Designation: D2052 – 05 (Reapproved 2015)

Standard Test Method for Colorfastness of Zippers to Drycleaning[1]

This standard is issued under the fixed designation D2052; 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 the determination of change in shade and of staining of zipper stringers under drycleaning conditions. This test method is applicable to the textile portion of zipper stringers of all materials.

1.2 The values stated in either SI units or inch-pound units are to be regarded separately as the standard. Within the text, the inch-pound units are shown in parentheses. The values stated in each system are not exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in nonconformance with this test method.

1.3 *This standard does not purport to address all of the safety problems associated with its use. It is the responsibility of whoever uses this standard to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D123 Terminology Relating to Textiles
D2050 Terminology Relating to Fasteners and Closures Used with Textiles
D2051 Test Method for Durability of Finish of Zippers to Laundering
D2053 Test Method for Colorfastness of Zippers to Light
D2054 Test Method for Colorfastness of Zipper Tapes to Crocking
D2057 Test Method for Colorfastness of Zippers to Laundering
D2058 Test Method for Durability of Finish of Zippers to Drycleaning
D2059 Test Method for Resistance of Zippers to Salt Spray (Fog)
D2060 Test Methods for Measuring Zipper Dimensions
D2061 Test Methods for Strength Tests for Zippers
D2062 Test Methods for Operability of Zippers
D2724 Test Methods for Bonded, Fused, and Laminated Apparel Fabrics
D3692 Practice for Selection of Zippers for Care-Labeled Apparel and Household Furnishings

2.2 *AATCC Methods:*

Evaluation Procedure 1, AATCC Gray Scale for Color Change[3]
Evaluation Procedure 3, AATCC Chromatic Transference Scale[3]

3. Terminology

3.1 For all terminology related to D13.54, Subassemblies, refer to Terminology D2050.

3.1.1 The following terms are relevant to this standard: colorfastness, drycleaning.

3.2 For all other terminology relating to textiles, see Terminology D123.

4. Summary of Test Method

4.1 A specimen of the zipper stringer, in conjunction with multifiber test fabric is subjected to drycleaning. The drycleaned specimen is compared with an original specimen (see 10.1) and any change in color of the specimen or staining of the multifiber test cloth is then assessed using the AATCC Gray Scale for Color Change or the AATCC Chromatic Transference Scale, as appropriate.

5. Significance and Use

5.1 Test Method D2052 is useful for testing to determine if the degree of alteration in shade is satisfactory for the intended end-use and for determining if unacceptable staining of color into adjacent fabric will occur.

NOTE 1—For guidance in evaluating the results of this test method, refer to Practice D3692.

5.2 This test method is considered satisfactory for acceptance testing of commercial shipments because the method has been used extensively in the trade for acceptance testing.

[1] This test method is under the jurisdiction of ASTM Committee D13 on Textiles and is the direct responsibility of Subcommittee D13.54 on Subassemblies. The method was developed in cooperation with the Slide Fastener Assn., Inc.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Technical Manual of the American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709.

5.2.1 If there are differences of practical significance between reported test results for two laboratories (or more), comparative tests should be performed to determine if their is a statistical bias between them, using competent statistical assistance. As a minimum, the test samples should be used that are as homogeneous as possible, that are drawn from the material from which the disparate test results were obtained, and that are randomly assigned in equal numbers to each laboratory for testing. Other materials with established test values may be used for this purpose. The test results from the two laboratories should be compared using a statistical test for unpaired data, at probability level chosen prior to the testing series. If a bias is found, either its cause must be found and corrected, or future test results must be adjusted in consideration of the known bias.

5.3 The method(s) in this standard along with those in Test Methods D2051, D2053, D2054, D2057, D2058, D2059, D2060, D2061, and D2062 are a collection of proven zipper test methods. They can be used as aids in the evaluation of zippers without the need for a thorough knowledge of zippers. The enumerated test methods do not provide for the evaluation of all zipper properties. Besides those properties measured by means of the enumerated test methods there are other properties that may be important for the satisfactory performance of a zipper. Test methods for measuring those properties have not been published either because no practical methods have yet been developed or because a valid evaluation of the information resulting from existing unpublished methods requires an intimate and thorough knowledge of zippers.

6. Apparatus

6.1 The apparatus shall be as specified in Methods D2724.

6.2 *AATCC Chromatic Transference Scale,* as specified in AATCC Evaluation Procedure 3.

6.3 *Gray Scales for Color Change,* as specified in AATCC Evaluation Procedure 1.

6.4 *AATCC Multifiber Test Fabric* No. 10.[4]

6.5 *Undyed Cotton Twill Cloth,* weighing 270 ± 70 g/m^2 free of finishes.[4]

7. Sampling

7.1 *Lot Sample*—As a lot sample for acceptance testing, take at random the number of individual containers from each shipping carton as directed in an applicable material specification or other agreement between the purchaser and the supplier. Consider individual containers from each shipping carton to be the primary sampling units.

NOTE 2—An adequate specification or other agreement between the purchaser and supplier requires taking into account the variability between shipping cartons and between zippers in a container to provide a sampling plan with a meaningful producer's risk, consumer's risk, acceptable quality level, and limiting quality level.

7.2 *Laboratory Sample and Test Specimens*—As a laboratory sample for acceptance testing, take the number of zippers specified in Section8 at random from each container in the lot sample. Consider the zippers as both the laboratory sample and the test specimens.

8. Number of Specimens

8.1 Unless otherwise agreed upon, as when specified in an applicable material specification, take one zipper at random from each individual container selected for sampling.

9. Test Specimen

9.1 The test specimen shall consist of approximately 40 cm^2 (6.4 in.^{2}) of zipper stringer taken from each zipper sample. The specimen need not be a continuous length.

9.2 A duplicate specimen shall be prepared and held for comparison in evaluating the results of the test.

10. Conditioning

10.1 The specimens shall be conditioned for at least 4 h in the standard atmosphere for testing textiles prior to being subjected to the drycleaning procedure. Preconditioning is not necessary.

11. Procedure

11.1 Using AATCC multifiber test fabric No. 10 for one side and undyed cotton twill cloth for the other, prepare a bag with inside dimensions of 200 by 100 mm (8 by 4 in.) by sewing the two superimposed fabrics around three sides. Place the specimen flatly inside the bag. Close the bag by any convenient means such as sewing or stapling the open side.

11.2 Dryclean the specimen in the bag as directed in Procedure for Drycleaning D2724, 10.1 through 10.3.

11.3 Repeat the drycleaning procedure through two additional cycles, for a total of three cycles. Remove the specimens from the specimen bag and evaluate for color change and staining as directed in Section 12 of this test method.

12. Evaluation

12.1 Grade the textile portion of the specimens for change in color to the nearest one half rating unit as directed in AATCC Evaluation Procedure 1.

12.2 Grade the degree of staining of each stripe of the multifiber fabric to the nearest one half rating unit as directed in AATCC Evaluation Procedure 3.

13. Report

13.1 State that the specimens were tested as directed in ASTM Test Method D2052. Describe the material or product sampled, and the method of sampling used.

13.2 Report the following information:

13.2.1 Number of specimens tested,

13.2.2 Change in shade for each specimen as the noted grade on the AATCC Gray Scale for Color Change, and

13.2.3 Staining for each multifiber stripe on each specimen as the grade on the AATCC Chromatic Transference Scale.

14. Precision and Bias

14.1 *Interlaboratory Test Data*—An interlaboratory test was run in 1972 using AATCC Method 132 in which randomly

[4] Suitable material is available from Testfabrics, Inc., P.O. Drawer 0, Middlesex, NJ 08846.

drawn samples of two materials were tested in each of three laboratories. Each laboratory used two operators, each of whom tested 12 specimens of each material. Calculation of components of variance was felt to be inappropriate because of the restricted and discontinuous rating scale, the nonlinear relationship between the rating scale and color difference units and the increased variability in color difference units as the true value of the ratings decrease.

14.2 *Precision*—Based on the observations described in 14.1 and on long general practice in the trade, the half-step rating scale has been found to be satisfactory for determining the acceptability or non-acceptability of a given lot. A lot or consignment of zippers is generally considered as having a rating that is significantly worse than a specified value when a specimen from the lot or consignment has a rating for change in color that is more than one-half step below the specified rating on the AATCC Gray Scale for Color Change.

14.3 *Bias*—No justifiable statement can be made on the bias of Test Method D2052 for grading zipper assemblages for change in color during drycleaning since the true value of this property cannot be established by accepted referee methods.

15. Keywords

15.1 colorfastness; drycleaning; zipper