



Designation: D8054/D8054M – 22

Standard Test Methods for Tensile Testing of Para-Aramid Flat Yarns¹

This standard is issued under the fixed designation D8054/D8054M; 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 These test methods cover the tensile testing of para-aramid flat yarns. The methods include testing procedure only and include no specifications or tolerances.

1.2 This standard includes the following test methods:

	Section
Linear Density	10
Force at Specified Elongation (FASE)	11
Modulus	11

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 are not necessarily exact equivalents; therefore, to ensure conformance with the standard, each system shall be used independently of the other, and values from the two systems shall not be combined.

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.5 *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
D1776/D1776M Practice for Conditioning and Testing Textiles
D1907/D1907M Test Method for Linear Density of Yarn (Yarn Number) by the Skein Method

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.

Current edition approved Nov. 1, 2022. Published November 2022. DOI: 10.1520/D8054_D8054M-22.

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.

D2258 Practice for Sampling Yarn for Testing

D3800 Test Method for Density of High-Modulus Fibers

D4848 Terminology Related to Force, Deformation and Related Properties of Textiles

D6477 Terminology Relating to Tire Cord, Bead Wire, Hose Reinforcing Wire, and Fabrics

D6587 Test Method for Yarn Number Using Automatic Tester

D7269 Test Methods for Tensile Testing of Aramid Yarns

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods

3. Terminology

3.1 The following terms are relevant to this standard: elongation, flat yarn, force at specified elongation (FASE), force-elongation curve, modulus.

3.2 For definitions of terms related to industrial fibers and metallic reinforcements, see Terminology D6477.

3.3 For definitions of terms related to force and deformation in textiles, refer to Terminology D4848.

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

4. Summary of Test Methods

4.1 Using various test methods and protocols identified in the procedures, this standard determines the tensile strength, force at specified elongation (FASE), linear density and modulus of para-aramid flat yarns.

5. Significance and Use

5.1 For application areas such as optical fiber and cable reinforcements, aramid is usually used in a linear – not twisted – form. For designing constructions like this, it is essential to use data based on a specimen without twist applied.

5.1.1 The modulus and FASE of twisted yarns demonstrate reduced values when compared to p-aramid flat yarns.

5.1.2 Use Test Method D7269 for testing of twisted p-aramid yarns.

5.2 The levels of tensile properties obtained when testing aramid yarns are dependent on the age and history of the