



Standard Test Method for Counting Partial Cleavages in Wool and Other Animal Fibers¹

This standard is issued under the fixed designation D 4510; 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 a procedure, using the micro-projector, for the counting of partial cleavages in wool and other animal fibers.

1.2 *This standard does not purport to address all of the safety problems, 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 2130 Test Method for Diameter of Wool and Other Animal Fibers by Microprojection²

D 2258 Practice for Sampling Yarn for Testing²

D 2525 Practice for Sampling Wool for Moisture²

2.2 Other Document:

Wool Products Labeling Act of 1983³

3. Terminology

3.1 Definitions:

3.1.1 *animal fiber, n*—any natural protein-base fiber.

3.1.2 *cortex, n*—in mammalian hair fibers, the principal body of the fiber made up of elongated cells.

3.1.3 *cuticle, n*—in mammalian hair fibers, the layers of flattened cells enclosing the cortex, which forms an envelope of overlapping scales surrounding the fiber.

3.1.4 *partial cleavage, n*—in textiles, a transverse gouge, cut or other cross-wise rent in the fiber. Clearly penetrating at least the cuticle of the fiber.

3.1.5 *wool, n*—as defined in the Wool Products Labeling Act of 1939, the fiber from the fleece of the sheep or lamb, or hair of the Angora goat or Cashmere goat (and may include the

so called specialty fibers from the hair of the camel, alpaca, llama, and vicuna) which has never been reclaimed from any woven or felted wool product.

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

4. Summary of Test Method

4.1 This test method describes a procedure:

4.1.1 The segmenting of various test specimens in preparation for testing,

4.1.2 The projection on a screen of magnified images of the randomly sampled short segments of fiber from the small test specimens, and

4.1.3 The measurement of the number of partially cleaved fibers.

5. Significance and Use

5.1 Test Method D 4510 for the counting of partial cleavages, may be used for the acceptance testing of commercial shipments of wool and other animal fibers, but caution is advised, since information on between-laboratory precision is limited. Comparative tests as directed in 5.1.1 may be advisable.

5.1.1 In case of a dispute arising from differences in reported test results when using this test method for acceptance testing of commercial shipments, the purchaser and the supplier should conduct comparative tests to determine if there is a statistical bias between their laboratories. Competent statistical assistance is recommended for the investigation of bias. As a minimum, the two parties should take a group of test specimens that are as homogeneous as possible and that are from a lot of material of the type in question. The test specimens should then be randomly assigned in equal numbers to each laboratory for testing. The average results from the two laboratories should be compared using Student's t-test for unpaired data and an acceptable probability level chosen by the two parties before the testing is begun. If a bias is found, either its cause must be found and corrected or the purchaser and the supplier must agree to interpret future test results in the light of the known bias.

5.2 Chemically damaged or tendered fibers are recognizable microscopically by qualified operators and should not be counted as partial cleavages. Such fibers exhibit total loss of cuticle, severe surface erosion, tenderizing cracks, longitudinal

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.

Current edition approved May 15, 1993. Published July 1993. Originally published as D 4510 – 91. Last previous edition D 4510 – 91.

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

³ Act of Congress, "Wool Products Labeling Act of 1939," 76th Congress, Third Session, approved October 14, 1939.