Designation: D 2655 – 00

An American National Standard

Standard Specification for Crosslinked Polyethylene Insulation for Wire and Cable Rated 0 to 2000 V[1]

This standard is issued under the fixed designation D 2655; 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 mm^2) 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 may 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.

2. Referenced Documents

2.1 *ASTM Standards:*

D 470 Test Methods for Crosslinked Insulations and Jackets for Wire and Cable[2]

D 1248 Specification for Polyethylene Extrusion Materials for Wire and Cable[3]

D 1711 Terminology Relating to Electrical Insulation[2]

D 2765 Test Methods for Determination of Gel Content and Swell Ratio of Crosslinked Ethylene Plastics[4]

2.2 *ICEA Standard:*

ICEA T-28-562 Test Method for Measurement of Hot Creep of Polymeric Insulations[5]

3. Terminology

3.1 *Definitions*:

3.1.1 For definitions of terms used in this specification refer to Terminology D 1711.

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

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

5. Electrical Requirements

TABLE 1 Physical Properties for Crosslinked Polyethylene Insulation

Unaged Requirements:	
Tensile strength, min, psi (MPa)	1800 (12.4)
Elongation at rupture, min, %	250
Aged Requirements:	
After Air Oven Test at 121 ± 1°C for 168 h:	
Tensile strength, min, % of unaged value	75
Elongation at rupture, min, % of unaged value	75
Heat Distortion:	
At 121 ± 1°C, max, % of unaged value:	
4/0 Awg (107 mm^2) and smaller (insulation on cable)	30
Larger than 4/0 AWG (107 mm^2) (buffed sample of insulation)	15
Percent Hot Creep	
Filled	100
Unfilled	175
Percent Hot Set	
Filled	5
Unfilled	10

5.1 *Order of Testing*—Perform the ac voltage, insulation resistance, and dc voltage tests in that order when any of these tests are required. The sequence for other testing is not specified.

5.2 *AC Voltage Test*—Subject wires and cables to an ac test voltage for a period of 5 min. Unless otherwise specified, omit this test if the dc voltage test described in 5.4 is to be

[1] This specification is under the jurisdiction of ASTM Committee D09 on Electrical and Electronic Insulating Materials and is the direct responsibility of Subcommittee D09.18 on Solid Insulations, Non-Metallic Shieldings, and Coverings for Electrical and Telecommunications Wires and Cables.

Current edition approved Sept. 10, 2000. Published November 2000. Originally published as D 2655 – 67 T. Last previous edition D 2655 – 95$^{\epsilon 1}$.

[2] *Annual Book of ASTM Standards*, Vol 10.01.

[3] *Annual Book of ASTM Standards*, Vol 08.01.

[4] *Annual Book of ASTM Standards*, Vol 08.02.

[5] 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.