



Designation: F479 – 06 (Reapproved 2011)

# Standard Specification for In-Service Care of Insulating Blankets<sup>1</sup>

This standard is issued under the fixed designation F479; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This specification covers the in-service care, inspection, testing, and use voltage of insulating blankets for protection of workers from accidental contact with live electrical conductors, apparatus, or circuits. The product requirements and acceptance testing are as shown in Specification **D1048**.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.3 *This standard does not purport to address all of the safety problems, 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.* See Section **6** and **8.2** for specific precautionary statements.

## 2. Referenced Documents

2.1 *ASTM Standards:*<sup>2</sup>

**D1048** Specification for Rubber Insulating Blankets

**D2865** Practice for Calibration of Standards and Equipment for Electrical Insulating Materials Testing

**F819** Terminology Relating to Electrical Protective Equipment for Workers

2.2 *ANSI Standard:*<sup>3</sup>

**C39.5** Safety Requirements for Electrical and Electronic Measuring and Controlling Instrumentation

**C84.1** Voltage Ratings for Electric Power Systems and Equipment (60 Hz)

## 3. Terminology

3.1 *Definitions:*

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee **F18** on Electrical Protective Equipment for Workers and is the direct responsibility of Subcommittee **F18.25** on Insulating Cover-Up Equipment.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>3</sup> Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

3.1.1 *breakdown*—the electrical discharge or arc occurring between the electrodes and through the equipment being tested.

3.1.2 *compatible*—not injurious to or changing the physical or electrical characteristics of the blankets or affecting their application, use, or acceptability.

3.1.3 *designated person*—an individual who is qualified by experience or training to perform an assigned task.

3.1.4 *electrical testing facility*—a location with qualified personnel, testing equipment, and procedures for the inspection and electrical testing of electrical insulating protective equipment.

3.1.5 *electrode*—the energized or grounded conductor portion of electrical test equipment which is placed near or in contact with the material or equipment being tested.

3.1.6 *flashover*—the electrical discharge or arc occurring between electrodes and over or around, but not through, the equipment being tested.

3.1.7 *insulated*—separated from other conducting surfaces by a dielectric substance (including air space) offering a high resistance to the passage of current.

3.1.7.1 *Discussion*—When any object is said to be insulated, it is understood to be insulated in a suitable manner for the conditions to which it is subjected. Otherwise, it is, within the purposes of this definitions, uninsulated. Insulating covering of conductors is one means of making the conductor insulated.

3.1.8 *ozone*—a very active form of oxygen that may be produced by corona, arcing, or ultraviolet rays.

3.1.9 *ozone cutting and checking*—the cracks produced by ozone in a material under mechanical stress.

3.1.10 *retest*—the tests given after the initial acceptance test usually performed at regular periodic intervals or as required because of physical inspection.

3.1.11 *unassigned blankets*—blankets that are in storage prior to being issued for use.

3.1.12 *voltage, maximum use*—the ac voltage (rms), classification of the protective equipment that designates the maximum nominal design voltage of the energized system that may be safely worked. The nominal design voltage is equal to the phase-to-phase voltage on multiphase circuits.

3.1.12.1 *Discussion*—If there is no multiphase exposure in a system area, and the voltage exposure is limited to the phase

(polarity on dc systems) to ground potential, the phase (polarity on dc systems) to ground potential shall be considered to be the nominal design voltage.

3.1.12.2 *Discussion*—If electrical equipment and devices are insulated or isolated, or both, such that the multiphase exposure on a grounded wye circuit is removed, then the nominal design voltage may be considered as the phase-to-ground voltage on that circuit.

3.1.12.3 *Discussion*—The work practices and methods associated with removing multiphase exposures at any given work site are not addressed in the ASTM standards. The users of ASTM standards should reference appropriate industry consensus standards for proper work practices.

3.1.13 *voltage, maximum retest*—the voltage, either ac rms or dc avg, that is equal to the proof test voltage for new protective equipment.

3.1.14 *voltage, nominal design*—a nominal value consistent with ANSI C84.1-2001, assigned to the circuit or system for the purpose of conveniently designating its voltage class.

3.1.15 *voltage, retest*—the voltage, either ac rms or dc avg, that used protective equipment must be capable of withstanding for a specified test period without breakdown.

3.2 For definitions of other terms, refer to Terminology **F819**.

#### 4. Significance and Use

4.1 Compliance with this specification should continue to provide personnel with insulating blankets of known and acceptable quality after initial acceptance in accordance with Specification **D1048**. The standards herein are to be considered as minimum requirements.

#### 5. Classification

5.1 Blankets covered under this specification shall be designated as Type I or Type II; Class 0, Class 1, Class 2, Class 3, or Class 4; Style A or Style B.

5.2 *Type I*, not resistant to ozone, made from a high-grade *cis*-1,4-polyisoprene rubber compound of natural or synthetic origin, properly vulcanized.

5.3 *Type II*, ozone-resistant, made of any elastomer or combination of elastomeric compounds.

5.4 The class designation shall be based on the electrical properties as shown in Specification **D1048**.

5.5 *Style A*, constructed of the elastomers indicated under Type I or Type II, shall be free of any reinforcement.

5.6 *Style B*, constructed of the elastomers indicated under Type I or Type II, shall incorporate a reinforcement. This reinforcement shall not affect adversely the dielectric characteristics of the blankets.

#### 6. Safety Precautions

6.1 A margin of safety shall be provided between the maximum use voltage on which the blankets are used and the voltage at which they are retested. The relationship between retest voltage and maximum use voltage at which the blankets shall be used is shown in **Table 1**.

**TABLE 1 Voltage Requirements for Blankets**

Class Designation of Blankets	AC Use Voltage, rms, max <sup>A</sup>	AC Retest Voltage, max	DC Retest Voltage, max
0	1000	5000	20 000
1	7500	10 000	40 000
2	17 000	20 000	50 000
3	26 500	30 000	60 000
4	36 000	40 000	70 000

<sup>A</sup> The maximum use voltage is based on the following equations:

Maximum ac use voltage = 0.95 ac maximum retest voltage – 2 000, Classes 1, 2, 3, and 4.

Maximum ac use voltage = 0.95 dc maximum retest voltage – 30 500, Classes 1, 2, 3, and 4.

Maximum ac use voltage = 0.95 dc maximum retest voltage – 18 000, Class 0.

6.2 The user of this type of protective equipment shall be knowledgeable of and instructed in the correct and safe visual inspection and use of this equipment.

#### 7. Inspection and Testing at an Electrical Testing Facility

7.1 The recommended sequence for inspection and testing of insulating blankets at the electrical testing facility is as follows:

7.1.1 Check in, washing, and preliminary inspection,

7.1.2 Electrical test,

7.1.3 Final inspection,

7.1.4 Recordkeeping and marking, and

7.1.5 Packing for storage and shipping.

7.2 Dirty blankets should be cleaned. They may be washed with a mild soap or mild detergent and water. Mild household-type chlorine bleach may be used for disinfectant purposes. Soaps, detergents, and bleaches shall not be used at strengths that would attack or harm the rubber surface. They shall be rinsed thoroughly with water to remove all of the soap or detergent. Severe dirt and grime may be wiped off using a compatible solvent.

7.2.1 The cleaning agent shall not degrade the insulating or physical qualities of the blankets.

7.2.2 A commercial tumble type washing machine may be used. Caution must be observed to eliminate any interior surfaces or edges that may damage the blankets.

7.3 If washed, blankets should be air-dried. The air temperature should not be over 150°F (65.5°C).

7.4 Prior to the electrical test, the blankets shall be given a preliminary inspection for punctures, cuts, corona cutting, or any obvious condition which would adversely affect the performance. If any of these conditions are found, blankets shall be rejected or repaired.

7.5 The blankets shall be tested in accordance with Section **8**.

7.6 After the test, the blankets shall be given an inspection for corona and ozone damage.

#### 8. Electrical Tests

8.1 All blankets issued for service shall be retested and shall withstand the 60-Hz ac test voltage (rms value) or the dc voltage (average value) specified in **Table 1**. The retest shall be