

EtchMet Alloy TM10 Strip

EtchMet® alloy from Materion is tailor-made for the springs in voice coil motors and optical image stabilization systems common in smart phone cameras. These devices have a relatively large mass (lense) suspended by extremely small, thin springs. The small size of the springs requires very high strength material to withstand shock loads when the phone is dropped or deliberately tapped against an NFC reader. Therefore, the springs must be made from a very robust material. Furthermore, the lack of a damping mechanism makes high spring stiffness important to combat vibration.

EtchMet alloy provides several advantages that make it the ideal material for this application:

- It has a uniform elastic modulus across all thicknesses/diameters and product forms. This provides consistent stiffness and damping behavior which makes spring calculations easy.
- It has a very high resilience, allowing it to withstand impact loads without fracturing or permanently deforming.
- It has high fatigue strength to withstand many drops and actuation cycles.
- It has a uniform, primarily single-phase microstructure, which photochemically machines easily and cleanly for uniform edges free of stress risers.
- It is supplied fully precipitation hardened so no further heat treatment is required.
- It solders and welds readily.
- EtchMet strip is inherently flat with minimal coil set, which helps with alignment during photochemical machining.

Physical Properties*

Elastic Modulus	Electrical Conductivity/Resistivity	Density**	Thermal Expansion Coefficient	Thermal Conductivity (25 °C)	Relative Magnetic Permeability
19,000 ksi 131 GPa	17 - 28% IACS 6.2 - 10.1 μΩ-cm	0.302 lb/in ³ 8.36 g/cm ³	9.7 x 10 ⁻⁶ in/in °F 17.5 x 10 ⁻⁶ m/m °C	60 BTU/ft hr °F 105 W/ m K	< 1.001

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

**Value listed is the density after heat treatment. The density before heat treatment is 0.30 lb/in³ (8.30 g/cm³).

Mechanical Properties*

Temper*	0.2% Offset Yield Strength		Ultimate Tensile Strength		Elongation**	Hardness
	ksi	MPa	ksi	MPa	Percent	DPH
EtchMet TM10	160 min.	1103 min.	175 min.	1200 min.	2 min.	325 min.

*Properties may vary by thickness.

**Reference only: percent elongation is valid only for strip 0.004" (0.10 mm) and thicker.

Forms Available

EtchMet alloy TM10 strip is available in widths ranging from 0.050" to 16" (1.27 mm to 406.5 mm) and in thicknesses ranging from 0.001" to 0.002" (0.025 mm to 0.05 mm). Thicker gauges may be produced if required. EtchMet alloy is also available in thin gauge wire form.

Related Information

Additional technical information on EtchMet TM10 strip may 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

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, 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 by email at 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.