



Standard Test Method for LINEAR DENSITY OF COTTON FIBERS (ARRAY SAMPLE)¹

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¹ NOTE—Section 3.1 was changed editorially and Section 13 was added in April 1986.

1. Scope

1.1 This test method covers the determination of the linear density of a sample of loose cotton fibers, whether raw, processed, or obtained from cotton products.

1.2 The test method is designed to measure the mean linear density of the sample, but may also be used to determine the linear density of each length group within the sample.

1.3 It is assumed that the determination of linear density by this method will be preceded by the determination of fiber length and length distribution using Test Method D 1440, and that the arrays as prepared in Test Method D 1440 will be used for the determination of the linear density.

1.4 *This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety problems associated with its use. It is the responsibility of whoever uses this standard to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Applicable Documents

2.1 ASTM Standards:

D 123 Terminology Relating to Textiles²

D 1440 Test Method for Length and Length Distribution of Cotton Fibers (Array Method)³

D 1442 Test Method for Maturity of Cotton Fibers (Sodium Hydroxide Swelling and Polarized Light Procedures)³

D 1448 Test Method for Micronaire Reading of Cotton Fibers³

3. Definitions

3.1 *linear density, n* —mass per unit length; the quotient obtained by dividing the mass of a fiber or yarn by its length.

3.1.1 *Discussion*—The linear density of cotton fibers is customarily expressed as micrograms per inch, but millitex is also used.

3.2 For definitions of other textile terms used in this method refer to Terminology D 123.

4. Summary of Method

4.1 Fibers which have been sorted previously into groups of known length are weighed, then placed on a microscope slide, and counted. The mass per unit length is calculated from the number, mass, and length of the fibers in each specimen. The mass of each fiber group counted is assumed to be equal to its adjusted mass as determined by direct weighing.

5. Uses and Significance

5.1 Linear density is an important property of cotton fibers because of its effect on mill processing and yarn properties. The level of linear density limits the number of fibers per cross section for a prescribed yarn number, thereby affecting

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² Annual Book of ASTM Standards, Vols 07.01 and 07.02.

³ Annual Book of ASTM Standards, Vol 07.02.