



Designation: D1577 – 07 (Reapproved 2018)

Standard Test Methods for Linear Density of Textile Fibers¹

This standard is issued under the fixed designation D1577; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 These test methods cover the measurement of mass per unit length (linear density) of textile fibers and filaments. Direct weighing and vibroscope procedures with modifications for crimped and uncrimped fibers are included. The options and sections are listed below.

Option	Sections
A—Fiber Bundle Weighing	7 – 15
B—Single-Fiber Weighing	16 – 23
C—Vibroscope, General	24 – 30
	35 and 36
C1—Uncrimped Fibers	31 and 32
C2—Crimped Fibers	33 and 34
Precision and Bias	37 and 38

NOTE 1—For linear density of short lengths of yarn, refer to Test Method [D1059](#). For cotton linear density, refer to Test Methods [D1769](#) and [D2480](#). For measurement of wool diameter, refer to Test Methods [D1282](#), [D2130](#), and [D3510](#).

1.2 The crimp, taper, and cross-sectional shape of the fiber may influence the linear density measured by single-fiber weighing and vibroscope.

1.3 These test methods measure the linear density of fibers with moisture in equilibrium with the standard atmosphere for testing textiles. The fiber moisture under these conditions is not necessarily the same as the commercial moisture regain for the fibers.

1.4 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 exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in nonconformance with the specification.

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 appropriate*

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

- [D123 Terminology Relating to Textiles](#)
- [D629 Test Methods for Quantitative Analysis of Textiles](#)
- [D1059 Test Method for Yarn Number Based on Short-Length Specimens](#)
- [D1282 Test Method for Resistance to Airflow as an Indicator of Average Fiber Diameter of Wool Top, Card Silver, and Scoured Wool \(Withdrawn 2018\)](#)³
- [D1769 Test Method for Linear Density of Cotton Fibers \(Array Sample\) \(Withdrawn 1988\)](#)³
- [D1776/D1776M Practice for Conditioning and Testing Textiles](#)
- [D1907/D1907M Test Method for Linear Density of Yarn \(Yarn Number\) by the Skein Method](#)
- [D2130 Test Method for Diameter of Wool and Other Animal Fibers by Microprojection](#)
- [D2257 Test Method for Extractable Matter in Textiles](#)
- [D2258/D2258M Practice for Sampling Yarn for Testing](#)
- [D2480 Test Method for Maturity Index and Linear Density of Cotton Fibers by the Causticaire Method \(Withdrawn 1992\)](#)³
- [D2904 Practice for Interlaboratory Testing of a Textile Test Method that Produces Normally Distributed Data \(Withdrawn 2008\)](#)³
- [D3333 Practice for Sampling Manufactured Staple Fibers, Sliver, or Tow for Testing](#)

¹ These test methods are under the jurisdiction of ASTM Committee [D13](#) on Textiles and are 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 service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ The last approved version of this historical standard is referenced on www.astm.org.