



Designation: D2053 – 99 (Reapproved 2022)

Standard Test Method for Colorfastness of Zippers to Light¹

This standard is issued under the fixed designation D2053; 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 SI units are to be regarded as standard. The values given in parentheses after SI units are provided for information only and are not considered standard.

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

D123 Terminology Relating to Textiles

D2050 Terminology Relating to Subassemblies Used in the Manufacture of Textiles

D2051 Test Method for Durability of Finish of Zippers to Laundering

D2052 Test Method for Colorfastness of Zippers to Dry-cleaning

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

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. This test method was developed in cooperation with the Slide Fastener Association, 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.

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

2.2 *AATCC Methods:*

Test Method 16 Colorfastness to Light³

AATCC Gray Scale for Color Change³

Evaluation Procedure 1 Gray Scale for Color Change³

3. Terminology

3.1 *Definitions*—For definitions of zipper terms used in this standard, refer to Terminology D2050. For definitions of other textile terminology used in this standard, refer to Terminology D123.

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 This test method is useful in determining 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 there 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

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

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 **D2051**, **D2052**, **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. 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 D2053. 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

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