



Designation: D3937 – 12 (Reapproved 2024)

Standard Test Method for Crimp Frequency of Manufactured Staple Fibers¹

This standard is issued under the fixed designation D3937; 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 the determination of the crimp frequency of manufactured staple fibers. This test method is applicable to all crimped staple fibers provided the crimp can be viewed two-dimensionally as a sine-wave configuration.

1.1.1 It should be recognized that yarn manufacturing processes or treatments to manufactured yarns can influence or modify crimp in fiber. Hence, the value for crimp of fibers taken from spun yarns may be different than that of the same fiber prior to the manufacturing or treatment processes.

1.2 Three options are provided for preparation of the specimens. Option One (preferred) uses single fibers for the specimens with a low magnification available, Option Two (optional for staple or tow samples) uses fiber chips as the specimens, and Option Three uses projected images of single fibers.

1.3 The values stated in SI units are to be regarded as the standard. The inch-pound units in parentheses are for information only.

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

D123 Terminology Relating to Textiles

D1776/D1776M Practice for Conditioning and Testing Textiles

D2258/D2258M Practice for Sampling Yarn for Testing

D3333 Practice for Sampling Manufactured Staple Fibers, Sliver, or Tow for Testing

D4849 Terminology Related to Yarns and Fibers

3. Terminology

3.1 For all terminology relating to D13.58, Yarns and Fibers, refer to Terminology **D4849**.

3.1.1 The following terms are relevant to this standard: crimp, crimp frequency, crimp index, fiber chip.

3.2 For all other terms are related to textiles, refer to Terminology **D123**.

4. Summary of Test Method

4.1 For Option One, a fiber specimen of manufactured staple is placed on a short pile or plush surface. The crimps along the entire length of the specimen is counted. After the specimen is counted, the fiber is straightened without deformation and its uncrimped length measured. Crimp frequency is reported as the number of crimps per unit of extended length.

4.2 For Option Two, the number of crimps is counted in fiber chip specimens. The specimen length is measured on fibers taken from each of the chips.

4.3 For Option Three, the fiber specimen is mounted between microscope slides. The image of the specimen is projected and its crimp is counted. The extended length of the specimen is measured as in Option One.

4.4 In each option, the crimp frequency is calculated from the numbers of crimp counted and the fiber lengths measured.

5. Significance and Use

5.1 This test method for the determination of crimp frequency of manufactured staple fibers may be used for the acceptance testing of commercial shipments but caution is advised since between-laboratory precision is known to be poor. Comparative tests conducted as directed in **5.1.1** may be advisable.

5.1.1 If there are differences or practical significance between reported test results for two laboratories (or more), comparative tests should be performed to determine if there is

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.

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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.