0.5 |
| TM04 | 115-135 | 790-930 | 140 min. | 960 min. | 9 min. | 0.7 | 0.7 |
| TM06 | 135-155 | 930-1070 | 155 min. | 1060 min. | 6 min. | 1.5 | 1.5 |
| TM08 | 155-175 | 1060-1210 | 175 min. | 1200 min. | 3 min. | 3.5 | 3.0 |

Properties may vary by thickness. *Percent elongation numbers are valid for strip 0.004" (0.10 mm) and thicker.

****Formability numbers valid for strip 0.00787" (0.20 mm) and thinner.

FORMS AVAILABLE

Alloy 290 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 0.035" (0.05 mm to 0.9 mm).

SPECIFICATIONS AND STANDARDS

C17200, ASTM B-194, NACE MRO175/ISO 15156

RELATED INFORMATION

Additional technical information on Alloy 290 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 reverse side of this sheet.

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
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International Sales Offices

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