



Designation: D5169 – 98(Reapproved 2010)

Standard Test Method for Shear Strength (Dynamic Method) of Hook and Loop Touch Fasteners¹

This standard is issued under the fixed designation D5169; 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.

1. Scope

1.1 This test method measures the shear strength of hook and loop touch (CRE) fasteners using a recording constant rate of extension tensile testing machine.

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 concerns, 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.*

2. Referenced Documents

2.1 *ASTM Standards:*²

D76 Specification for Tensile Testing Machines for Textiles

D123 Terminology Relating to Textiles

D618 Practice for Conditioning Plastics for Testing

3. Terminology

3.1 Definitions:

3.1.1 *hook and loop fastener*—a touch fastener, comprised of two flexible mating strips, the surface of one mating strip being covered with tiny, stiff protrusions shaped like hooks which engage the other mating strip which is covered with pliable loops.

3.1.1.1 *Discussion*—This fastener comprises a non-adhesive method of joining two materials where ready adjustment and removal is desirable and fastening is accomplished by pressing the mating strips together and separation is accomplished by simply peeling apart. Terms herein referring to hook and loop fastening systems shall be construed to include other types of

touch fasteners in which the fastening strength in the shear mode (that is, against forces applied in the plane of the fastener) substantially exceeds the fastening strength in the peel mode (that is, against forces applied perpendicular to the planes of the two components of the fastener).

3.1.2 *shear strength, n*—the resistance to forces that cause, or tend to cause, two contiguous parts of a body to slide relatively to each other in a direction parallel to their plane of contact.

3.2 For definitions of other textile terms used in this test method, refer to Terminology D123.

4. Summary of Test Method

4.1 An area of hook surface is applied to an area of loop surface with controlled engagement pressure. This combination is subjected to a dynamic shear force acting parallel to the surfaces of the specimens.

5. Significance and Use

5.1 This test method gives a measure of a key property of hook and loop touch fasteners which is of interest to users of such devices. This is a means of determining the resistance to separation when forces are applied parallel to the plane of the fastener.

5.2 In the case of a dispute arising from differences in reported test results when using this test method for acceptance testing of commercial shipments, the purchaser and the supplier should conduct comparative tests to determine if there is a statistical bias between their laboratories. Competent statistical assistance is recommended for the investigation of bias. As a minimum, the two parties should take a group of test specimens which are as homogenous as possible and which are from a lot of hook and loop of the type in question. The test specimens should then be randomly assigned in equal numbers to each laboratory for testing. The average results from the two laboratories should be compared using Student's t-test and an acceptable probability level chosen by the two parties before the testing began. If a bias is found, either its cause must be found and corrected or the purchaser and the supplier must agree to interpret future test results in the light of the known bias.

¹ This test method is under the jurisdiction of ASTM Committee D13 on Textiles and is the direct responsibility of Subcommittee D13.54 on Subassemblies.

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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.