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Dimensional Changes in Commercial Laundering of Woven and Knitted Fabrics Except Wool

Developed in 1960 by AATCC Committee RA42; revised 1967, 1980, 1988 (with title change), 1995, 1997, 1999, 2001, 2012; reaffirmed 1972, 1975, 2009; editorially revised 1973, 1974, 1975, 1982, 1983, 1984, 1989, 1990, 1991, 1994, 2004, 2005, 2006, 2008, 2014; technical correction 1984; editorially revised and reaffirmed 1993. Related to ISO 5077.

1. Purpose and Scope

1.1 This test method is used to determine the dimensional changes in woven and knitted fabrics made of fibers other than wool when subjected to laundering procedures commonly used in a commercial laundry. A range of laundering test procedures from severe to mild is provided to allow simulation of the various types of commercial launderings available. Five drying test procedures are established to cover the drying techniques used.

1.2 These tests are not accelerated and must be repeated to determine dimensional changes after multiple launderings.

2. Principle

2.1 The dimensional change of woven and knitted fabric specimens subjected to washing, drying and restoration procedures typical of commercial laundering are determined by measuring changes in bench mark distances applied to the fabric before laundering.

3. Terminology

3.1 **commercial laundering**, *n.*—a process by which textile products or specimens may be washed, rinsed, bleached, dried and pressed in commercial laundering equipment, typically at higher temperatures and pHs and longer times than used for home laundering.

3.2 **dimensional change**, *n.*—a generic term for changes in length or width of a fabric specimen subjected to specified conditions (see also *shrinkage* and *growth*).

3.3 **growth**, *n.*—a dimensional change resulting in an increase in the length or width of a specimen.

3.4 **laundering**, *n.*—of textile materials, a process intended to remove soils and/or stains by treatment (washing) with an aqueous detergent solution that normally includes rinsing, extracting and drying.

3.5 **shrinkage**, *n.*—a dimensional change resulting in a decrease in the length or width of a specimen.

3.6 **wool**, *n.*—used in the generic sense,

fiber from the fleece of the sheep or lamb, hair from the Angora or Cashmere goat, rabbit hair and the specialty hair fibers from camel, alpaca, llama and vicuna.

4. Safety Precautions

NOTE: These safety precautions are for information purposes only. The precautions are ancillary to the testing procedures and are not intended to be all inclusive. It is the user's responsibility to use safe and proper techniques in handling materials in this test method. Manufacturers MUST be consulted for specific details such as material safety data sheets and other manufacturer's recommendations. All OSHA standards and rules must also be consulted and followed.

4.1 Good laboratory practices should be followed. Wear safety glasses in all laboratory areas.

4.2 The 1993 AATCC Standard Reference Detergent and the 2003 AATCC Standard Reference Liquid Detergent may cause irritation. Care should be taken to prevent exposure to skin and eyes.

4.3 Manufacturer's safety recommendations should be followed when operating laboratory testing equipment.

5. Apparatus and Materials (see 12.1)

5.1 Apparatus.

5.1.1 Wash wheel of the reversing type (see 12.2).

5.1.2 Flatbed press measuring 60 × 125 cm or larger. Any flatbed press capable of pressing specimen 55 cm square may be used as an alternative. The flatbed press is maintained at a temperature not less than 135°C.

5.1.3 Dryer of the rotary tumble type, having a cylindrical basket approximately 75 cm in diameter and 60 cm in length and rotating at approximately 35 rpm. The dryer is provided with a means of maintaining a drying temperature of 60 ± 11°C measured in the exhaust vent as close as possible to the drying chamber.

5.1.4 Conditioning/drying rack with pull-out screen or perforated shelves (see 12.3).

5.1.5 Facilities for drip and line drying.

5.1.6 Hydro-extractor, centrifugal extractor of the laundry type with a perforated basket, 29.0 cm deep × 51.0 cm diameter with an operating speed of 1700 rpm.

5.1.7 Ballast of 92 × 92 ± 3 cm hemmed pieces of bleached cotton sheeting (Wash load ballast type 1) or 50/50

polyester/cotton bleached and mercerized plain weave (Wash load ballast type 3) (see 12.11).

5.2 Measuring devices.

5.2.1 Indelible ink marking pen (see 12.4) for use with suitable rule, tape, marking template (see 12.5).

5.2.2 Tape or rule with divisions in millimeters or smaller increment (see 12.5).

5.2.3 Needle and sewing thread can be used to make bench marks (see 12.10).

5.2.4 Digital Imaging System (see 12.12).

5.3 Materials.

5.3.1 Detergent, alkylarylsulfonate type, or 1993 AATCC Standard Reference Detergent or 2003 AATCC Standard Reference Liquid Detergent (see 12.6 and 12.11).

5.3.2 Hand iron, electric, steam or dry, weighing approximately 1.4 kg.

6. Test Specimens

6.1 Sampling.

6.1.1 Test three specimens of each sample. Where possible, each specimen should contain different groups of lengthwise and widthwise yarns.

6.1.2 Fabrics that are badly distorted in their unlaundered state may give deceptive dimensional change results when laundered by any procedure. Therefore, it is recommended that the specimen not be taken from such areas or, if used, the results considered as indicative only.

6.1.3 In cases of dispute or litigation: Pre-condition test specimens as directed in ASTM D1776, Standard Practice for Conditioning and Testing Textiles, prior to conditioning. Otherwise, condition test specimens for at least 4 h in an atmosphere of 21 ± 1°C (70 ± 2°F) and 65 ± 2% RH by laying each test specimen separately on a conditioning rack.

6.2 Size, Preparation and Marking.

6.2.1 The size and preparation of test specimens will vary depending upon the type of fabric being tested.

6.2.2 For woven and warp knit fabrics at least 60 cm wide: Preferably, cut three 60 × 60 cm test specimens. Mark each specimen with three 46 cm pairs of bench marks parallel to the length of the fabric, and three 46 cm pairs of bench marks parallel to the width of the fabric. Each bench mark must be at least 8 cm from all edges of the test specimens. Pairs of bench marks in the same direction must be approximately 15 cm apart (see Fig. 1). Alternatively, if sample size is limited, cut three 40 × 40 cm test specimens. If using this size, mark each specimen with