



Designation: D69 – 19

Standard Test Methods for Friction Tapes¹

This standard is issued under the fixed designation D69; 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 the methods and procedures for testing friction tapes. Such tapes consist of a woven fabric sheeting that has been impregnated with an adhesive insulating compound and cut into rolls of narrow width. These tapes are commonly used for protecting and binding in place, insulation applied to joints of electrical wires and cables, and for other mechanical purposes.

NOTE 1—The material specifications formerly included in these test methods are now contained in Specification **D4514**.

1.2 The test methods included in this standard are as follows:

	Sections
Adhesion	6 – 11
Aged Adhesion	12 – 17
Breaking Strength	18 – 23
Dielectric Breakdown Voltage	24 – 29
Dimensions	30 – 35
Discoloration of Copper	36 – 40
Parallelism	41 – 45

1.3 *Units*—The values stated in SI units are the standard. The inch-pound units in parentheses are for information only. The values stated in each system are not necessarily exact equivalents; therefore, to ensure conformance with the standard, each system shall be used independently of the other, and values from the two systems shall not be combined.

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

NOTE 2—There is no equivalent IEC standard.

1.5 *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 Recom-*

mendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

2. Referenced Documents

2.1 ASTM Standards:²

D149 Test Method for Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials at Commercial Power Frequencies

D412 Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension

D1711 Terminology Relating to Electrical Insulation

D4514 Specification for Friction Tape

D5423 Specification for Forced-Convection Laboratory Ovens for Evaluation of Electrical Insulation

D6054 Practice for Conditioning Electrical Insulating Materials for Testing (Withdrawn 2012)³

3. Terminology

3.1 Definitions:

3.1.1 For definitions of other terms used in this specification, refer to Terminology **D1711**.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *adhesion, n*—the resistance of the tape to unwind itself after being wound up under pressure, in accordance with this test method.

3.2.2 *breaking strength, n*—the force required, per unit width, to break the tape when tested in accordance with this test method.

3.2.3 *conditioning, n*—the exposure of the tape to the influence of a prescribed atmosphere for a stipulated period of time.

3.2.4 *length of tape in a roll, n*—the number of linear yards or meters of tape wound into a roll as measured in accordance with this test method.

¹ These test methods are under the jurisdiction of ASTM Committee **D09** on Electrical and Electronic Insulating Materials and are the direct responsibility of Subcommittee **D09.07** on Electrical Insulating Materials.

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

*A Summary of Changes section appears at the end of this standard

3.2.5 *parallelism, n*—the difference in width between two mated ends of a tape that has been split in half, in accordance with this test method.

3.2.6 *tackiness, n*—the adherence of the friction tape surfaces to themselves after light contact has been made, in accordance with this test method.

4. Sampling

4.1 The producer and consumer shall agree upon the number of rolls selected. Unless otherwise specified a minimum of three rolls per lot shall be tested.

4.2 For sampling purposes, a lot consists of identifiable materials of the same type manufactured in one production run and offered for delivery at the same time.

4.3 Test each sample roll for conformance to all the requirements of the specification.

4.4 Remove and discard at least 610 mm (24 in.) of the outer layer of each sample roll before taking test specimens.

4.5 Unwind the test specimen from the roll at a slow, uniform rate without jerking.

5. Conditioning

5.1 Unless otherwise specified, condition the rolls for 16 h in a standard laboratory atmosphere as specified in Practice D6054.

5.2 Unless otherwise specified, condition the test specimens for 1 h in a standard laboratory atmosphere as specified in Practice D6054.

ADHESION TEST

6. Significance and Use

6.1 In most applications, a friction tape must have adequate adhesion to remain in place and function properly.

7. Apparatus

7.1 *Adhesion Tester*—An assembly similar to that shown in Fig. 1, consisting of a mandrel mounted in a level position in ball bearings. The mandrel shall be 6 mm (0.25 in.) in diameter with a slot 1.6 mm (0.0625 in.) in width and long enough to accommodate the full width of tape. The mandrel shall turn freely under a force of 0.07 N (0.25 Ozf) suspended from a thread wound in a single layer on the center of the mandrel. This assembly is mounted on a wall or other vertical surface to which a vertical scale has been affixed. This scale shall begin 50 mm (2 in.) below the mandrel and extended downward for a distance of 915 mm (36 in.). The scale shall be readable to 3.2 mm (1/8 in.).

7.2 *Weights*—Two sets of weights and a device suitable for clamping the weights to the end of a tape sample, such that a total load of 17.8 N/25 mm (4 lbf/in.) and 44.5 N/25 mm (10 lbf/in.) is achieved.

8. Test Specimen

8.1 Cut a test specimen 580 mm (23 in.) in length of tape removed from the sample roll, with care being taken not to touch the adhesive surfaces to be tested.

9. Procedure

9.1 Insert one end of the specimen into the slot of the mandrel and wind 50 mm (2 in.) onto the mandrel.

9.2 Attach a total weight of 44.5 N/25 mm (10 lbf/in.) to the end of the specimen and wind the remaining 480 mm (19 in.) of the specimen onto the mandrel at an approximate rate of 300 mm/min (12 in./min).

9.3 Allow the tape to remain for 3 min with the weight attached, after which substitute a weight of 17.8 N/25 mm (4 lbf/in.) and allow the tape to unwind.

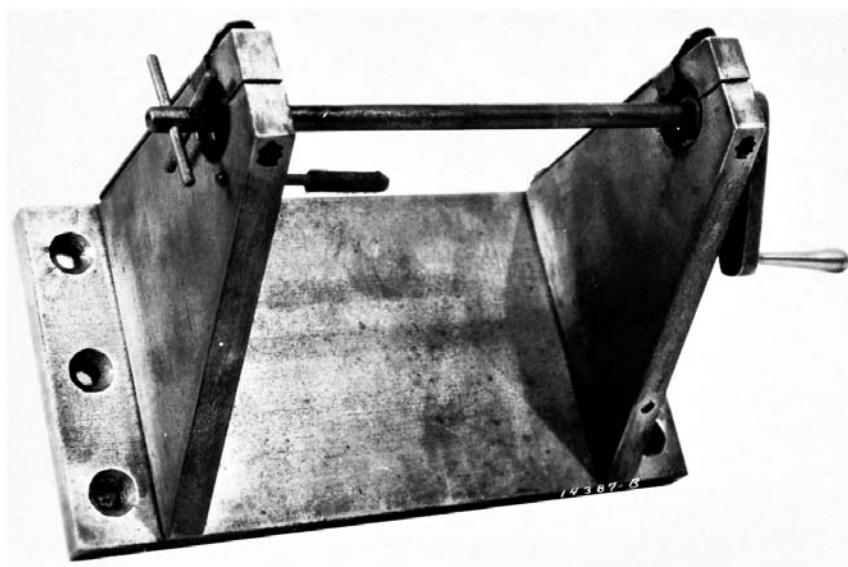


FIG. 1 Tester for Adhesion Test of Friction Tape