Designation: F 479 – 95

Standard Specification for In-Service Care of Insulating Blankets[1]

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1. Scope

1.1 This specification covers the in-service care, inspection, testing, and use voltage of insulating blankets for protection from electrical shock. The product requirements and acceptance testing are as shown in Specification D 1048.

1.2 *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 for specific precautionary statements.

2. Referenced Documents

2.1 *ASTM Standards:*

D 1048 Specification for Rubber Insulating Blankets[2]

D 2865 Practice for Calibration of Standards and Equipment for Electrical Insulating Materials Testing[3]

F 819 Definitions of Terms Relating to Electrical Protective Equipment for Workers[2]

2.2 *ANSI Standard:*

C 84.1 Voltage Ratings for Electric Power Systems and Equipment (60 Hz)[4]

3. Terminology

3.1 *Definitions:*

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 (in accordance with Definitions F 819).

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 (in accordance with Definitions F 819).

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

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

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

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

3.1.11 *voltage, maximum use*—the a-c 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.

3.1.11.1 If there is no multiphase exposure in a system area, and the voltage exposure is limited to the phase (polarity on d-c systems) to ground potential, the phase (polarity on d-c systems) to ground potential shall be considered to be the nominal design voltage.

3.1.11.2 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 *voltage, maximum retest*—the voltage, either a-c rms or d-c avg, that is equal to the proof test voltage for new protective equipment.

3.1.13 *voltage, retest*—the voltage, either a-c rms or d-c avg, that used protective equipment must be capable of withstanding for a specified test period without breakdown.

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

4. Significance and Use

4.1 Compliance with this specification should continue to provide personnel with insulating blankets of known and

[1] This specification is under the jurisdiction of ASTM Committee F-18 on Electrical Protective Equipment for Workers and is the direct responsibility of Subcommittee F18.25 on Insulating Cover-up Equipment.

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[2] *Annual Book of ASTM Standards*, Vol 10.03.

[3] *Annual Book of ASTM Standards*, Vol 10.02.

[4] Available from the American National Standards Institute, Inc., 11 West 42nd St., 13th Floor, New York, NY 10036.

acceptable quality after initial acceptance in accordance with Specification D 1048. 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 D 1048.

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.

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 Repair,

7.1.3 Electrical test,

7.1.4 Final inspection,

7.1.5 Recordkeeping and marking, and

7.1.6 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.

TABLE 1 Voltage Requirements for Blankets

Class Designation of Blankets	A-C Use Voltage, rms, max[A]	A-C Retest Voltage, max	D-C Retest Voltage, max
0	1 000	5 000	20 000
1	7 500	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

[A] The maximum use voltage is based on the following equations:
Maximum a-c use voltage = 0.95 a–c maximum retest voltage − 2 000_v
Classes 1, 2, 3, and 4.
Maximum a-c use voltage = 0.95 d–c maximum retest voltage − 30 500_v
Classes 1, 2, 3, and 4.
Maximum a-c use voltage = 0.95 d–c maximum retest voltage − 18 000_v
Class 0.

8. Electrical Tests

8.1 All blankets issued for service shall be retested. The interval between date of issue and retests shall be based on work practices and test experience, but shall not exceed 1 year. Blankets that have been tested electrically, but not issued for service, shall not be placed into service unless they have been tested electrically within the previous 12 months.

8.1.1 Where a visual inspection indicates that there may be reason to suspect the electrical integrity of a blanket, an electrical test shall be performed before reissuing the blanket for service.

8.2 The test apparatus shall be designed to afford the operator full protection in the performance of his duties. Reliable means of de-energizing and grounding the high voltage circuit shall be provided. It is particularly important to incorporate positive means of grounding the high voltage section of d-c test apparatus due to the likely presence of high-voltage capacitance charges at the conclusion of the test.

8.3 Both a-c and d-c voltage retest methods are included and either method may be selected for electrical testing.

8.4 All electrical tests shall be performed on clean blankets at normal room temperatures.

NOTE 1—All blankets should be in an unstressed physical condition prior to testing. Failure to achieve this may result in excessive breakdown or damage.

8.5 *A-C Test*:

8.5.1 *Voltage Supply and Regulation*—The voltage supply and its control equipment shall be of such size and design that, with the test specimens in the circuit, the crest factor (ratio of peak to mean effective) of the test voltage shall differ by not more than 5 % from that of a sinusoidal wave over the upper half of the range of the test voltage. The accuracy of the voltage measuring circuit shall be within ±2 % of full scale. The correct rms value of the sinusoidal voltage wave form applied