



Designation: D2655 – 23

Standard Specification for Crosslinked Polyethylene Insulation for Wire and Cable Rated 0 to 2000 V, 90 °C Operation¹

This standard is issued under the fixed designation D2655; 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 a crosslinked polyethylene insulation for electrical wires and cables in conductor sizes 14 AWG [2.08 mm²] and larger. The base polymer of this insulation consists substantially of polyethylene or a polyethylene copolymer.

1.2 This type of insulation is suitable for continuous use on power cables in wet and dry locations, for voltage ratings not exceeding 2000 V and at conductor temperatures not exceeding 90 °C for normal operation. For copper conductors, the insulation can be applied over the uncoated metal.

1.3 Materials covered by this specification are not sunlight and weather resistant unless they are carbon black pigmented or contain an additive system designed for this protection.

1.4 In many instances the insulation cannot be tested unless it has been formed around a conductor. Therefore, tests are done on insulated wire in this standard solely to determine the relevant property of the insulation and not to test the conductor or completed cable.

1.5 Whenever two sets of values are presented, in different units, the values in the first set are the standard, while those in parentheses are for information only.

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

¹ This specification is under the jurisdiction of ASTM Committee D09 on Electrical and Electronic Insulating Materials and is the direct responsibility of Subcommittee D09.07 on Electrical Insulating Materials.

Current edition approved Aug. 1, 2023. Published August 2023. Originally approved in 1967. Last previous edition approved in 2019 as D2655 – 19. DOI: 10.1520/D2655-23.

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.

D470 Test Methods for Crosslinked Insulations and Jackets for Wire and Cable

D1248 Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable

D1711 Terminology Relating to Electrical Insulation

D2765 Test Methods for Determination of Gel Content and Swell Ratio of Crosslinked Ethylene Plastics

2.2 *ICEA Standard:*

ICEA T-28-562 Test Method for Measurement of Hot Creep of Polymeric Insulations³

3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of terms used in this specification refer to Terminology D1711.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *aging (act of), n*—exposure of materials to air at 121 °C for 168 h.

4. Physical Properties Requirements

4.1 The requirements for the insulation are listed in Table 1.

4.2 *Tensile Strength and Percent Elongation at Rupture:*

4.2.1 The test is conducted in accordance with Test Methods D470. The requirements for tensile strength and elongation are given in Table 1 of this Specification.

4.3 *Heat Distortion:*

4.3.1 The test is conducted in accordance with Test Methods D470. The requirements for heat distortion are given in Table 1 of this specification.

4.4 *Percent Hot Creep and Percent Hot Set:*

4.4.1 Conduct these test in accordance with Test Method ICEA T-28-562.

4.4.2 Determine the percent hot creep for 15 min at 150 °C (302 °F). Meet the filled or unfilled values specified in Table 1.

4.4.3 Determine the percent hot set for 5 min at 150 °C (302 °F). Meet the filled or unfilled values specified in Table 1.

³ Available from Insulated Cable Engineers Association, P. O. Box 440, South Yarmouth, MA 02664 or Global Engineering Documents, 15 Inverness Way East, Englewood, CO 80112.

*A Summary of Changes section appears at the end of this standard