Designation: D8054/D8054M – 16

Standard Test Methods for Tensile Testing of Para-Aramid Flat Yarns[1]

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.

1.1.1 This standard includes procedures used to measure force at specified elongation (FASE) of para-aramid flat yarns.

1.1.2 This standard includes procedures used to measure linear density of para-aramid flat yarns.

1.1.3 This standard includes procedures to determine modulus of para-aramid flat yarns.

1.2 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.

1.3 *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

D1776/D1776M Practice for Conditioning and Testing Textiles

D1907/D1907M Test Method for Linear Density of Yarn (Yarn Number) by the Skein Method

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 *Definitions:*

3.1.1 *flat yarn, n*—continuous filament yarns which, when removed from processing package are fully drawn, without twist and untextured.

3.1.1.1 *Discussion*—Flat yarn is either extruded in this form or it could be made as a slit cut structure with no additional processing modifying the extension direction of the individual elements (for example, filaments) in the yarn.

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

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

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

3.5 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 elonation (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.

[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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[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.

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