



Designation: D 3991 – 94 (Reapproved 2000)

## Standard Specifications for Fineness of Wool or Mohair and Assignment of Grade<sup>1</sup>

This standard is issued under the fixed designation D 3991; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 These specifications cover the classification, by fineness grade, of wool or mohair that is in the grease, pulled, washed, or scoured state, or in the form of card sliver.

1.2 These specifications are applicable also to assignment of grade for wool or mohair in spun materials or products processed beyond carding on the woolen system but not on the worsted system which involves a combing process.

NOTE 1—For fineness specifications for wool top, mohair top, and alpaca, refer to Specifications D 3992 and D 2252.

### 2. Referenced Documents

#### 2.1 ASTM Standards:<sup>2</sup>

- D 123 Terminology Relating to Textiles
- D 2130 Test Method for Diameter of Wool and Other Animal Fibers by Microprojection
- D 2252 Specification for Fineness of Types of Alpaca
- D 3992 Specification for Fineness of Wool Top or Mohair Top and Assignments of Grade

#### 2.2 Federal Standards:

- Official Standards of the United States for Grades of Wool, Section 31.0<sup>3</sup>
- Measurement Method for Determining Grade of Wool, Section 31.204<sup>3</sup>
- Official Standards of the United States for Grades of Grease Mohair, Section 32.1<sup>4</sup>
- Measurement Method for Determining Grade of Grease Mohair, Section 32.204<sup>4</sup>

NOTE 2—A discussion on the development of grease mohair standards

<sup>1</sup> These specifications are under the jurisdiction of ASTM Committee D-13 on Textiles and are the direct responsibility of Subcommittee D13.13 on Wool and Wool Felt.

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<sup>2</sup> 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.

<sup>3</sup> *Federal Register*, Vol 30, No. 161, Aug. 20, 1965, pp 10829-10833.

<sup>4</sup> *Federal Register*, Vol 36, No. 129, July 3, 1971, pp 12681-12685.

can be found in the literature.<sup>5,6</sup>

### 3. Terminology

#### 3.1 Definitions:

3.1.1 *average fiber, diameter, n*—in wool and other animal fibers, the average width of a group of fibers when measured on a projected image.

3.1.2 *fineness, n*—of textile fibers, a relative measure of size, diameter, linear density or mass per unit length expressed in a variety of units.

3.1.2.1 *Discussion*—The fineness of wool and other animal fibers is expressed as the average fiber width or average fiber diameter in micrometres ( $\mu\text{m}$ ).

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

3.1.3.1 *Discussion*—This specification expresses the variation in fiber diameter by means of the standard deviation of the fiber diameter measurements.

3.1.3.2 The term “grade” should not be confused with the terms “quality” and “type.” “Quality” is a term that includes not only fineness but also characteristics such as length, crimp, strength, elasticity, luster, tactile hand, and color, all of which affect the spinnability of the fiber and the properties of the resulting yarn and fabric. The Bradford designations, for which no standards exist, use a scale similar to that for grade designations (for example: 64s, 56s, and so forth) and refer to quality and not solely to fineness. “Type” is a term designating a particular combination of characteristics applicable to a specific use or descriptive of geographical origin, breed of sheep, or preparation for market.

3.1.4 *mohair, n*—the hair of the Angora goat, *Capra* species.

3.1.5 *wool, n*—the fibrous covering of the sheep, *Ovis* species.

3.1.6 For definitions of other textile terms used in this specification, refer to Terminology D 123.

<sup>5</sup> Keller, H. R., Ray, H. D., Lineberry, C. T., and Pohle, E. M., “Fineness Relationship of Grease Mohair, Card Sliver, and Top,” *Textile Research Journal*, Vol 42, No. 2, February 1971.

<sup>6</sup> ASTM Research Report No. D13-1012. A copy is available from ASTM Headquarters, 100 Barr Harbor Drive, West Conshohocken, PA 19428.