Designation: D 4770 – 00

Standard Test Method for Appearance and Integrity of Highloft Batting After Refurbishing[1]

This standard is issued under the fixed designation D 4770; 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 covers procedures for determining the tactile appearance and integrity of a highloft nonwoven batting after machine washing or drycleaning when tested in a finished product or a panel assembly simulating the construction of the finished product.

1.2 This test method is not intended for use on wool/wool blend and cotton/cotton blend batting and needle-punched structures.

1.3 This test method provides the values in both SI units and inch-pound units. "Inch-pound units" is the technically correct name for the customary units used in the United States. "SI units" is the technically correct name for the system of metric units known as the International System of Units. The values stated in either system of units shall be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system must be used independently of the other, without combining in any way.

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:*

D 123 Terminology Relating to Textiles[2]

D 2724 Test Methods for Bonded, Fused, and Laminated Apparel Fabrics[2]

3. Terminology

3.1 *Definitions*—For definitions of terms not cited here, refer to Terminology D 123.

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

3.1.2 *batting integrity*, *n*—the ability of a textile filling material to resist distortion or change when subjected to multiple home launderings or drycleanings.

3.1.3 *distortion*, *n—in textile battings*, defects such a holes, lumps, or thin areas caused by movement of fibers.

3.1.4 *fiberfill*, *n*—manufactured fibers especially engineered as to linear density, cut-length, and crimp for use as a textile filling material.

3.1.5 *microfiber batting*, *n*—a textile filling material containing fibers, such as polyester or olefin, that have a diameter of less than [10 µm].

3.1.6 *needle-punched batting*, *n*—a textile filling material that is stabilized by mechanically entangling the fibers.

3.1.7 *resin bonded batting*, *n*—a textile filling material that is stabilized by spraying it with an acrylic, polyvinyl acetate, or other suitable resin emulsion after which the batting is dried and cured.

3.1.8 *thermal bonded batting*, *n*—a textile filling material that contains low-melting point fibers or polymers that, when heated, fuse the batting materials together.

3.1.8.1 *Discussion*—Thermal bonded batting may also be resin bonded.

3.1.9 *unbonded batting*, *n*—a textile filling material that is neither needle-punched, resin bonded, or thermal bonded (see also needle-punched batting, resin bonded batting, thermal bonded batting).

4. Summary of Test Method

4.1 Specimens in an end use product or in a test panel assembly are laundered or drycleaned in a prescribed cycle. The treated specimens are evaluated for integrity by comparing with photographic rating standards[3] and for changes in tactile appearance.

5. Significance and Use

5.1 This test method is used to determine the integrity of the batting or to identify the need for an alternative fiberfill batting or construction technique to meet performance requirements. Maintaining batting integrity is important to the insulating properties and appearance retention over the life of the item.

6. Apparatus and Materials

6.1 *Drycleaning Machine*—A single unit, coin-operated or

[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 Nonwovens.

Current edition approved March 10, 2000. Published May 2000. Originally published as D 4770–88. Discontinued November 1996 and reinstated ast D 4770–00.

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

[3] A set of photographic standards illustrating changes in appearance and integrity of batting is available from ASTM Headquarters. Request ADJD4770.

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professional type machine, capable of providing a complete automatic dry-to-dry cycle using perchloroethylene.

6.2 *Domestic Automatic Washer*, top loading, spin extracting type.

6.3 *Domestic Automatic Tumble Dryer*, front loading type.

6.4 *Perchloroethylene*—A commercial drycleaning solution containing perchloroethylene solvent and a drycleaning detergent or a standard detergent/drycleaning solution prepared as described in Test Method D 2724. **Warning—** Perchloroethylene is toxic, and the usual precautions for handling chlorinated solvents should be taken. It should be used only under well-ventilated conditions.

6.5 *Detergent*, home laundry type.

6.6 *Photographic Rating Standard.*

7. Sampling

7.1 *Sample Classification*:

7.1.1 *Acceptance Testing for End Use Products*:

7.1.1.1 *Laboratory Sample*—As a laboratory sample for acceptance testing select a minimum of two finished products at random for each lot sample.

7.1.1.2 *Test Specimens*—Use the largest unsewn or unrestricted portion of the laboratory sample for evaluation of the durability of the batting.

7.1.2 *Prototype Sampling*:

7.1.2.1 Perform tests on prototypes thereof as they will reach the consumer.

7.1.2.2 It is desirable to have two samples available for testing, one being a control.

7.1.3 *Panel Assemblies:* Use two panel assemblies, minimum size of 450 by 600 mm (18 by 24 in.) simulating the construction of the finished product.

NOTE 1—An adequate specification or other agreement between the purchaser and the supplier requires taking into account the variability between cartons, items within a carton, and between specimens from a finished product to provide a sampling plan with a meaningful producer's risk, consumer's risk, acceptable quality level, and limiting quality level.

8. Specimen Preparation

8.1 Using indelible ink, mark one specimen with the type and frequency of laundering or drycleaning and proper sample identification. Retain the remaining specimen as a control.

8.2 Spread the specimen on a flat surface in such a manner, (for example, unzipped), that only one thickness of the largest surface area is exposed.

8.3 Applying light pressure, press the palm of the hand over the surface of the specimen feeling for clumps, depressions, and voids in the batting. Using indelible ink, mark on the specimen surface the location of any defects noted.

9. Procedure

9.1 Perform three refurbishing cycles following the instructions on the care label attached to the end use product.

9.1.1 In the absence of a care label, use the following procedure: machine wash 50 ± 3°C (120 ± 5°F) with high water level, tumble dry according to Test Method D 2724 but do not iron.

9.2 If the fiber content, construction, or trim of the shell fabric is subject to damage by machine washing, dryclean the specimen according to Test Method D 2724, but do not press.

10. Interpretation of Results

10.1 Repeat 8.2 and 8.3 but do not remark the specimens.

10.2 Record the nature and locations of the observed changes comparing them with those noted before refurbishing (see 8.2). Rate these changes using Table 1.

10.3 Using the same test area as that used in 10.2, cut any cover, lining, or any other fabric that may be encountered, to expose as large an area of the batting as possible. Visually compare the batting specimen directly against the photographic rating standard. Rate and record the integrity rating using the photographic rating standard number that most closely compares to the batting in the specimen.

10.4 Average the visual ratings and integrity ratings for the Laboratory Sample.

11. Report

11.1 State in the report that the tests were performed as directed in Test Method D 4770. Describe the materials or products sampled and the sampling method used.

11.2 Report the following information:

11.2.1 Observations and visual ratings noted in 10.2 and 10.3,

11.2.2 Integrity ratings determined in 10.3,

11.2.3 If desired for clarity, include a photograph or sketch of specimens indicating the locations of observed conditions,

11.2.4 Type of refurbishing, and

11.2.5 Any modifications of the test method.

12. Precision and Bias

12.1 No information is presented about the precision and bias of Test Method D 4770 for rating the durability of highloft nonwoven battings because the value of batting integrity is nonquantitative.

13. Keywords

13.1 batting; batting highloft; highloft; integrity

TABLE 1 Ratings for Changes in Batting

Rating	Visual Rating Description
5	No detectable change
4	Slight change
3	Moderate change
2	Significant change
1	Extreme change

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