



Designation: D751 – 26

Standard Test Methods for Coated Fabrics¹

This standard is issued under the fixed designation D751; 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 These test methods cover, but are not limited to, rubber-coated fabrics, that is, tarpaulins, rainwear, and similar products.

1.2 The scope of each of these test methods appears in the section in which the test method is described.

1.3 The test methods appear in the following sections:

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1.4 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appro-*

priate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

- D573 Test Method for Rubber—Deterioration in an Air Oven
- D1349 Practice for Rubber—Standard Conditions for Testing
- D1424 Test Method for Tearing Strength of Fabrics by Falling-Pendulum (Elmendorf-Type) Apparatus
- D2136 Test Method for Coated Fabrics—Low-Temperature Bend Test
- D2137 Test Methods for Rubber Property—Brittleness Point of Flexible Polymers and Coated Fabrics
- D4483 Practice for Evaluating Precision for Test Method Standards in the Rubber and Carbon Black Manufacturing Industries

3. Significance and Use

3.1 Coated fabrics and rubber products made from coated fabrics are important items of commerce, and adequate test methods must be available to ensure the quality of these products. These test methods provide for this testing capability.

4. Standard Conditions

4.1 *Test Conditions*—Coated fabrics shall be tested in an environment satisfying the conditions as defined in 4.2 or 4.3 unless otherwise specified, or as per agreement between supplier and purchaser. When it is known that the coated fabric is to be used in a tropical environment, the atmosphere described in 4.3 shall be specified.

¹ These test methods are under the jurisdiction of ASTM Committee D11 on Rubber and Rubber-like Materials and are the direct responsibility of Subcommittee D11.37 on Coated Fabrics, Rubber Threads and Seals.

Current edition approved June 1, 2026. Published July 2026. Originally approved in 1943. Last previous edition approved in 2019 as D751 – 19. DOI: 10.1520/D0751-26.

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at www.astm.org/contact. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

4.2 Temperate Atmosphere—The standard condition for testing coated fabrics shall be that reached by the fabric when in moisture equilibrium with a standard atmosphere having a relative humidity of $50 \pm 5\%$ at $23 \pm 2^\circ\text{C}$ ($73 \pm 4^\circ\text{F}$).

4.3 Tropical Atmosphere—The standard condition for testing coated fabrics shall be that reached by the fabric when in moisture equilibrium with a standard atmosphere having a relative humidity of $65 \pm 5\%$ at $27 \pm 2^\circ\text{C}$ ($80 \pm 2^\circ\text{F}$).

4.4 Moisture Equilibrium—It shall be considered that moisture equilibrium is reached when after free exposure to air in motion, there is no progressive increase in mass. Moisture equilibrium shall be approached from the dry side (not moisture-free). Certain coatings may greatly retard moisture penetration into the fabric; therefore, fabrics coated on both sides may require 24 h or more to reach equilibrium.

5. Time Lapse Between Vulcanization and Testing

5.1 For all test purposes, the minimum time between vulcanization and testing should be 16 h.

5.2 For nonproduct tests, the maximum time between vulcanization and testing should be four weeks, and for evaluations intended to be comparable, the tests, as far as possible, should be carried out after the same time interval.

5.3 For product tests, where possible, the time between vulcanization and testing should not exceed three months. In other cases, tests should be made within two months of the date of receipt by the customer.

NOTE 1—Section 5 is not applicable for coated fabrics not requiring vulcanization.

6. Precision and Bias

6.1 Precision—These precision statements have been prepared in accordance with Practice D4483. Please refer to Practice D4483 for terminology and other testing and statistical concepts (see Annex A1 for precision tables).

6.2 The precision results give an estimate of the precision of these test methods with the materials (rubbers) used in the particular interlaboratory program as described in Annex A1. The precision parameters should not be used for acceptance/rejection testing of any group of materials without documentation that they are applicable to those particular materials and the specific testing protocols that include these test methods.

6.3 Bias—In test method statistical terminology, bias is the difference between an average test value and the reference or true test property value. Reference values do not exist for these test methods since the value or level of the test property is exclusively defined by the test method. Bias, therefore, cannot be determined.

DIMENSIONS AND MASS

7. Length

7.1 General Method—Lay the coated fabric out smooth, without tension, on a horizontal surface and measure the length parallel to the selvage; or, measure successive portions, each at least 5 m (5 yd) in length, under the same conditions.

7.2 Drum Method—Run the coated fabric over a measuring drum with just enough uniform tension to keep it running flat and true. Determine the length from the dial or counter on the drum and its calibration.

8. Width

8.1 Measure the width with the coated fabric laid out smooth on a horizontal surface but without tension in either direction. Report the average of at least five different measurements uniformly distributed along the full length of a roll or piece as the average width of the roll or piece.

9. Thickness

9.1 Thickness Gauge—The gauge used for the measurement of thickness shall be of the deadweight type equipped with a dial graduated to read directly to 0.025 mm (0.001 in.). The presser foot shall be circular with a diameter of 9.52 ± 0.03 mm (0.375 ± 0.001 in.). The presser foot and moving parts connected therewith shall be weighted so as to apply a total force of 1.7 ± 0.03 N (6 ± 0.1 oz) equivalent to a pressure of 23.5 ± 0.5 kPa (3.4 ± 0.07 psi) to the specimen. The presser foot and anvil surfaces shall be plane to within 0.0025 mm (0.0001 in.) and parallel to each other to within 0.0025 mm (0.0001 in.). The gauge shall be calibrated for the actual load exerted by the presser foot by means of any device so arranged as to measure the total vertical force exerted by the presser foot at the several gauge readings or presser foot levels selected for calibration. The presser foot shall be brought to each calibration level from a higher one.

NOTE 2—It is suggested that the calibration may be accomplished by supporting the presser foot on a horizontal strap suspended from a weighing device so arranged that it may be raised or lowered gradually and leveled at any required position.

9.2 Procedure—Place the coated fabric upon the anvil of the gauge smooth, but without tension. Lower the presser foot upon the material gradually (without impact), allow it to rest upon it for 10 s, and then observe the reading of the dial. Make similar measurements at not less than five different places uniformly distributed over the surface of the coated fabric exclusive of the area adjacent to either selvage and within one tenth the width of the fabric or within 2.5 m (100 in.) of either end of a roll or piece. Report the average of the five or more measurements as the average thickness.

10. Mass

10.1 Method Applicable to a Piece, Cut, or Roll—Weigh the full piece, cut, or roll, on a calibrated scale accurate to 0.25 %, measure the length and width of the coated fabric, and calculate the mass, reporting it in grams per square metre (ounces per square yard) to the nearest 2.8 g (0.1 oz).

10.2 Method Applicable to a Sample—Cut a specimen having an area of at least 129 cm² (20 in.²), or a number of specimens not less than 50 mm (2 in.) square and having a total area of at least 129 cm² (20 in.²) from the coated fabric, weigh on a calibrated scale accurate to 0.25 %, and calculate the mass, reporting it in grams per square metre (ounces per square yard). Unless a specimen the full width of the fabric is used, take no specimen nearer the selvage than one tenth the width of the fabric.