



Standard Specification for Compacted Mineral-Insulated, Metal-Sheathed Cable Used in Industrial Resistance Thermometers¹

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1. Scope

1.1 This specification covers the requirements for compacted, mineral-insulated, metal-sheathed (MIMS) cables used to manufacture metal-sheathed, industrial resistance thermometers referred to in this document as Resistance Temperature Detectors or RTDs.

1.2 The materials of construction include copper, nickel-clad copper, copper-45 % nickel (constantan), or nickel conductors, an austenitic stainless steel or nickel-chromium alloy sheath, and either magnesia (MgO) or alumina (Al₂O₃) insulation.

1.3 The cable diameter is between 0.093 and 0.500 in. (2.33 and 12.70 mm) and contains between two and eight conductors, set in various design configurations and wire spacings.

1.4 The values of temperature in this specification are based on the International Temperature Scale of 1990 (ITS-90).

1.5 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.6 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 The latest issues of the following documents form a part of this specification to the extent specified herein. In the event of a conflict between this specification and other specifications referenced herein, this specification shall take precedence.

2.2 Due to the similarity between Compacted MIMS Thermocouple Cable and Compacted MIMS Cable, some Thermocouple ASTM Standards may apply.

2.3 ASTM Standards:²

A213/A213M Specification for Seamless Ferritic and Austenitic Alloy-Steel Boiler, Superheater, and Heat-Exchanger Tubes

A249/A249M Specification for Welded Austenitic Steel Boiler, Superheater, Heat-Exchanger, and Condenser Tubes

A269 Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service

A632 Specification for Seamless and Welded Austenitic Stainless Steel Tubing (Small-Diameter) for General Service

B163 Specification for Seamless Nickel and Nickel Alloy Condenser and Heat-Exchanger Tubes

B167 Specification for Nickel-Chromium-Iron Alloys (UNS N06600, N06601, N06603, N06690, N06693, N06025, N06045, and N06696), Nickel-Chromium-Cobalt-Molybdenum Alloy (UNS N06617), and Nickel-Iron-Chromium-Tungsten Alloy (UNS N06674) Seamless Pipe and Tube

B516 Specification for Welded Nickel-Chromium-Iron Alloy (UNS N06600, UNS N06603, UNS N06025, and UNS N06045) Tubes

E344 Terminology Relating to Thermometry and Hydrometry

E780 Test Method for Measuring the Insulation Resistance of Mineral-Insulated, Metal-Sheathed Thermocouples and Thermocouple Cable at Room Temperature

E839 Test Methods for Sheathed Thermocouples and Sheathed Thermocouple Cable

E1137/E1137M Specification for Industrial Platinum Resistance Thermometers

E1652 Specification for Magnesium Oxide and Aluminum Oxide Powder and Crushable Insulators Used in the Manufacture of Base Metal Thermocouples, Metal-Sheathed Platinum Resistance Thermometers, and Noble Metal Thermocouples

¹ This specification is under the jurisdiction of ASTM Committee E20 on Temperature Measurement and is the direct responsibility of Subcommittee E20.03 on Resistance Thermometers.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.