



Standard Test Method for Tensile Properties of Yarns by the Single-Strand Method¹

This standard is issued under the fixed designation D2256/D2256M; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 This test method covers the determination of tensile properties of monofilament, multifilament, and spun yarns, either single, plied, or cabled with the exception of yarns that stretch more than 5.0 % when tension is increased from 0.05 to 1.0 cN/tex [0.5 to 1.0 gf/tex].

1.2 This test method covers the measurement of breaking force and elongation of yarns and includes directions for the calculation of breaking tenacity, initial modulus, chord modulus, and breaking toughness.

1.2.1 Options are included for the testing of specimens in: (A) straight, (B) knotted, and (C) looped form.

1.2.2 Conditions of test are included for the testing of specimens that are: (1) conditioned air, (2) wet, not immersed, (3) wet, immersed, (4) oven-dried, (5) exposed to elevated temperature, or (6) exposed to low temperature.

NOTE 1—Special methods for testing yarns made from specific fibers; namely, glass, flax, hemp, ramie, and kraft paper and for specific products; namely, tire cords and rope, have been published: Test Methods **D885**, and Specification **D578**.

NOTE 2—For directions covering the determination of breaking force of yarn by the skein method refer to Test Method **D1578**.

1.3 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

1.4 *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

- D76** Specification for Tensile Testing Machines for Textiles
- D123** Terminology Relating to Textiles
- D578** Specification for Glass Fiber Strands
- D885** Test Methods for Tire Cords, Tire Cord Fabrics, and Industrial Filament Yarns Made from Manufactured Organic-Base Fibers
- D1578** Test Method for Breaking Strength of Yarn in Skein Form
- D1776** Practice for Conditioning and Testing Textiles
- D2258** Practice for Sampling Yarn for Testing
- D2904** Practice for Interlaboratory Testing of a Textile Test Method that Produces Normally Distributed Data (Withdrawn 2008)³
- D2906** Practice for Statements on Precision and Bias for Textiles (Withdrawn 2008)³
- D4848** Terminology Related to Force, Deformation and Related Properties of Textiles
- D4849** Terminology Related to Yarns and Fibers
- E178** Practice for Dealing With Outlying Observations

3. Terminology

3.1 Definitions:

3.1.1 Refer to Terminology **D4848** for definitions of the following terms used in this standard: breaking force, breaking strength, breaking tenacity, breaking toughness, chord modulus, elongation, elongation at break, elongation at rupture, initial modulus, knot-breaking force, knot breaking strength, linear density, loop breaking force, loop-breaking strength, single-strand breaking force, single-strand breaking strength, strength and tenacity.

3.1.2 Refer to Terminology **D123** and Terminology **D4849** and for definitions of other terms used in this standard.

¹ This test method is under the jurisdiction of ASTM Committee **D13** on Textiles and is the direct responsibility of Subcommittee **D13.58** on Yarns and Fibers.

Current edition approved July 1, 2015. Published September 2015. Originally approved in 1964. Last previous edition approved in 2010 as D2256 – 10^{ε1}. DOI: 10.1520/D2256_D2256M-10R15.

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.

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