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Standard Performance Specification for Zippers for Denim Dungarees[1]

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1. Scope

1.1 This performance specification covers zippers to be used as fly closures in dungarees made from heavy denim, approximately 475 g/m^2 (14 oz/yd^2).

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 other acceptable metric units or in other units shall be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system must be used independently of the other, without combining values in any way.

2. Referenced Documents

2.1 *ASTM Standards:*

D 123 Terminology Relating to Textiles[2]

D 2050 Terminology Relating to Zippers[2]

D 2057 Test Method for Colorfastness of Zippers to Laundering[2]

D 2060 Test Methods for Measuring Zipper Dimensions[2]

D 2061 Test Methods for Strength Tests for Zippers[2]

D 2062 Test Methods for Operability of Zippers[2]

D 2905 Practice for Statements on Number of Specimens for Textiles[2]

D 3657 Specification for Zipper Dimensions[3]

D 4109 Performance Specification for Men's and Boys' Woven Coverall, Dungaree, Overall, and Shop-Coat Fabrics[3]

D 4118 Performance Specification for Women's Woven Coverall, Dungaree, Overall, and Shop Coat Fabrics[3]

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.

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

3.2.2 *trouser*, *n*—an outerwear garment that covers the body from the waist down and is divided so as to make a separate covering for each leg.

3.3 For other textile terminology used in this specification, refer to Terminology D 123. For definitions of zipper terms used in this specification, refer to Terminology D 2050.

4. Specification Requirements

4.1 The properties of zippers for denim dungarees 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 denim dungarees.

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 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 D 4465 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.

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

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

[3] *Annual Book of ASTM Standards*, Vol 07.02.

TABLE 1 Specification Requirements for Zippers for Denim Dungarees

Characteristics	Requirement	Section
Element pull-off	53 N (12 lbf), min	7.1
Element slippage	40 N (9 lbf), min	7.2
Crosswise strength	444 N (100 lbf), min	7.3
Bottom stop holding—stringer separation	80 N (18 lbf), min	7.4
Top stop holding	80 N (18 lbf), min	7.5
Slider lock holding		
Positive lock	80 N (18 lbf), min	7.6
Ratchet lock	31 N (7 lbf), min	7.6
Slider deflection and recovery—Pull Method:		
Deflection	0.381 mm (0.015 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	5 % max	7.10
Low shrinkage level	3 % max	7.10
Colorfastness to laundering		
Color change	3 min	7.11
Staining	3 min	7.11

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 D 2905 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 D 2061.

7.2 *Element Slippage*—Determine the element resistance to slippage as directed in Test Methods D 2061.

7.3 *Crosswise Strength*—Determine the crosswise strength of the chain as directed in Test Methods D 2061.

7.4 *Bottom Stop Holding-Stringer Separation*—Determine the bottom stop holding-stringer separation strength as directed in Test Methods D 2061.

7.5 *Top Stop Holding*—Determine the top stop holding strength as directed in Test Methods D 2061.

7.6 *Slider Lock Holding*—Determine the holding strength of the slider lock as directed in Test Methods D 2061.

7.7 *Slider Deflection and Recovery-Pull*—Determine the deflection and recovery for the slider as directed in Test Methods D 2061.

7.8 *Resistance to Pull-Off of Slider Pull*—Determine the resistance of the slider pull to pull-off as directed in Test Methods D 2061.

7.9 *Operability*—Determine the ease of slider operation on the chain as directed in Test Methods D 2062.

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 D 2060.

7.11 *Colorfastness to Laundering*—Determine the colorfastness of the textile portion of the zipper to laundering as directed in Test Method D 2057.