



Designation: D8395 – 23

Standard Specification for Aramid Fiber for Asphalt Mixtures¹

This standard is issued under the fixed designation D8395; 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 standard specification covers a standardized method whereby an aromatic polyamide fiber can be evaluated prior to modification where the finished product (formulation of aramid fiber plus some form of treatment) is to be used in asphalt mixtures. The aromatic, polyamide fiber (shortened to “aramid” in non-treated form) can be specified by physical and mechanical properties whereby the aramid fiber is treated and the final product form is used in asphalt mixtures. The purpose of adding aramid fiber is to improve the asphalt mixture’s mechanical performance. Aramid fiber may provide structural properties to the mixture and thus is different than fibers such as cellulose fibers that are used to prevent drain down. The aramid fiber may be coated (that is, “treated”) with a binder such as wax, emulsion, or similar. The fiber can also be blended with a polyolefin fiber or other additive to reduce loss of fibers into the airstream during mixing due to the lightweight nature of aramid fiber. The mechanical properties listed in the standard specification are for the non-treated aramid fiber since it is difficult to test shortened fibers for properties such as linear density, tensile strength, and Young’s modulus.

1.2 This standard specification does not address the performance of asphalt binder blends with aramid fiber or that of the asphalt mixture containing aramid fiber, but rather specifies the aramid fiber properties for use in formulating the finished product which is then used in asphalt mixtures.

1.3 *Units*—The values stated in International System of Units (SI) are to be regarded as standard. No other units of measurement are included in this standard.

1.4 The text of this standard references notes and footnotes which provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of 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 appro-*

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

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

D8 Terminology Relating to Materials for Roads and Pavements

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

D2256/D2256M Test Method for Tensile Properties of Yarns by the Single-Strand Method

D2258/D2258M Practice for Sampling Yarn for Testing

D7269/D7269M Test Methods for Tensile Testing of Aramid Yarns

E1131 Test Method for Compositional Analysis by Thermogravimetry

3. Terminology

3.1 *Definitions*—Definitions for many terms common to asphalt binder and asphalt mixtures are found in Terminology D8.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *non-treated aramid fiber, n*—a class of heat-resistant, lightweight, high-strength synthetic fibers with molecules that are relatively rigid polymer chains formed from monomers linked via covalent bonding.

3.2.1.1 *Discussion*—The term “aramid” is short for aromatic polyamide or para-aramid. Aramid fibers derive their properties from crystalline domains of poly (p-phenylene terephthalamide) (PPTA). The microstructure of aramid fibers reveals elongated highly crystalline fibrils in which the PPTA chains are aligned along the fibril length forming stacked PPTA sheets. PPTA crystal structure is highly anisotropic along the

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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.