



Standard Test Method for Diameter of Wool and Other Animal Fibers By Sirolan- Laserscan Fiber Diameter Analyser¹

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1. Scope

1.1 This test method covers a procedure, using the Sirolan-Laserscan, for the determination of the average fiber diameter and the fiber diameter variation in wool and other animal fibers in their various forms.

1.2 The values stated in SI units are to be regarded as the standard.

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

2. Referenced Documents

2.1 ASTM Standards:

D 123 Terminology Relating to Textiles²

D 584 Test Method for Wool Content of Raw Wool—Laboratory Scale²

D 1060 Practice for Core Sampling of Raw Wool in Packages for Determination of Percentage of Clean Wool Fiber Present²

D 1776 Practice for Conditioning Textiles for Testing²

D 2130 Test Method for Diameter of Wool and Other Animal Fibers by Microprojection²

D 2252 Specification for Fineness of Types of Alpaca²

D 2816 Test Method for Cashmere Coarse-Hair Content in Cashmere²

D 3991 Specifications for Fineness of Wool or Mohair and Assignment of Grade³

D 3992 Specifications for Fineness of Wool Top or Mohair Top and Assignment of Grade³

E 126 Test Method for Inspection and Verification of Hydrometers⁴

E 1750 Guide for Use of Water Triple Point Cells⁴

2.2 Federal Standards:

Official Standards of the United States for Grades of

Wool, Section 31.0⁵

Measurement Method for Determining Grade of Wool, Section 31.204⁵

Official Standards of the United States for Grades of Wool Top, Section 31.1⁶

Measurement Method for Determining Grade of Wool Top, Section 31.301⁶

IWTO-8 Method of Determining Wool Fiber Diameter by the Projection Microscope⁷

IWTO-12 Measurement of the Mean and Distribution of Fibre Diameter Using the Sirolan-Laserscan Fibre Diameter Analyser⁷

3. Terminology

3.1 Definitions:

3.1.1 *average fiber diameter, n*—the arithmetic width of a group of fibers.

3.1.1.1 *Discussion*—In wool and other animal fibers, all animal fibers, regardless of species, can be measured using the Sirolan-Laserscan to determine average fiber diameter.

3.1.2 *grade, n*—in wool and mohair, a numerical designation used in classification of fibers in their raw, semi-processed and processed forms based on average fiber diameter and variation of fiber diameter.

3.1.3 *snippet, n*—a wool or other animal fiber which has been cut to a specified length.

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

4. Summary of Test Method

4.1 This test method describes procedures for sampling various forms of wool, the reduction of the sample to small test specimens, and measurement of the diameter of a number of fibers from the test specimens using the Laserscan. Snippets cut from the various forms of wool are cleaned where required, and dispersed in a mixture of isopropanol and water. The suspension of snippets is transported through a measuring cell which is positioned in a beam of laser light. The reduction in intensity of the laser beam as the individual snippets pass through the beam of light, approximately 500 μm in diameter,

¹ This test method is under the jurisdiction of ASTM Committee D-13 on Textiles and is the direct responsibility of Subcommittee D13.13 on Wool and Wool Felt.

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² *Annual Book of ASTM Standards*, Vol 07.01.

³ *Annual Book of ASTM Standards*, Vol 07.02.

⁴ *Annual Book of ASTM Standards*, Vol 14.03.

⁵ *Federal Register*, Vol 30, No. 161, Aug. 20, 1965, pp. 10829–10833.

⁶ *Federal Register*, Vol 33, No. 248, Dec. 21, 1968, pp. 19073–19076.

⁷ International Wool Textile Organization, International Wool Secretariat, Commercial Development Department, Valley Drive, Ilkley, LS298PB, England.