Designation: D2051 – 14

Standard Test Method for Durability of Finish of Zippers to Laundering[1]

This standard is issued under the fixed designation D2051; 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 durability of the enamel or other decorative coating of a zipper when subjected to laundering.

1.2 *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:*[2]

D123 Terminology Relating to Textiles

D2050 Terminology Relating to Fasteners and Closures Used with Textiles

D2052 Test Method for Colorfastness of Zippers to Drycleaning

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

2.2 *AATCC Method:*

Method 61 Colorfastness to Washing, Domestic; and Laundering, Commercial: Accelerated[3]

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 Specimens are laundered in laboratory equipment at a low liquor-to-goods ratio under conditions of temperature, bleaching, and abrasive action that produce the effect of repeated launderings in a conveniently short time. The zipper coating is abraded by the throw, slide, and impact of an appropriate number of steel balls. The effects of the test on zipper coating are evaluated by noting the loss of coating on the zipper chain or components, or both.

5. Significance and Use

5.1 Test Method D2051 is useful for testing to determine the effect of repeated laundering on the appearance of the decorative coating of a zipper.

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 test 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 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 the standard along with those in Test Methods D2052, D2053, D2054, D2057, D2058, D2059, D2060, D2061, and D2062 are a collection of proven test methods. They can be used as aids in the evaluation of zippers without the need for a thorough knowledge of zippers. The

[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 Association, Inc.

Current edition approved Feb. 1, 2014. Published March 2014. Originally approved in 1961. Last previous edition approved in 2009 as D2051 – 03(2009). DOI: 10.1520/D2051-14.

[2] For referenced ASTM standards, visit the ASTM web site, 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 web site.

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

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

6.1 *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 1—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.

6.2 *Laboratory Sample and Test Specimens*—As a laboratory sample for acceptance testing, take at random two zippers from each shipping container in the lot sample. Consider the zippers as both the laboratory samples and the test specimens.

7. Test Specimen

7.1 The test specimen shall consist either of a completely assembled zipper or a length of chain. In either case, the length shall not be greater than 254 mm (10 in.). In the case of a completely assembled zipper that is longer than 254 mm, the specimen may be made up by cutting out and removing the central portion of the chain, and then securely attaching the cut ends together, using suitable noncorrosive materials such as sewing thread or stainless steel staples. If it is desired to test the entire length of a long zipper, it should be cut into parts 254 mm or less in length and these parts tested separately.

8. Conditioning

8.1 No special environmental conditions are required.

9. Procedure

9.1 Test each specimen as directed in AATCC Method 61, Paragraph 7 Procedure, using Test Condition 3A.

10. Interpretation of Results

10.1 Interpret the test results by visually examining the chain and components for exposed base metal and comparing the observations to samples illustrating an acceptable degree of coating loss as agreed upon between the purchaser and the supplier.

11. Report

11.1 State that the specimens were tested as directed in Test Method D2051 according to AATCC Method 61, Paragraph 7 Procedure, using Test Condition 3A. Describe the material or product sampled, and the method of sampling used.

11.2 Report the following information:

11.2.1 Number of specimens tested (if more than one test cycle is required by agreement, report the number of test cycles), and

11.2.2 Number of specimens equal to or not equal to the agreed upon standard.

12. Precision and Bias

12.1 No justifiable statistical statement can be made on either the precision or the bias of the procedures in testing coating resistance to abrasion in laundering since the test merely states whether there is conformance to an agreed upon standard.

13. Keywords

13.1 durability; laundering; zipper