



Designation: ~~D1047 – 11~~ D1047 – 16

Standard Specification for Poly(Vinyl Chloride) Jacket for Wire and Cable¹

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 reappraisal. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reappraisal.

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 . -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](#)

~~[G23 Practice for Operating Light-Exposure Apparatus \(Carbon-Arc Type\) With and Without Water for Exposure of Nonmetallic Materials \(Withdrawn 2000\)](#)~~³

[G151 Practice for Exposing Nonmetallic Materials in Accelerated Test Devices that Use Laboratory Light Sources](#)

~~[G152 Practice for Operating Open Flame Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials](#)~~

[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](#), depending on which type of apparatus is used. Use Cycle 1 in Table X1.1 of Practice for an enclosed Carbon Arc apparatus, using Cycle 1 of Table [G153](#) or Cycle 1 in Table X3.1 ~~X1.1~~ of Practice ~~G155~~[G153](#); depending on which type of apparatus is used: 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](#).

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 Telecommunication Wires and Cables.

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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

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

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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

APPENDIX

~~X1. Exposures to Laboratory Light Sources~~

~~The initial version of this specification referenced carbon-arc devices described by Practice [G23](#), which described very specific equipment designs. Practice [G23](#) has been withdrawn and replaced by Practice [G151](#), which describes performance criteria for all exposure devices that use laboratory light sources, and by Practice [G152](#) and Practice [G153](#), which gave requirements for exposing nonmetallic materials in filtered open flame carbon-arc devices and enclosed carbon-arc devices, respectively.~~

SUMMARY OF CHANGES

Committee D09 has identified the location of selected changes to this ~~specification standard~~ since the last issue, issue ~~(D1047 – 07D1047, – 11)~~ that may impact the use of this ~~specification standard~~. (Approved ~~August~~ ~~March~~ 1, 2011.)~~2016.~~)

- ~~(1) Added Terminology~~Removed Practices ~~D1711~~ to Referenced Documents: ~~G23~~ and ~~G152~~ from Referenced Documents ~~(2.1)~~.
- ~~(2) Added Revised 4.1 Terminology section.~~
- ~~(3) Deleted Note 1. Removed Appendix X1.~~
- ~~(4) Added Appendix section.~~