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Standard Test Method for Bursting Strength of Knitted Goods—Constant-Rate- of-Traverse (CRT) Ball Burst Test¹

This standard is issued under the fixed designation D 3787; 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 bursting strength of knit fabrics or garments that exhibit a high degree of ultimate elongation. It is not recommended for woven fabrics or garments made from woven fabrics.

NOTE 1—For the measurement of bursting strength with a hydraulic testing machine, refer to Test Method D 3786.

1.2 *This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety problems 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:

- D 76 Specification for Tensile Testing Machines for Textiles^{2,3}
- D 123 Terminology Relating to Textiles^{2,3}
- D 1776 Practice for Conditioning Textiles for Testing^{2,3}
- D 3786 Test Method for Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics—Diaphragm Bursting Strength Tester Method²

3. Terminology

3.1 Definitions

3.1.1 *constant-rate-of-traverse tensile testing machine (CRT), n*—a testing machine in which the pulling clamp moves at a uniform rate and the load is applied through the other clamp which moves appreciably to actuate a weighing mechanism, so that the rate of increase of load or elongation is dependent upon the extension characteristics of the specimen.

3.1.2 *fabric, knitted, n*—a structure produced by inter-looping one or more ends of yarn or comparable material.

3.1.3 *fabric, nonwoven, n*—a textile structure produced by bonding or interlocking of fibers, or both, accomplished by mechanical, chemical, or solvent means and combinations thereof.

3.1.4 *strength, bursting, n*—the force or pressure required to rupture a textile by distending it with a force, applied at right angles to the plane of the fabric, under specified conditions.

3.1.4.1 *Discussion*—The angle of application of force, and the area of the fabric upon which the force is applied varies continuously as the fabric stretches when it is tested as directed in this method.

3.5 For definitions of other textile terms used in this method refer to Terminology D 123.

4. Summary of Test Method

4.1 A specimen of the fabric or garment is securely clamped without tension between grooved, circular plates of the ball burst attachment secured to the pulling (movable) jaw for the constant-rate-of-traverse (CRT) testing machine. A force is exerted against the specimen by a polished, hardened steel ball that is attached to the pendulum-actuating (fixed) clamp of the machine, until rupture occurs.

5. Significance and Use

5.1 This test method for the determination of ball bursting strength of knitted goods is being used by the textile industry for the evaluation of a wide variety of fabrics.

5.2 Although test results obtained using the procedures in Test Method D 3787 have not been correlated with actual performance, Test Method D 3787 is considered satisfactory for acceptance testing of commercial shipments of knitted fabrics for bursting strength since the method has been used extensively in the trade for acceptance testing. In cases of disagreement arising from differences in values reported by the purchaser and the seller when using Test Method D 3787 for acceptance testing, the statistical bias, if any, between the laboratory of the purchaser and the laboratory of the seller should be determined with comparison based on testing specimens randomly drawn from one sample of material of the type being evaluated.

NOTE 2—The kind of load transfer and stretch that occur when knitted goods are worn is prevented by clamping them as directed in this test method.

6. Apparatus

6.1 *Constant-Rate-of-Traverse Tensile Testing Machine (CRT)*, as specified in Specification D 76, with a ball-burst attachment replacing the clamp assembly.

6.2 *Ball-Burst Attachment*,⁴ consisting of an attachment having a polished steel ball that replaces the fixed clamp of the tensile tester and of a ring-clamp mechanism that replaces the pulling (moving) clamp of the tensile tester (see

¹ This test method is under the jurisdiction of ASTM Committee D-13 on Textiles and is the direct responsibility of Subcommittee D13.59 on Fabric Test Methods, General.

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² Annual Book of ASTM Standards, Vol 07.01.

³ Annual Book of ASTM Standards, Vol 07.02.

⁴ The Ball Bursting Attachment, manufactured by the Scott Tester Co., Inc., a division of GCA Precision Scientific, 3737 West Cortland St., Chicago, IL 60647, or equivalent, has been found satisfactory.