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AMERICAN SOCIETY FOR TESTING AND MATERIALS
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Standard Test Method for Colorfastness of Zippers to Light[1]

This standard is issued under the fixed designation D 2053; 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 the alteration in shade of the textile portion of zippers when exposed to light, regardless of the materials of manufacture.

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 concerns, if any, associated with its use. It is the responsibility of the user of this standard 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 Textiles[2]
D 2050 Terminology Relating to Zippers[2]
D 2051 Test Method for Durability of Finish of Zippers to Laundering[2]
D 2052 Test Method for Colorfastness of Zippers to Drycleaning[2]
D 2054 Test Method for Colorfastness of Zipper Tapes to Crocking[2]
D 2057 Test Method for Colorfastness of Zippers to Laundering[2]
D 2058 Test Method for Durability of Finish of Zippers to Drycleaning[2]
D 2059 Test Method for Resistance of Zippers to Salt Spray (Fog)[2]
D 2060 Test Method for Measuring Zipper Dimensions[2]
D 2061 Test Methods for Strength Tests for Zippers[2]
D 2062 Test Methods for Operability of Zippers[2]

2.2 *AATCC Methods:*

Test Method 16 Colorfastness to Light[3]
AATCC Gray Scale for Color Change[3]
Evaluation Procedure 1 Gray Scale for Color Change[3]

3. Terminology

3.1 *Definitions*—For definitions of zipper terms used in this standard, refer to Terminology D 2050. For definitions of other textile terminology used in this standard, refer to Terminology D 123.

4. Summary of Test Method

4.1 A specimen of zipper tape and chain is exposed to continuous artificial light for a predetermined period of exposure. Fading of the specimen is evaluated and rated by means of the AATCC Gray Scale for Color Change.

5. Significance and Use

5.1 Test Method D 2053 is useful for testing to determine if the loss of color due to light exposure is satisfactory for the intended end-use.

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.

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 a 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 test method(s) in this standard along with those in Test Methods D 2051, D 2052, D 2054, D 2057, D 2058, D 2059, D 2060, D 2061, and D 2062 are a collection of proven zipper test methods. They can be used as aids in the

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

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

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. Sampling and Test Specimens

6.1 *Primary Sampling Unit*—Consider individual containers from each shipping carton to be the primary sampling units.

6.2 *Laboratory Sampling Unit*—As a laboratory sampling unit, take at random one zipper from each primary sampling unit.

6.3 *Test Specimens*—As a test specimen, take approximately a 120-mm (4.75-in.) length of the laboratory sample that consists of the tape and chain.

7. Mounting the Test Specimen

7.1 Mount the specimen front face up, as prescribed in AATCC Test Method 16, with approximately half the specimen covered and the remainder exposed.

8. Procedure

8.1 Test the specimen for colorfastness as directed in AATCC Test Method 16.

NOTE 1—There are distinct differences in spectral distribution between the various types of machines listed in AATCC Test Method 16, with no overall correlations between them. Consequently, these machines cannot be used interchangeably. In case of controversy, results obtained with the water-cooled Xenon-arc machine listed in Option E shall prevail.

9. Interpretation of Results

9.1 Interpret the results of the test on the specimens as directed in AATCC Test Method 16 for the selected option, as appropriate, using the Classification Based on a Specified Number of Standard Fading Hours or AATCC Fading Units.

10. Report

10.1 State that the specimens were tested as directed in the Test Method D 2053. Describe the material or product sampled, and the method of sampling used.

10.2 Report the following information for the laboratory sampling unit and for the lot as applicable to a material specification or contract order.

10.2.1 Specify the AATCC Test Method 16 option used,

10.2.2 Number of specimens tested,

10.2.3 Degree of fading as standard fading hours or AATCC Fading Units, as appropriate, and

10.2.4 Degree of fading for each specimen as the appropriate grade on the AATCC Gray Scale for Color Change.

11. Precision and Bias

11.1 *Precision*—It is not possible to specify the precision of this test method because of the restricted and nonlinear relationships between the rating scales of color difference units, and the increased variability in color difference units as the true value of ratings decrease.

11.2 *Bias*—The procedure of this test method produces a test value that can be defined only in terms of a test method. There is no independent, referee method by which bias may be determined. This test method has no known bias.

12. Keywords

12.1 colorfastness; zipper