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Dimensional Changes of Fabrics: Accelerated

Developed in 2000 by AATCC Committee RA42; reaffirmed 2001, 2002; revised 2004, 2013; editorially revised 2006, 2008, 2011; editorially revised and reaffirmed 2009. Related to ISO 23231.

1. Purpose and Scope

1.1 This test method is an accelerated procedure for determination of the dimensional change of fabrics. The procedure uses an apparatus with programmable settings that simulate multiple home or commercial launderings or wet processing.

1.2 This method does not replace dimensional change test methods currently in use.

2. Principle

2.1 Dimensional changes are determined by comparing the distances between length and width direction benchmark marks before and after a programmed test cycle.

3. Terminology

3.1 **dimensional change**, *n.*—a generic term for changes in length or width of a fabric specimen subjected to specified conditions. The change is usually expressed as a percentage of the initial dimension of a specimen.

3.2 **growth**, *n.*—of textile materials, a dimensional change resulting in an increase of length or width of a specimen.

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

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

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 Manufacturer's safety recommen-

dations should be followed when operating accelerated testing equipment.

5. Uses and Limitations

5.1 Although data have been generated comparing the dimensional change of some textile fabrics after home laundering and this accelerated apparatus, the user will find it necessary to determine the correlation between the results from a selected program for this apparatus and the dimensional change results from other chosen test methods or wet processes (see 14.4).

5.2 While the term "laundering" includes the use of an aqueous detergent (during washing) and subsequent drying, this accelerated method does not use detergents.

6. Apparatus and Materials

6.1 Accelerated laundering apparatus (see 14.1).

6.2 Indelible ink marking pen. Select marking pens with the smallest tip (see 14.2).

6.3 Tape or ruler marked in millimeters.

6.4 A tape or ruled template marked with, or from which, percent dimensional change to 0.5% or smaller increment can be directly read (see 14.2).

6.5 Digital Imaging System (see 14.3).

7. Sampling

7.1 Take a sufficient number of samples from a lot to provide an adequate number of data points to generate satisfactory precision.

7.2 It is recommended that a minimum of four specimens with different length and widthwise yarns in each specimen be taken from each sample.

8. Specimens

8.1 Cut specimens parallel to the lengthwise fabric direction as shown in Fig. 1a. Diagonal alignment of specimens may be selected to minimize the need for over-edges specimens and to obtain larger benchmark dimensions (see Fig. 1b).

8.2 The size of specimens may depend upon the model of the apparatus and the type, number and configuration of its basket chambers.

8.2.1 Specimens, 190 × 190 mm, aligned with the fabric length and width directions and marked with 125 mm benchmark distances are recommended by the instrument manufacturer. Alternatively, 255 × 255 mm specimens can be

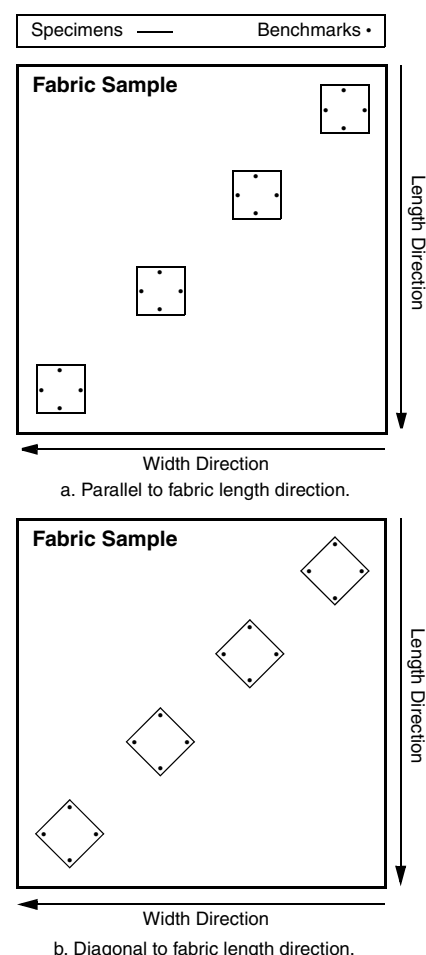


Fig. 1—Specimen and benchmark placement.

cut diagonally to accommodate 255 mm benchmark distances that are aligned with the actual length and width directions of the fabric (see Fig. 1b).

8.3 The use of standard textile conditioning prior to or after a test cycle program completion is not required.

8.4 To improve the accuracy and precision of dimensional change calculations based on the benchmark distances applied to the specimens as in 8.2.1, measure and record the distance between each pair of benchmark marks with suitable tape or ruler to the nearest millimeter before starting the test. This is measurement A. If using a template or ruler from which direct percent dimensional change can be read, verify that the original benchmark distances are exact.

9. Test Procedure

9.1 Using the program in Table I, de-