



Standard Test Method for Determination of Compression Resistance and Recovery Properties of Highloft Nonwoven Fabric Using Static Force Loading¹

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1. Scope

1.1 This test method covers the measurement of compression resistance and recovery properties of any type of highloft nonwoven fabric using a simplistic and economical applied static weight loading technique.

1.2 *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.*

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

1.4 This test method offers two options for the measurement of compression resistance and recovery properties. Option 1 contains fewer steps and is, therefore, simpler. Option 2 makes more measurements and provides more details about the behavior of a fabric under these test conditions.

2. Referenced Documents

2.1 ASTM Standards:

D 123 Terminology Relating to Textiles²

D 5796 Test Method for Thickness of Highloft Nonwoven Fabrics³

2.2 ASTM Adjuncts:

D 2904 Practice for Interlaboratory Testing of a Textile Test Method that Produces Normally Distributed Data²

D 2906 Practice for Statements on Precision and Bias for Textiles²

Adjunct TEX-PAC

3. Terminology

3.1 Definitions:

3.1.1 *applied static force, n*—in testing, the application of a fixed force by action of gravity on a fixed mass.

3.1.2 *batting, n*—a textile filling material consisting of a continuous web of fibers formed by carding, garnetting, air laying, or other means.

3.1.3 *compression force, n*—the perpendicular force applied to surface (*s*) of a material in compaction.

3.1.4 *compression recovery, n*—the property of a material to regain its original dimensions after release from compaction.

3.1.5 *compression resistance, n*—the property of a material to oppose its change in dimension under compaction.

3.1.6 *dead-weight loading, n*—in testing, a method of loading in which a mass is supported solely by the specimen and has no other mechanical connection to the test machine. Static loading may be considered a synonym of dead-weight loading.

3.1.7 *elastic loss, n*—the permanent loss of specimen's original dimension after the compression or tension force is applied and then subsequently removed.

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

3.2 For definitions of other textile terms, refer to Terminology D 123.

4. Summary of Test Method

4.1 A specimen (one piece of or a stack of pieces) is placed between two plates and the height of the stack measured. A weight of specified mass is placed on the top plate for a specified period of time. The height of the specimen with the mass in place is measured at specified time intervals. The mass is removed and the height of the stack is measured at specified time intervals. Compression resistance and recovery properties are calculated using the height measurements.

5. Significance and Use

5.1 The ability of a highloft nonwoven fabric to resist compression and recovery and elastic loss after compression are two basic physical properties that are measured to set specifications for certain end-use applications. This test method provides an inexpensive alternative for highloft producers, their suppliers and customers to determine compression resistance, and recovery properties thus better predicting their performance in the finished product.

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

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

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