



Designation: D 6613 – 04₂

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

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1. Scope

1.1 Using a color scale of 1 to 5, this practice describes the procedures for determining the presence and relative amount of sizing in fabrics made of undyed nylon or non-cationically dyeable polyester yarns prepared with a cationically dyeable sizing

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:*

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 ~~May~~ April 10, 2004₂. Published ~~August~~ June 2002. Originally published as D 6613-00. Last previous edition D 6613-00₁.

D 123 Terminology Relating to Textiles²

D 1776 Practice for Conditioning of Textiles²

D 6799 Terminology Relating to Inflatable Restraints³

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

AATCC AATCC Evaluation Procedure # 8⁴

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 textile terms used in this ~~test method~~, standard, refer to Terminology D 123 and Terminology D 6799.

4. Summary of Practice

4.1 Test specimens of undyed nylon or polyester fabric are cationically dyed at room temperature. The resulting depth of color of the dyed fabric is indicative of the presence and relative amount of cationically dyeable 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 relative 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 9 Step Chromatic Transference Scale.

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 Scale*⁴.

6.4 *Ventilated Forced Air Drying Oven* capable of maintaining 350° ± 5°F (177 ± 3°C).

6.5 *100% concentration of Sevron 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 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.

² Annual Book of ASTM Standards, Vol 07.01.

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

⁴ Annual Book of ASTM Standards, Vol 07.02.

⁴ Available from AATCC P.O. Box 12215, Research Triangle Park, N.C. 27709.

9. Procedure

- 9.1 Prepare Acid Rinse Solution of 0.25% Acetic Acid solution by mixing 2.5 ± 0.1 g glacial acetic acid in 1000 ± 10 g water.
- 9.2 Prepare Dye Solution by dissolving 1 ± 0.1 g of 100% concentration of Sevron Red 4G or other Basic Red 14 dyestuff in 1000 ± 10 g of water.
- 9.3 Place specimen in oven preheated to $177 \pm 3^\circ\text{C}$ ($350 \pm 5^\circ\text{F}$) for a minimum of 3 min.
- 9.4 Immerse specimen for 10 ± 1 sec in a 10:1 ratio of acid rinse solution.
- 9.5 Immerse rinsed and drained specimen in dye solution for 30 ± 5 sec at room temperature.
- 9.6 Remove specimen from dye solution and rinse for 60 ± 5 sec under warm tap water at $40\text{--}50^\circ\text{C}$ ($105\text{--}120^\circ\text{F}$).
- 9.7 Visually compare the residual color of the specimen to the AATCC 9 Step Chromatic Transference Scale in accordance with AATC Evaluation Procedure # 8 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
- 9.8 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

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