



# Standard Performance Specification for Zippers for Dungarees, Jeans and Work Trousers<sup>1</sup>

This standard is issued under the fixed designation D4465; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This performance specification covers zippers to be used as fly closures in dungarees, jeans and work trousers made from heavy denim or other durable fabric, approximately 475 g/m<sup>2</sup> (14 oz/yd<sup>2</sup>).

1.2 Zippers covered by this specification may be satisfactory for lighter weight denim and other fabrics.

1.2.1 When lighter weight material is being used, consideration should be given to the zipper size and slider type because of their effect on the appearance of the zipper installation area.

1.3 The values stated in SI units are to be regarded as the standard. The values in parentheses are for information only.

## 2. Referenced Documents

2.1 *ASTM Standards*:<sup>2</sup>

D123 Terminology Relating to Textiles

D2050 Terminology Relating to Fasteners and Closures Used with Textiles

D2057 Test Method for Colorfastness of Zippers to Laundering

D2060 Test Methods for Measuring Zipper Dimensions

D2061 Test Methods for Strength Tests for Zippers

D2062 Test Methods for Operability of Zippers

D2905 Practice for Statements on Number of Specimens for Textiles (Withdrawn 2008)<sup>3</sup>

## 3. Terminology

3.1 *Definitions*:

3.1.1 *denim, n*—a durable woven twill fabric, usually of all cotton or a blend of cotton and man-made fibers, made from a variety of yarn numbers, and in various fabric weights, colors, designs, and finishes.

<sup>1</sup> This performance specification is under the jurisdiction of ASTM Committee D13 on Textiles and is the direct responsibility of Subcommittee D13.54 on Subassemblies. This performance specification was developed in cooperation with the Slide Fastener Association, Inc.

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<sup>2</sup> 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.

<sup>3</sup> The last approved version of this historical standard is referenced on www.astm.org.

3.1.1.1 *Discussion*—Traditionally, denim is made with indigo blue dyed cotton warp and undyed or tinted filling. Denim fabrics are used for many types of garments including work clothes, sportswear, dresswear, and home furnishings.

3.2 *Definitions of Terms Specific to This Standard*:

3.2.1 *jeans, n*—a style of trousers made of a twill fabric used as sportswear and work clothing.

3.2.2 *dungaree, n*—trousers made from denim and designed for general heavy work wear.

3.2.3 *trouser, n*—a garment that closes at the waist and covers the lower body to the crotch and each leg from the waist to the ankle.

3.3 For other textile terminology used in this specification, refer to Terminology D123. For definitions of zipper terms used in this specification, refer to Terminology D2050.

## 4. Specification Requirements

4.1 The properties of zippers for dungarees, jeans and work trousers shall conform to the specification requirements in Table 1.

## 5. Significance and Use

5.1 This specification serves as a guide for the purchase of zippers to be used for dungarees, jeans or work trousers.

5.2 Upon agreement between the purchaser and the supplier, zippers intended for this end-use should meet all of the requirements listed in Table 1 of this specification.

5.3 It is recognized that for purposes of fashion or aesthetics the ultimate consumer may find acceptable dungarees, jeans or work trousers, having zippers that do not conform to all of the requirements in Table 1. Therefore, one or more of the requirements listed in Table 1 may be modified by agreement between the purchaser and the supplier.

5.3.1 In such cases, and references to this specification shall specify that: This zipper meets Performance Specification D4465 except for the following characteristic(s).

5.4 Where no prepurchase agreement has been reached between the purchaser and the supplier, and in case of controversy, the requirements listed in Table 1 are intended to be used as a guide only. As noted in 5.3 ultimate consumer demands dictate varying performance parameters for any particular style of zipper.

**TABLE 1 Specification Requirements for Zippers for Dungaree, Jeans and Work Trousers**

Characteristics	Requirement	Section
Element pull-off	62 N (14 lbf), min	7.1
Element slippage	44 N (10 lbf), min	7.2
Crosswise strength	578 N (130 lbf), min	7.3
Bottom stop holding—stringer separation	111 N (25 lbf), min	7.4
Top stop holding	111 N (25 lbf), min	7.5
Slider lock holding		
Positive lock	111 N (25 lbf), min	7.6
Ratchet lock	31 N (7 lbf), min	7.6
Slider deflection and recovery—Pull Method:		
Deflection	0.254 mm (0.010 in.), max	7.7
Permanent set	0.127 mm (0.005 in.), max	
Resistance to pull-off of slider pull	111 N (25 lbf), min	7.8
Operability	6.7 N (1.5 lbf), max	7.9
Longitudinal Dimensional Change—Laundering:		
Normal shrinkage level	3.5 % max	7.10
Low shrinkage level	1.5 % max	7.10
Colorfastness to laundering		
Color change	3.5 min	7.11
Staining	3.5 min	7.11

5.5 The uses and significance of particular properties and test methods are discussed in the appropriate sections of the specified test methods.

## 6. Sampling

6.1 *Description of Lots*—Unless there is prior agreement, consider as a lot for acceptance testing all material of a single item received as a single shipment.

6.2 *Lot Samples and Laboratory Samples*—For acceptance testing, take lot samples and laboratory samples as directed in each of the applicable test methods.

6.3 *Test Specimens*—Take the number of specimens directed in each of the applicable test methods. Take the specimens, and perform the tests on zippers as received by the garment manufacturer or on zippers removed from unused garments.

6.3.1 If the method does not specify the number of specimens and there has been no prior agreement, use the procedures in Practice D2905 to determine the number of specimens per unit in the laboratory sample when using a reliable estimate of the variability of individual observations on similar materials in the user's laboratory under conditions of single-operator precision. The number of specimens per unit in the laboratory sample shall be such that the user may expect at the 95 % probability level that each test result is not more than 5 % of the average above or below the true average for the unit in the laboratory sample.

## 7. Test Methods

7.1 *Element Pull-Off*—Determine the resistance of the element to being pulled from the tape as directed in Test Methods D2061.

7.2 *Element Slippage*—Determine the element resistance to slippage as directed in Test Methods D2061.

7.3 *Crosswise Strength*—Determine the crosswise strength of the chain as directed in Test Methods D2061.

7.4 *Bottom Stop Holding-Stringer Separation*—Determine the bottom stop holding-stringer separation strength as directed in Test Methods D2061.

7.5 *Top Stop Holding*—Determine the top stop holding strength as directed in Test Methods D2061.

7.6 *Slider Lock Holding*—Determine the holding strength of the slider lock as directed in Test Methods D2061.

7.7 *Slider Deflection and Recovery-Pull*—Determine the deflection and recovery for the slider as directed in Test Methods D2061.

7.8 *Resistance to Pull-Off of Slider Pull*—Determine the resistance of the slider pull to pull-off as directed in Test Methods D2061.

7.9 *Operability*—Determine the ease of slider operation on the chain as directed in Test Methods D2062.

7.10 *Longitudinal Dimensional Change-Laundering*—Determine the longitudinal dimensional change of the zipper as measured on the tape after laundering as directed in Test Methods D2060.

7.11 *Colorfastness to Laundering*—Determine the colorfastness of the textile portion of the zipper to laundering as directed in Test Method D2057.

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