



Standard Test Method for Thickness of Highloft Nonwoven Fabrics¹

This standard is issued under the fixed designation D 5736; 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 describes the measurement of thickness of highloft nonwoven fabrics. For thickness of nonwoven fabrics other than highloft, see Test Method D 5729.

1.2 The values stated in SI units are to be regarded as the standard. The inch-pound units given in parentheses may be approximate.

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:

D 123 Terminology Relating to Textile Materials²

D 1776 Practice for Conditioning Textiles for Testing²

D 1777 Test Method for Measuring Thickness of Textile Materials²

D 2904 Practice for Interlaboratory Testing of a Textile Test Method That Produces Normally Distributed Data³

D 5729 Test Method for Thickness of Nonwoven Fabric³

3. Terminology

3.1 Definitions:

3.1.1 *highloft nonwoven fabric, n*—a low-density fiber network structure characterized by a high ratio of thickness to mass per unit area. (Syn. highloft).

3.1.2 *nonwoven fabric, n*—a textile structure produced by bonding or interlocking of fibers, or both, accomplished by mechanical, chemical, thermal, or solvent means, or combination thereof.

3.1.3 *pressure, n*—the force per unit area.

3.1.3.1 *Discussion*—Pressure may be expressed in any appropriate or specified units, such as pascals (Pa), newtons per square metre (N/m²), or pound-force per square inch (psi).

3.1.4 *thickness, n*—the distance between one surface and its opposite.

3.1.4.1 *Discussion*—In textiles, the distance between the upper and lower surfaces of the material; measured under a

specified pressure. Thickness is usually determined as the distance between an anvil, or base, and a presser foot used to apply the specified pressure.

3.1.5 For definitions of other textile terms used in this test method, refer to Terminology D 123.

4. Summary of Test Method

4.1 The thickness of a highloft nonwoven fabric is determined by observing the linear distance that a movable plane is displaced from a parallel surface by the specimen while under a specified pressure.

5. Significance and Use

5.1 This test method is used in the trade for acceptance testing of commercial shipments; however, comparative tests as directed in 5.1.1 may be advisable.

5.1.1 In case of a dispute arising from differences in reported test results when using this test method for acceptance testing of commercial shipments of nonwoven fabrics, 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 that are as homogeneous as possible and that are from a lot of material of the type in question. 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 the appropriate student's *t*-test and an acceptable probability level chosen by the two parties before testing is begun. 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 with consideration to the known bias.

5.2 Thickness is one of the basic physical properties of highloft nonwoven fabrics. In certain industrial applications, the thickness may require rigid control within specified limits. Bulk and warmth properties of highloft nonwoven fabrics are often estimated from their thickness values, and thickness is also useful in measuring performance characteristics, such as before and after abrasion or shrinkage.

5.3 The thickness value of highloft nonwoven fabrics will vary considerably depending on the pressure applied to the specimen at the time the thickness measurement is taken. In all cases, the apparent thickness varies inversely with the pressure applied. For this reason, it is essential that the pressure be

¹ This test method is under the jurisdiction of ASTM Committee D-13 on Textiles and is the direct responsibility of Subcommittee D13.64 on Nonwoven Fabric.

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² *Annual Book of ASTM Standards*, Vol 07.01.

³ *Annual Book of ASTM Standards*, Vol 07.02.