



Designation: D372 – 00 (Reapproved 2006)

An American National Standard

Standard Specification for Flexible Treated Sleeving Used for Electrical Insulation¹

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1. Scope

1.1 This specification covers electrical insulating sleeving suitable for use on lead wires and in connections in electrical apparatus, such as motors, transformers, and switch gears.

1.2 Materials under this specification are limited to a flexible tubular product made from a woven textile fiber base, such as cotton, rayon, nylon, or glass, thereafter impregnated, or coated, or impregnated and coated, with a suitable insulating material.

NOTE 1—This standard resembles IEC 60684-3-400 to 408 in title only. The content is significantly different.

2. Referenced Documents

2.1 ASTM Standards:²

D350 Test Methods for Flexible Treated Sleeving Used for Electrical Insulation

D1711 Terminology Relating to Electrical Insulation

D4088 Practice for Preparation for Shipment of Solid Electrical Insulating Materials³

2.2 IEC Standard:

IEC 60684-3 Specification for Flexible Insulating Sleeving⁴

3. Terminology

3.1 *Definitions*—For definitions of terms used in this specification, see Terminology D1711.

4. Classification

4.1 Sleeving is categorized by the type of coating, base fabric material, dielectric breakdown voltage, temperature index, minimum wall thickness, and inside diameter, as follows:

4.1.1 *Type I*—A flexible treated sleeving made from organic-base fibers such as cotton, rayon, or nylon and impregnated or coated with an insulating material which can be shown by applicable experience or accepted test to have a temperature index of 105.

4.1.2 *Type II*—A flexible treated sleeving made from inorganic-base yarns such as fibrous glass and impregnated or coated with an insulating material which can be shown by applicable experience or accepted test to have a temperature index of 130.

4.1.3 *Type III*—A flexible treated sleeving made from inorganic-base yarns such as fibrous glass and impregnated or coated with an insulating material, such as poly(vinyl chloride), which can be shown by applicable experience or accepted test to have a temperature index of 105.

4.1.4 *Type IV*—A flexible treated sleeving made from inorganic-base yarns such as fibrous glass and impregnated or coated with an insulating material, such as silicone resin or polytetrafluoroethylene, which can be shown by applicable experience or accepted test to have a temperature index of 200.

4.1.5 *Type V*—A flexible treated sleeving made from inorganic-base yarns such as fibrous glass and impregnated or coated with an insulating material, such as silicone elastomer, which can be shown by experience or accepted test to have a temperature index of 200.

4.1.6 *Type VI*—A flexible treated sleeving made from inorganic-base yarns such as fibrous glass and impregnated or coated with an insulating material, such as epoxies, polyesters, or acrylics, which can be shown by experience or accepted test to have a temperature index of 155.

4.1.7 *Type VII*—A flexible treated sleeving made from inorganic-base yarns such as fibrous glass and impregnated or coated with an insulating material which can be shown by experience or accepted test to have a temperature index of 180.

4.2 Grades of sleeving are identified in terms of minimum average dielectric breakdown voltage, as shown in Table 1.

4.3 Sleeving sizes are shown in Table 2, and are based on the size of round conductors that will fit snugly into the product without distortion of the sleeving.

5. Ordering Information

5.1 Orders for sleeving shall include the following information:

5.1.1 Type and color (Sections 4 and 6),

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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.

³ Withdrawn. The last approved version of this historical standard is referenced on www.astm.org.

⁴ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036.

**TABLE 1 Dielectric Breakdown Voltage Grade Requirements in Kilovolts**

Grade	Conditioning		Types						
			1	2	3	4	5	6	7
A	C-48/23/50	min avg	7.0	7.0	8.0	7.0	8.0	7.0	7.0
		min ind	5.0	6.0	5.0	6.0	5.0	5.0	5.0
B	C-96/23/93 ^A	min avg	25	30	50	70	80	30	50
		min ind	4.0	4.0	4.0	4.0	4.0	4.0	4.0
C	C-48/23/50	min avg	2.5	2.5	2.5	2.5	2.5	2.5	2.5
		min ind	1.5	1.5	1.5	1.5	1.5	1.5	1.5
C-2	C-48/23/50	min avg	1.5	1.5	1.5	1.5	1.5	1.5	1.5
		min ind	0.8	0.8	0.8	0.8	0.8	0.8	0.8

^A Percentage of average test values found after C-48/23/50.

5.1.2 Grade (Section 4),

5.1.3 Size (Table 2),

5.1.4 Type of put-up (coils, spools, cut lengths, and so forth),

5.1.5 Type of packing and packaging (see Practice D4088), and

5.1.6 Marking, if other than specified in Practice D4088.

6. General Requirements

6.1 Colors shall be as agreed upon between the purchaser and the supplier.

7. Dimensional Requirements

7.1 Sleeving shall conform to the inside diameter and wall thickness requirements shown in Table 2.

7.2 The length of product in any coil or spool shall not be less than declared. Spools or coils shall not contain more splices than are allowed in Table 3. The splices shall be minimum in length and conspicuously marked. They shall be strong enough to withstand normal handling during fabrication operations.

7.3 The length of cut pieces of sleeving shall conform to the tolerances shown in Table 4.

8. Chemical and Physical Requirements

8.1 The sleeving shall conform to the requirements for chemical, thermal, electrical, and mechanical properties shown in Table 5.

9. Number of Tests

9.1 Certain of the requirements specified, such as thermal endurance, hydrolytic stability, and effects of solvents, are considered to be related primarily to the composition of the coating rather than to the processing. The length of time required to evaluate these properties may make it impractical to use them for the purpose of lot acceptance. Therefore, the following tests are to be used for lot acceptance testing on all specimens taken (except as shown), unless otherwise agreed upon between the purchaser and the supplier:

9.1.1 Dimensions (inside diameter, wall thickness, length),

9.1.2 Color,

9.1.3 Visual examination for defects,

9.1.4 Dielectric breakdown voltage (C-48/23/50 and C-96/23/93),

9.1.5 Flammability (one specimen only),

9.1.6 Push-back resistance after heat aging (one specimen only), and

9.1.7 Flexibility after heat aging (one specimen only).

9.2 The number of specimens which are to be tested for each of these properties is specified in Test Methods D350, unless otherwise noted.

10. Test Methods

10.1 Conditioning and testing shall be in accordance with Test Methods D350.

NOTE 2—Table 6 contains typical values of breakdown voltage retention for compatibility of the sleeving of this specification with magnet wire.

11. Rejection and Rehearing

11.1 Material that fails to conform to the requirements of this specification may be rejected. Rejection should be reported to the producer or supplier promptly and in writing. In case of dissatisfaction with the results of the test, the producer or supplier may make claim for a rehearing.

12. Packaging and Package Marking

12.1 Packaging, packing, and marking shall be in accordance with Practice D4088 unless otherwise agreed upon between the purchaser and supplier.

13. Keywords

13.1 coated woven textile sleeving; electrical insulation; flexible treated sleeving