



Designation: D2062 – 03 (Reapproved 2021)

Standard Test Methods for Operability of Zippers¹

This standard is issued under the fixed designation D2062; 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 These test methods cover procedures for determining the following characteristics of zippers:

	Sections
Opening and Closing of Zippers	14 – 17
Separator Functioning of Zippers	18 – 22
Sticking of Zippers at Stops	10 – 13

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

1.3 *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 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/D2059M 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](#)

3. Terminology

3.1 Definitions:

3.1.1 For definitions of zipper terms used in these test methods, refer to Terminology [D2050](#). For definitions of other textile terminology used in these test methods, refer to Terminology [D123](#).

4. Significance and Use

4.1 The significance of specific tests is discussed in the appropriate sections.

4.2 These test methods are considered satisfactory for acceptance testing of commercial shipments of zippers because the methods have been used extensively in the trade for this purpose, even though current estimates of between-laboratory precision are quite large in some cases.

4.2.1 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.

4.3 The method(s) in the standard along with those in Test Methods [D2051](#), [D2052](#), [D2053](#), [D2054](#), [D2057](#), [D2058](#), [D2059/D2059M](#), [D2060](#), and [D2061](#) 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 enumerated test methods do not provide for the evaluation

¹ These test methods are under the jurisdiction of ASTM Committee [D13](#) on Textiles and are the direct responsibility of Subcommittee [D13.54](#) on Subassemblies. The methods were developed in cooperation with the Slide Fastener Assn., Inc.

Current edition approved July 1, 2021. Published July 2021. Originally approved in 1961. Last previous edition approved in 2014 as D2062 – 03(2014). DOI: 10.1520/D2062-03R21.

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.

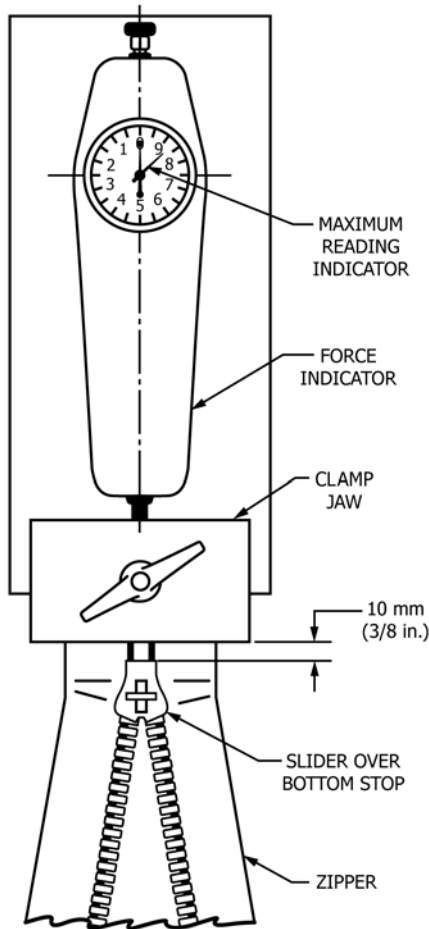


FIG. 1 Slider Sticking on Bottom Stop

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.

5. Apparatus

5.1 Force Indicator³ (Fig. 1)—A 50 N or 10 lbf capacity force indicator equipped with a direct-reading dial graduated in 0.5 N or 0.1 lbf divisions, a maximum-reading indicator, and a clamp suitable for attaching the zipper tape ends to the indicator.

5.2 Spacer—A piece of metal designed to fit in the pin cavity of the fixed retainer of the specimen and having a length equal to the element pitch of the specimen.

5.3 Hooks, suitable for attaching the force indicator to the slider pull of a specimen.

³ Drawings for the force indicator fixture shown is available from the various zipper manufacturers upon request.

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 a number of zippers specified in Section 6 at random from each container in the lot sample. Consider the zippers as both the laboratory sample and the test specimens.

7. Number of Specimens

7.1 Variables—Take a number of zippers per individual container from each shipping carton such that the user may expect at the 90 % probability level that the test result for an individual container is no more than 10 % of the average above or below the true average for the individual container. Determine the number of zippers per individual container as follows:

7.1.1 Reliable Estimate of v —When there is a reliable estimate of v based upon extensive past records for similar materials tested in the users laboratory as directed in the method, calculate the number of specimens using Eq 1:

$$n = (t^2 \times v^2) / A^2 = 0.0270 \times v^2 \quad (1)$$

where:

- n = number of specimens (rounded upward to a whole number),
- v = reliable estimate of the coefficient of variation of individual observations on similar materials in the users laboratory under conditions of single-operator precision,
- t = 1.645, the value of student's t for infinite degrees of freedom, for two-sided limits, and a 90 % probability level ($t^2 = 2.706$),
- A = 10.0 % of the average, the value of the allowable variation, and
- 0.0270 = value calculated from t^2/A^2 .

7.1.2 No Reliable Estimate of v —When there is no reliable estimate of v for the users laboratory, Eq 1 should not be used directly. Instead, specify the fixed numbers of specimens shown in Table 1. These numbers of specimens are calculated using values of v which are listed in Table 1 and which are somewhat larger values of v than are usually found in practice. When a reliable estimate of v for the users laboratory becomes available, Eq 1 will usually require fewer specimens than are listed in Table 1.

7.2 Attribute Properties—Unless otherwise agreed upon, as when specified in an applicable material specification, take the fixed number of 20 specimens for detecting slider movement with the pin partially seated or not seated.