



Standard Specification for Mineral-Insulated, Metal-Sheathed Base Metal Thermocouples¹

This standard is issued under the fixed designation E608/E608M; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification covers the requirements for mineral-insulated, metal-sheathed base metal thermocouples for industrial or high-reliability applications. It applies specifically to thermocouples fabricated from sheathed thermocouple material in accordance with Specification E585/E585M. The specification provides for the selection of thermoelements, insulation, sheath material, measuring junction configuration, thermocouple assembly length, and the type of transition or termination.

1.2 This specification also includes provisions for either quality assurance or verification program requirements, or both, as a purchaser's option.

1.3 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

1.4 *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 ASTM Standards:²

E165 Practice for Liquid Penetrant Examination for General Industry

E220 Test Method for Calibration of Thermocouples By Comparison Techniques

E230 Specification and Temperature-Electromotive Force (EMF) Tables for Standardized Thermocouples

E344 Terminology Relating to Thermometry and Hydrometry

E585/E585M Specification for Compacted Mineral-Insulated, Metal-Sheathed, Base Metal Thermocouple Cable

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

2.2 AWS Standards:³

A5.9 Specification for Corrosion-Resisting Chromium and Chromium-Nickel Steel Welding Rods and Bare Electrodes

A5.14 Specification for Nickel and Nickel-Alloy Bare Welding Rods and Electrodes

3. Terminology

3.1 *Definitions*—The definitions given in Terminology E344 shall apply to this specification.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *common ungrounded junction, n*—measuring junctions within the same multi-pair thermocouple that are electrically isolated from the sheath but electrically connected to each other.

3.2.2 *isolated ungrounded junction, n*—measuring junctions within the same multi-pair thermocouple that are electrically isolated from the sheath and electrically isolated from each other.

3.2.3 *lot, n*—a quantity of thermocouples manufactured from the same continuous length of mineral-insulated, metal-sheathed thermocouple cable.

3.2.4 *sheathed thermocouple material, n*—a combination of two or more continuous thermoelements embedded in ceramic insulation compacted within a metal protecting sheath.

¹ This specification is under the jurisdiction of ASTM Committee E20 on Temperature Measurement and is the direct responsibility of Subcommittee E20.04 on Thermocouples.

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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.

³ Available from American Welding Society (AWS), 550 NW LeJeune Rd., Miami, FL 33126, <http://www.aws.org>.