



Designation: D885/D885M – 25

Standard Test Methods for Tire Cords, Tire Cord Fabrics, and Industrial Filament Yarns Made from Manufactured Organic-Base Fibers¹

This standard is issued under the fixed designation D885/D885M; 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 standard covers the testing of industrial yarns wholly made of manufactured organic-based fibers; twisted cords made of these yarns; fabrics woven from these twisted cords; and other structures made specifically for use in manufacture of pneumatic tires.

1.1.1 These test methods can also be applicable when these yarn structures are used for reinforcing other rubber goods and fabrics made with these cords.

1.1.2 The test methods are relevant for evaluating various yarns: nylon, polyester, and rayon yarns; tire cords twisted from these yarns, and fabrics made from these yarns.

1.2 The sections on “Growth of Conditioned Yarns and Cords,” “Properties of Yarns and Cords at Elevated Temperature,” and “Properties of Wet Yarns and Cords” have been moved to **Appendix X1 – Appendix X3** as non-mandatory informational items because of their very limited use by the industry and because precision and bias statements are not included.

1.3 This standard includes the following sections:

Adhesion of Cord to Elastomers	Section 34
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Breaking Strength (Force) of Yarns and Cords at Elevated Temperature	X2.3
Breaking Force of Conditioned Yarns and Cords	16
Breaking Force of Oven-Dried Rayon Yarns and Cords	23
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Breaking Tenacity of Conditioned Yarns and Cords	18
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Breaking Toughness of Yarns and Cords	28
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Count of Tire Cord Fabric	37
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Mass of per Unit Area of Tire Cord Fabric	36
Modulus of Conditioned Yarns and Cords	22
Moisture Regain, Actual	10
Precision and Bias of Certain Yarn and Cord Tests	39
Properties of Tire Cord Fabric	35 to 38
Sampling	6
Shrinkage Force of Conditioned Yarns and Cords at Elevated Temperature	X2.5
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SI Calculations (examples for work-to-break, specific work-to-break, and breaking toughness)	Appendix X4
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Width of Tire Cord Fabric	35
Work-to-Break of Yarns and Cords	27

1.4 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.

1.5 *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 These test methods are under the jurisdiction of ASTM Committee D13 on Textiles and are the direct responsibility of Subcommittee D13.19 on Industrial Fibers and Metallic Reinforcements.

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1.6 *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

- D76 Specification for Tensile Testing Machines for Textiles
- D123 Terminology Relating to Textiles
- D276 Test Methods for Identification of Fibers in Textiles (Withdrawn 2021)³
- D1423 Test Method for Twist in Yarns by Direct-Counting
- D1776 Practice for Conditioning and Testing Textiles
- D1777 Test Method for Thickness of Textile Materials
- D1907 Test Method for Linear Density of Yarn (Yarn Number) by the Skein Method
- D1909 Standard Tables of Commercial Moisture Regains and Commercial Allowances for Textile Fibers
- D2257 Test Method for Extractable Matter in Textiles
- D2258 Practice for Sampling Yarn for Testing
- D2462 Test Method for Moisture in Wool by Distillation With Toluene
- D2494 Test Method for Commercial Mass of a Shipment of Yarn or Manufactured Staple Fiber or Tow
- D2654 Test Methods for Moisture in Textiles
- D3774 Test Method for Width of Textile Fabric
- D3775 Test Method for End (Warp) and Pick (Filling) Count of Woven Fabrics
- D3776 Test Methods for Mass Per Unit Area (Weight) of Fabric
- D3888 Terminology for Yarn Spinning Systems
- D4393 Test Method for Strap Peel Adhesion of Reinforcing Cords or Fabrics to Rubber Compounds
- D4776 Test Method for Adhesion of Tire Cords and Other Reinforcing Cords to Rubber Compounds by H-Test Procedure
- D4848 Terminology Related to Force, Deformation and Related Properties of Textiles
- D4850 Terminology Relating to Fabrics and Fabric Test Methods
- D6477 Terminology Relating to Tire Cord, Bead Wire, Hose Reinforcing Wire, and Fabrics
- D7269 Test Methods for Tensile Testing of Aramid Yarns

3. Terminology

3.1 Definitions:

3.2 The following terms are relevant to this standard: breaking force; breaking strength; breaking tenacity; cord; cord twist; dip; dip pickup; elongation; fabric; growth; industrial yarn; initial modulus; moisture equilibrium for testing, *for*

industrial yarns and tire cords; pneumatic tire; specific work-to-break; twist; standard atmosphere for testing textiles; tabby sample; tire; tire cord fabric; and work-to-break.

3.2.1 For definitions of these terms and others relating to tire cord, bead wire, hose reinforcing wire, and fabrics, refer to Terminology D6477.

3.3 The following term is relevant to this standard: twist.

3.3.1 For the definition of this term and others related to yarn spinning systems, refer to Terminology D3888.

3.4 The following terms are relevant to this standard: breaking toughness; chord modulus; force -at -specific -elongation (FASE); linear density; tensile strength.

3.4.1 For definitions of these terms and others relating to force, deformation and related properties of textiles, refer to Terminology D4848.

3.5 The following term is relevant to this standard: stiffness.

3.5.1 For the definition of this term and others relating to fabrics and fabric test methods, refer to Terminology D4850.

3.6 For definitions of other terms related to textiles, refer to Terminology D123.

4. Summary of Test Methods, General

4.1 A summary of the directions prescribed for the determination of specific properties is stated in the appropriate sections of specific test methods.

5. Significance and Use, General

5.1 The procedures in these test methods should be used with caution for acceptance of commercial shipments owing to the absence of factual information on the between-laboratory precision of many of the test procedures included in these test methods. It is recommended that any program of acceptance testing be preceded by an interlaboratory check in the laboratory of the purchaser and the laboratory of the supplier on replicate specimens of the materials to be tested for each property (or properties) to be evaluated.

5.1.1 If there are differences of practical significance between reported test results for two laboratories (or more), comparative tests should be performed to determine if there is a statistical bias between them, using competent statistical assistance. As a minimum, 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.

5.2 The significance and use of particular properties are discussed in the appropriate sections of specific test methods.

6. Sampling

6.1 Yarn:

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at www.astm.org/contact. 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.