



Designation: D 6613 – 00

Standard Practice for Determining the Presence of Sizing in Nylon or Polyester Fabric¹

This standard is issued under the fixed designation D 6613; 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 For fabrics made of nylon and polyester yarns prepared with an acrylic or polyester sizing, this practice describes the procedures for dyeing the fabric to determine the presence and relative amount of acrylic or polyester sizing in it, using a color scale of 1 to 5.

1.2 Procedures and apparatus other than those stated in this standard may be used by agreement of purchaser and supplier with the specific deviations from the standard acknowledged in the report.

1.3 *This practice may involve hazardous materials, operations, and equipment. This practice 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 practice 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 Textiles²

D 1776 Practice for Conditioning of Textiles²

2.2 *American Association of Textile Chemists and Colorists (AATCC):*

AATCC Evaluation Procedure # 8 Chromatic³

3. Terminology

3.1 *Definitions:*

3.1.1 *extractable matter, n*—nonfibrous material in or on a textile, not including water, which is removable by a specified solvent or solvents, as directed in a specified procedure.

3.1.2 *sizing, n*—a generic term for compounds which, when applied to yarn or fabric, form a more or less continuous solid film around the yarn and individual fibers.

3.2 For definitions of other terms used in this test method, refer to Terminology D 123.

4. Summary of Practice

4.1 Test specimens of nylon or polyester fabric are cationically dyed. The resulting depth of color of the dyed fabric is

qualitatively indicative of the presence and relative amount of acrylic or polyester sizing in the fabric.

4.2 The color of the dyed fabric is matched to a color on an AATCC chromatic scale to determine the level of sizing in the fabric.

5. Significance and Use

5.1 The depth of color achieved in dyeing fabric according to this practice is directly proportional to the amount of sizing in the fabric. This practice employs a chromatic staining scale from 1 to 5 which is inversely proportional to the relative amount of sizing in the fabric. A light color stain indicates a low concentration of sizing and warrants a high numerical rating, while a dark color stain indicates a high concentration of sizing and warrants a low numerical rating.

5.2 The accuracy of this practice depends upon the ability of the testing personnel to match the color of the stain to the colors in the AATCC Chromatic Scale.

5.3 For determining quantitatively the amount of extractable matter in a fabric, refer to D XXXX (Standard Test Method for Determining the Percent Extractable Matter by Weight in Fabric Composed of Nylon or Polyester Filament Yarn).

6. Apparatus

6.1 *Stainless Steel or Glass Beaker* with a capacity of 1000 ml.

6.2 *Glacial Acetic Acid.*

6.3 *AATCC 9 Step Chromatic Transference Scale³ (Crock Scale).*

6.4 *Ventilated Forced Air Drying Oven* capable of maintaining $350^{\circ} \pm 5^{\circ}\text{F}$ ($177 \pm 3^{\circ}\text{C}$).

6.5 *Sevron Red 4G or equivalent Basic Red 14 Dye stuff.*

6.6 *Fine Mesh Sieve* Fine mesh sieve with a count of per inch 100×100 .

7. Conditioning

7.1 Neither preconditioning nor conditioning is necessary.

8. Sampling

8.1 Determining residual size is a destructive test and therefore necessitates sampling procedures if used in conjunction with lot acceptance of commercial shipments.

8.2 *Lot Sample*

8.2.1 For acceptance testing, the lot size is the quantity of

¹ This practice is under the jurisdiction of ASTM Committee D13 on Textiles and is the direct responsibility of Subcommittee D13.20 on Inflatable Restraints.

Current edition approved Nov. 10, 2000. Published February 2001.

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

³ Available from AATCC P.O. Box 12215, Research Triangle Park, N.C. 27709.

fabric finished in one production day or as agreed between purchaser and supplier.

8.2.2 Unless otherwise agreed by purchaser and supplier, take as a lot sample all of the rolls in a commercial shipment. Consider the rolls to be the primary sampling units.

8.3 *Laboratory Sample*

8.3.1 An entire roll of fabric or a full-width cut end from the end of a roll within a lot sample constitutes a laboratory sample.

8.4 *Test Specimens*

8.4.1 Test specimens are the pieces of fabric that actually undergo testing. Select specimens from the end of each roll of fabric in the laboratory sample, as indicated in the material specification or equivalent.

8.4.2 Unless otherwise agreed upon or specified take two 5 in × 5 in (12 cm × 12 cm) specimens from the fabric roll to be tested.

9. Procedure

9.1 Prepare Acid Rinse Solution of 0.25% Acetic Acid solution by mixing 2.5 g glacial acetic acid in 1000 g water.

9.2 Prepare Dye Solution by dissolving 1 g of 100% Sevron Red 4G or other Basic Red 14 dyestuff in 1000 g of water.

9.3 Place specimen in oven preheated to $177 \pm 30^{\circ}\text{C}$ ($350 \pm 50^{\circ}\text{F}$) for 3 min.

9.4 Remove specimen from oven and let return to room temperature.

9.5 Immerse in a 10:1 ratio of acid solution. Remove and drain excess.

9.6 Immerse rinsed and drained specimen in Sevron Red solution for 30 ± 5 sec at room temperature.

9.7 Remove specimen from dye solution and rinse for 1 min under warm tap water at $40\text{--}50^{\circ}\text{C}$ ($105\text{--}120^{\circ}\text{F}$).

9.8 Visually compare the residual color of the specimen to the AATCC 9 Step Chromatic Transference Scale (Crock scale) in accordance with AATC Evaluation Procedure # 8 Chromatic and report a class rating as follows:

Class 1– Heavily stained

Class 2– Considerably stained

Class 3– Noticeably stained

Class 4– Slightly stained

Class 5– Negligible to no stain

9.9 Repeat procedure with second specimen.

10. Report

10.1 State that the test was conducted in accordance with Test Method D 6613 for determining the residual size content of inflatable restraint fabrics.

10.2 If deviation from Practice D 6613 occurred, any reference to this standard shall state: “Testing was performed in accordance with ASTM D 6613, with the following changes.”

10.3 The purchaser and supplier shall determine the exact form of the test report. Unless otherwise specified, the form shall provide the following information:

10.3.1 Fabric designation,

10.3.2 Lot identification,

10.3.3 Date of report,

10.3.4 Name of person certifying report,

10.3.5 Relevant specification,

10.3.6 Number of specimens used in each test,

10.3.7 Tests performed and class rating assigned,

10.3.8 Laboratory conditions if other than standard,

10.3.9 Deviations from standard procedures and apparatus.

11. Conformance

11.1 When lot acceptance applies, the test results of this practice should conform to allowable ranges listed in the applicable material specification or other agreement between purchaser and supplier in order to warrant release of the fabric shipment.

11.2 The supplier shall report non-conformity to the purchaser in writing. A fabric lot that fails to conform to physical testing requirements as specified or as otherwise agreed upon may only be released for shipment upon written consent of the purchaser.

11.3 In case of dispute arising from differences in reported results when using this practice, the purchaser and the supplier should conduct correlation tests between their laboratories. As a minimum, the two parties should take a group of homogeneous test specimens from the same lot of fabric, randomly assigning them in equal numbers to each laboratory for testing. If after the average results from the two laboratories are visually compared and a difference in average class rating is found to exist, either its cause should be found and corrected, or the purchaser and supplier should agree to interpret future results based on the correlation established between the two laboratories.

12. Precision and Bias

12.1 There is no Precision and Bias statement associated with this practice because it relies on a visual comparison and no data is generated. However, there can be differences in results between laboratories that may require a correlation between labs as discussed in section 11.3 of this practice.

13. Keywords

13.1 crock scale; extractable matter; sizing; staining

 **D 6613**

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