



Designation: D6828 – 02(Reapproved 2011)

## Standard Test Method for Stiffness of Fabric by Blade/Slot Procedure<sup>1</sup>

This standard is issued under the fixed designation D6828; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 This test method covers the determination of the stiffness of fabrics by measuring the force required to push a specimen into a slot of predetermined width with a metal blade working at a predetermined capacity.

NOTE 1—For other methods for testing stiffness, refer to Test Methods D1388, D4032, and D5732.

1.2 This test method is applicable to fabrics of any fiber content whose stiffness does not exceed the capacity of the Penetrator Beam apparatus. Specimens can be taken from fabrics, rolls, or end products.

1.3 The values stated in SI units are to be considered as standard; the values inch-pound units are included for information only.

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 and health practices and determine the applicability of regulatory limitations prior to use.*

### 2. Referenced Documents

2.1 *ASTM Standards:*<sup>2</sup>

- D123 Terminology Relating to Textiles
- D1388 Test Method for Stiffness of Fabrics
- D1776 Practice for Conditioning and Testing Textiles
- D2904 Practice for Interlaboratory Testing of a Textile Test Method that Produces Normally Distributed Data (Withdrawn 2008)<sup>3</sup>
- D2906 Practice for Statements on Precision and Bias for Textiles (Withdrawn 2008)<sup>3</sup>
- D4032 Test Method for Stiffness of Fabric by the Circular Bend Procedure

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee D13 on Textiles and is the direct responsibility of Subcommittee D13.60 on Fabric Test Methods, Specific.

Current edition approved May 1, 2011. Published July 2011. Originally approved in 2002. Last previous edition approved in 2007 as D6828 – 02(2007). DOI: 10.1520/D6828-02R11.

<sup>2</sup> 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.

<sup>3</sup> The last approved version of this historical standard is referenced on www.astm.org.

D4850 Terminology Relating to Fabrics and Fabric Test Methods

D5732 Test Method for Stiffness of Nonwoven Fabrics Using the Cantilever Test (Withdrawn 2008)<sup>3</sup>

2.2 *Statistical Analysis Software:*<sup>4</sup>

### 3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of textile terms used in this method refer to Terminology D4850. For other terms used in this method, refer to Terminology D123.

### 4. Summary of Test Method

4.1 A swatch of fabric rests on two flat plate supports separated by a fixed distance. A force is applied to the fabric swatch midway between the supports by means of a blade attached to a motor driven beam. The maximum force needed to push the fabric through the supports is measured as a resistance to bending of the fabric.

### 5. Significance and Use

5.1 This test method is considered satisfactory for quality control testing.

5.2 If there are differences of practical significance between reported test results for two laboratories, comparative tests should be performed to determine if there is a statistical bias between them, using competent statistical assistance. As a minimum, use test samples as homogeneous as possible, drawn from the material from which the disparate test results were obtained, and randomly assigned in equal number to each laboratory for testing. The test results from the two laboratories should be compared using a statistical test for unpaired data, at a probability level chosen prior to the testing series. If a bias is found, either its cause must be found and corrected, or future results for the source material must be adjusted in consideration of the known bias.

5.3 The stiffness of fabric relates to its resistance to bending with further processing and use. It measures the fiber and yarn

<sup>4</sup> SAS Institute, Box 8000, Cary, NC 27511.

bending capabilities, the cohesion of individual fibers and yarns relative to their displacement and binders or finishes that hold them in place.

## 6. Apparatus

6.1 *Handle-O-Meter Tester*,<sup>5</sup>(Fig. 1), having the following parts:

6.1.1 *Specimen Platform*, consisting of two adjustable plates capable of forming an opening between the two plates.

6.1.2 *Penetrating Blade*, to force the fabric into the slot between the plates.

6.1.3 *Penetrator Beam*, to move the Penetrator Blade.

6.1.4 *Force Measuring Device*, operating at a predetermined capacity, to measure the force required to force the fabric into the slot.

6.1.5 *Calibration Weight*, for calibration of the force appropriate for the Penetrator Blade.

6.2 *Specimen Marking Template*, 102 by 100 ± 5.0 mm (4.0 by 4.0 ± 0.2 in.).

## 7. Sampling and Test Specimens

7.1 *Primary Sampling Unit*—Consider material as put-up for shipment to be the primary sampling unit, such as rolls, bolts or pieces of fabric, or carton of garments or flat goods, as applicable. (See Annex A1.)

<sup>5</sup> The sole source of supply of the apparatus known to the committee at this time is Thwing-Albert Instrument Co., Philadelphia, PA. If you are aware of alternative suppliers, please provide this information to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee<sup>1</sup>, which you may attend.

7.2 *Laboratory Sampling Unit*—As a laboratory sampling unit take from rolls at least one full-width piece of fabric that is 1 m (1 yd) in length along the selvage (machine direction), after first removing a 1 m (1 yd) length.

7.3 *Test Specimens*—From each laboratory sampling unit, take five specimens 100 by 100 ± 2.5 mm (4 by 4 ± 0.1 in.). Take specimens representing a broad distribution from different positions diagonally across the width of the laboratory sampling unit. Specimens should be staggered in such a manner that no specimens contain the same yarns. With the face of the specimen up, place a small locator mark in the lower right hand corner of the specimen parallel to the warp/machine direction (MD). (See Annex A2.) The mark will be used to correctly position the specimen prior to testing so that the stiffness of four different areas of the specimen can be determined. Label specimen to maintain identity.

7.3.1 For fabric widths 100 mm (4 in.) or more, take no specimens closer than 25 mm (1 in) from the selvage edges of the laboratory sampling unit.

7.3.2 For fabric widths less than 150 mm (4 in.), use the entire width of the laboratory sampling unit for specimens.

7.3.3 Ensure specimens are free of folds, creases, or wrinkles. Avoid getting oil, water, grease, etc. on the specimens when handling.

7.3.4 If the fabric has a pattern, ensure that the specimens are a representative sampling of the pattern.

## 8. Preparation of Apparatus

8.1 Place the tester on a flat surface and level according to manufacturers instructions.

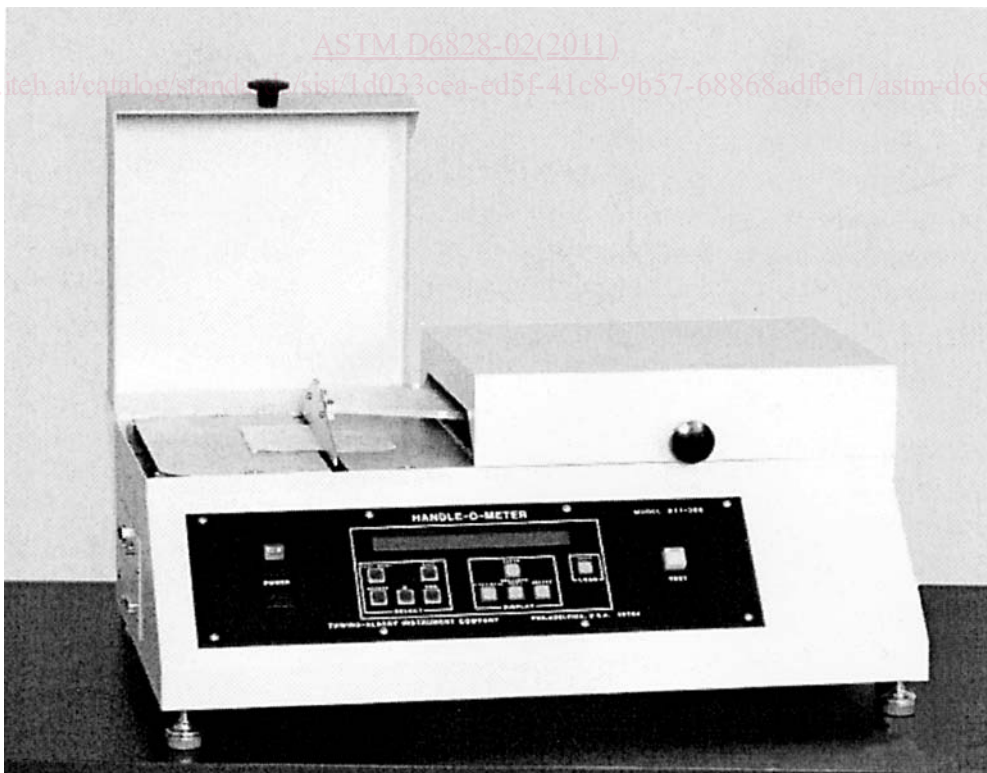


FIG. 1 Handle-O-Meter Tester