Designation: D1047 – 16

Standard Specification for Poly(Vinyl Chloride) Jacket for Wire and Cable[1]

This standard is issued under the fixed designation D1047; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope*

1.1 This specification covers a durable general-purpose thermoplastic jacket made from poly(vinyl chloride) or the copolymer of vinyl chloride and vinyl acetate suitable for a minimum installing temperature of −10°C.

1.2 The values stated in inch-pound units are the standard, except in cases where SI units are more appropriate. The values in parentheses are for information only.

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D1711 Terminology Relating to Electrical Insulation

D2565 Practice for Xenon-Arc Exposure of Plastics Intended for Outdoor Applications

D2633 Test Methods for Thermoplastic Insulations and Jackets for Wire and Cable

D6360 Practice for Enclosed Carbon-Arc Exposures of Plastics

G151 Practice for Exposing Nonmetallic Materials in Accelerated Test Devices that Use Laboratory Light Sources

G153 Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials

G155 Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials

3. Terminology

3.1 *Definitions:*

3.1.1 For definitions pertinent to this specification, see Terminology D1711.

4. Test Applicable for Sunlight and Weather Resistant Materials

4.1 The jacket shall retain a minimum of 80 % of its unexposed tensile strength and elongation after 720 h of exposure in a dual carbon-arc apparatus or a Xenon arc light apparatus. Prepare the specimens in accordance with Test Methods D2633 for physical tests of insulations and jackets. Do not buff the surface that is exposed to the light source. Perform the test in accordance with Practice D2565 for a Xenon Arc apparatus, using Cycle 1 in Table X3.1 of Practice G155, or Practice D6360, for an enclosed Carbon Arc apparatus, using Cycle 1 of Table X1.1 of Practice G153 depending on which type of apparatus is specified.

5. Physical Properties

5.1 The jacket shall conform to the requirements for physical properties prescribed in Table 1.

5.2 When used on single-conductor nonshielded cable rated 2001 to 5000 V phase to phase, the jacket shall also conform to the requirements for surface resistivity and U-bend discharge in Table 2.

6. Sampling

6.1 Sample the jacket in accordance with Methods D2633 unless otherwise specified.

7. Test Methods

7.1 Unless otherwise specified, test the jacket in accordance with Methods D2633.

8. Keywords

8.1 jacket for wire and cable; poly (vinyl chloride) jacket; thermoplastic jacket

[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.

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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.

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

TABLE 1 Physical Properties for Poly(Vinyl Chloride) Jacket[A]

Unexposed (Unaged) Requirements:	
Tensile strength, min, psi (MPa)	1500 (10.3)
Elongation at rupture, min, %	100
Exposed (Aged) Requirements:	
After Air Oven Aging Test at 100 ± 1°C for 5 days:	
Tensile strength, min, % of unexposed (unaged) value	85
Elongation at rupture, min, % of unexposed (unaged) value	60
After Oil Immersion Test at 70 ± 1°C for 4 h:	
Tensile strength, min, % of unexposed (unaged) value	80
Elongation at rupture, min, % of unexposed (unaged) value	60
Heat distortion, 121 ± 1°C, max, %	50
Heat shock, 121 ± 1°C	no cracks
Cold bend, –35 ± 1°C	no cracks

[A] The values specified are applicable only to jacket having a nominal wall thickness of 0.030 in. (0.76 mm) or greater.

TABLE 2 Requirements for Resisitivity and U-Bend Discharge

Surface resistivity, min, MΩ	200 000
U-bend discharge at the required cable insulation ac test voltage	no cable failures or cracks in the jacket

SUMMARY OF CHANGES

Committee D09 has identified the location of selected changes to this standard since the last issue (D1047 – 11) that may impact the use of this standard. (Approved March 1, 2016.)

(1) Removed Practices G23 and G152 from Referenced Documents (2.1).

(2) Revised 4.1.

(3) Removed Appendix X1.