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.

Designation: D4724/D4724M – 20

Standard Test Method for Entanglements in Filament Yarns by Needle Insertion[1]

This standard is issued under the fixed designation D4724/D4724M; 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 test method covers two options for the measurement of entanglements in filament yarns using needle insertion options for instrument (Option 1) (Option 2) techniques.

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 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.

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

1.4 *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]

D123 Terminology Relating to Textiles
D1776 Practice for Conditioning and Testing Textiles
D2258 Practice for Sampling Yarn for Testing
D4849 Terminology Related to Yarns and Fibers

3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of terms relating to yarns and fibers, refer to Terminology D4849.

3.1.1.1 The following terms are relevant to this standard: entanglement, filament yarn.

3.2 For definitions of other textile terms used in this test method, refer to Terminology D123.

4. Summary of Test Method

4.1 A summary of each option is in the section for that option.

5. Significance and Use

5.1 Option 1 of this test method is for the determination of the degree of filament yarn entanglement, as measured instrumentally. It is used for acceptance testing of commercial shipments; however, caution is advised because information on between-laboratory precision is lacking. Comparative tests, as directed in 5.1.1, may be advisable.

5.1.1 If there are differences of practical significance between the reported test results for two or more laboratories, comparative tests should be performed by those laboratories to determine if there is a statistical bias between them, using competent statistical assistance. As a minimum, samples used for each comparative test should be as homogeneous as possible, drawn from the same lot of material as the samples that results in disparate results during initial testing, and randomly assigned in equal numbers to each laboratory. Other fabrics with established test values may be used for this purpose. The test results from the laboratories involved should be compared statistically. 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 Option 2 for this test method is intended for use when the supply of yarn is limited.

5.3 The instrumental option of this test method, Option 1, is based on the total randomization of the entanglements in the yarn; therefore, the distance measured between the point of insertion of a pin in the middle of the yarn and the point at which an entanglement is encountered, by movement of the yarn or the pin until it is stopped at a preset level of force, is representative of the distance between two entanglements at some location in the yarn.

5.4 Entanglements are used frequently instead of twist to ensure the integrity of filament yarns. Such entanglements

[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 April 1, 2020. Published June 2020. Originally approved in 1999. Last previous edition approved in 2011 as D4724–11. DOI: 10.1520/D4724_D4724M-20.

[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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