



Selecting the Mineral Insulated Thermocouple Cable Suited to Your Requirement

Tempco offers a wide variety of sheathed, mineral insulated thermocouple cable. We stock many varieties of sheath diameters and materials in ANSI recognized thermocouple types and can manufacture a multitude of non-stock combinations of sheath materials, O.D.s, insulations, wire types and wire configurations on special request. Consult Tempco with your specific requirements.

When selecting a cable for an application there are four things that must be considered:

Sheath Material

The outer sheath protects the insulation and wires from physical damage, contamination and the environment, all of which affect the service life and cost. As there isn't any one particular sheath material that is appropriate for all conditions, Tempco offers you a choice.

Wire Types (Calibration)

Selecting the proper conductors can be crucial to the function the MI cable is to perform. Where thermocouple cable is concerned, selecting the appropriate calibration for the temperature to be measured, the instrumentation available, and the environment will be a significant factor in the accuracy, life and cost.

Insulation Material

The insulation material isolates the wires from each other and the sheath. Because the wires are used as conductors, the insulating material becomes important in preventing electrical shorts and dielectric breakdown, particularly at elevated temperatures.

Physical Parameters

The four main physical characteristics of the MI cable that should be taken into account are:

- a. Sheath Diameter
- b. Sheath Wall Thickness
- c. Conductor Size
- d. Conductor Location (4 and 6 wires)

These will directly affect service life, flexibility, time response, weldability, strength and cost.

The following pages will serve as a guide for sheath materials, insulation materials and the various ANSI thermocouple calibrations.



The following information is designed to be used as a guide and may not be correct in every application. If in doubt, consult with your Tempco sales engineer or the factory. Temperatures shown are maximum recommended operating temperatures.

Sheath Material

NOTE: Letters in parentheses following the sheath material are used with the Ordering Worksheet on page 14-119.

Alloy 600 (A)

Maximum temperature: 1177°C (2150°F). Most widely used thermocouple sheath material. Good high temperature strength, corrosion resistance, resistance to chloride-ion stress corrosion cracking and oxidation resistance to high temperatures. Do not use in sulfur-bearing environments. Good in nitriding environments.

316 SS (C)

Maximum temperature: 900°C (1650°F). Best corrosion resistance of the austenitic stainless steel grades. Good corrosion resistance in H₂S. Widely used in the food and chemical industry. Subject to damaging carbide precipitation in 482° to 871°C (900° to 1600°F) range.

304 SS (B)

Maximum temperature: 900°C (1650°F). Most widely used low temperature sheath material. Extensively used in food, beverage, chemical and other industries where corrosion resistance is required. Subject to damaging carbide precipitation in 482° to 871°C (900° to 1600°F) range. Lowest-cost corrosion resistant sheath material available.

304L (D)

Maximum temperature: 900°C (1650°F). Low-carbon version of 304 SS (B). Low carbon content allows this material to be welded and heated in the 482° to 871°C (900° to 1600°F) range without damage to corrosion resistance.

316L (E)

Maximum temperature: 900°C (1650°F). Same as 316 SS (C) except low-carbon version allows for better welding and fabrication.

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