



Designation: D4845 – 10 (Reapproved 2018)

Standard Terminology Relating to Wool¹

This standard is issued under the fixed designation D4845; 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. Referenced Documents

1.1 *ASTM Standards*:²

- D123 Terminology Relating to Textiles
- D461 Test Methods for Felt (Withdrawn 2003)³
- D519 Test Method for Length of Fiber in Wool Top
- D584 Test Method for Wool Content of Raw Wool—Laboratory Scale
- D1060 Practice for Core Sampling of Raw Wool in Packages for Determination of Percentage of Clean Wool Fiber Present
- D1113 Test Method for Vegetable Matter and Other Alkali-Insoluble Impurities in Scoured Wool
- D1234 Test Method of Sampling and Testing Staple Length of Grease Wool
- D1282 Test Method for Resistance to Airflow as an Indication of Average Fiber Diameter of Wool Top, Card Silver, and Scoured Wool (Withdrawn 2018)³
- D1283 Test Method for Alkali-Solubility of Wools
- D1294 Test Method for Tensile Strength and Breaking Tenacity of Wool Fiber Bundles 1-in. (25.4-mm) Gage Length
- D1334 Test Method for Wool Content of Raw Wool—Commercial Scale (Withdrawn 2018)³
- D1574 Test Method for Extractable Matter in Wool and Other Animal Fibers
- D1575 Test Method for Fiber Length of Wool in Scoured Wool and in Card Sliver
- D1576 Test Method for Moisture in Wool by Oven-Drying
- D1770 Test Method for Neps, Vegetable Matter, and Colored Fiber in Wool Top
- D2118 Practice for Assigning a Standard Commercial Moisture Content for Wool and its Products (Withdrawn 2018)³
- D2130 Test Method for Diameter of Wool and Other Animal

- Fibers by Microprojection
- D2165 Test Method for pH of Aqueous Extracts of Wool and Similar Animal Fibers
- D2252 Specification for Fineness of Types of Alpaca (Withdrawn 2018)³
- D2462 Test Method for Moisture in Wool by Distillation With Toluene
- D2475 Specification for Felt
- D2524 Test Method for Breaking Tenacity of Wool Fibers, Flat Bundle Method— $\frac{1}{8}$ -in. (3.2-mm) Gage Length
- D2525 Practice for Sampling Wool for Moisture
- D2720 Practice for Calculation of Commercial Weight and Yield of Scoured Wool, Top, and Noil for Various Commercial Compositions
- D2816 Test Method for Cashmere Coarse-Hair Content in Cashmere (Withdrawn 2018)³
- D2817 Specification for Maximum Cashmere Coarse-Hair Content in Cashmere (Withdrawn 2018)³
- D2968 Test Method for Med and Kemp Fibers in Wool and Other Animal Fibers by Microprojection
- D3991 Specifications for Fineness of Wool or Mohair and Assignment of Grade
- D3992 Specifications for Fineness of Wool Top or Mohair Top and Assignment of Grade
- D4510 Test Method for Counting Partial Cleavages in Wool and Other Animal Fibers (Withdrawn 2018)³
- D4845 Terminology Relating to Wool
- D6466 Test Method for Diameter of Wool and Other Animal Fibers By Sirolan-Laserscan Fiber Diameter Analyser
- D6500 Test Method for Diameter of Wool and Other Animal Fibers Using an Optical Fiber Diameter Analyser

2. Terminology

acid content, *n*—*of felt*, the number of milliequivalents of acid present per unit weight of felt, measured under prescribed conditions. **D461**

alkali-solubility, *n*—*in wool*, the percent of clean wool that is soluble in a specified alkaline solution under controlled conditions of temperature and time. **D1283**

alpaca, *n*—the fleece and fiber produced by the alpaca, an animal of the genus *Llama* (*Lama glama pacus*). The fiber is obtained from several species, namely, Huacaya and Suri. **D2252**

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

Current edition approved July 1, 2018. Published August 2018. Originally approved in 1988. Last previous edition approved in 2010 as D4845 – 10^{ε2}. DOI: 10.1520/D4845-10R18.

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.

DISCUSSION—Alpaca is normally classified according to type, representing particular combinations of characteristics appropriate to a specific use, or descriptive of geographic origin, breed or species of animal, or preparation for market.

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

D1574, D4510

aqueous extract, *n*—*in wool testing*, the solution obtained by digesting a material with water or with a sodium chloride solution to dissolve soluble materials.

D2165

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

D2130, D2252, D3991, D3992

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

D6500

DISCUSSION—In wool and other animal fibers, all animal fibers, regardless of species, can be measured using the OFDA to determine average fiber diameter.

D6500

black felt, *n*—those classifications of felt manufactured to various shades of the color black.

D2475

breaking tenacity, *n*—the tenacity corresponding to the breaking load.

D1294, D2524

DISCUSSION—Breaking tenacity is commonly expressed as grams-force per tex (gf/tex), grams-force per denier (gf/den), millinewtons per tex (mN/tex), or millinewtons per denier (mN/den). Millinewtons are numerically equal to grams-force times 9.81.

burr-wool waste, *n*—waste removed by the burr guard of cards or burr pickers having a very short fiber and full of burrs or seeds.

D4845

DISCUSSION—The nature of the waste varies according to the wool from which the burrs are taken.

carbonized and neutralized wool, *n*—a term descriptive of scoured wool processed to destroy cellulosic impurities by treating with a mineral acid or an acid salt, drying and baking, crushing, and dusting out the embrittled cellulosic matter followed by neutralization of the acidified wool.

D2118

carded wool, *n*—scoured wool which has been processed through a carding machine.

D1575

cashmere, *n*—*in roving, yarn, or fabrics*, cashmere hair or products made therewith having a cashmere coarse-hair content not exceeding a specified maximum percentage by length.

D2816, D2817

cashmere coarse-hair, *n*—those coarse fibers in cashmere hair having widths greater than 30 μm .

D2816, D2817

cashmere coarse-hair content, *n*—the total length of the cashmere coarse-hair fibers that are present, expressed as a percentage of the total length of all the cashmere hair fibers; that is, the percentage by length of cashmere coarse-hair in cashmere hair.

D2816, D2817

cashmere down, *n*—those fibers in cashmere hair having widths of 30 μm or less.

D2816, D2817

cashmere hair, *n*—the fibers produced by a form of goat (*Capra hircus*) indigenous to Asia and known as the cashmere goat.

D2816, D2817

DISCUSSION—Characteristically, cashmere hair consists of fine down (undercoat) fibers and coarse (outercoat) fibers.

clean wool fiber present, *n*—*in raw wool*, the mass of wool base present in the raw wool, adjusted to a moisture content of 12 %, an alcohol-extractable content of 1.5 %, and a mineral matter content of 0.5 %.

D584, D1060, D1334

colored fiber, *n*—*in wool top*, any fiber the color or shade of which differs from the normal color or shade of the fiber mass of the sample.

D1770

combing wool, *n*—wool that is strong and strictly of combing length, that is, 2 in. (50 mm) or more.

D4845

commercial composition, *n*—*in wool*, the percentages by weight of wool base, moisture, and other nonwool-base components in wool to which a specific commercial designation is applied. (Compare *commercial weight*.)

D2720

commercial designation, *n*—*in wool*, a term applied to a lot of wool in a stated form, and having a specified commercial composition.

D2720

commercial moisture content, *n*—the moisture calculated as a percentage of the weight of the wool, top, noils, yarn, fabric, etc., in the “as-is” condition; that is, containing whatever moisture, oil, grease, or other extraneous matter that may be present.

D2118

DISCUSSION—The term “moisture regain” as defined in Terminology D123, leads to certain difficulties in defining the clean wool basis for calculation, which do not occur when the term “moisture content” is used. Moisture content can be applied directly to the product in the as-is condition while moisture regain cannot.

commercial weight, *n*—billed weight as determined by a generally accepted method or as agreed to by the purchaser and the seller.

D2720

DISCUSSION—For shipments of commercially designated scoured wool, wool top, or wool noil, the generally accepted commercial weight is the weight of wool base contained in the shipment as determined by definite prescribed methods, plus the weights of moisture and other components corresponding to the commercial composition of the commercially designated material.

D2720

constant-rate-of-extension (CRE) type tensile testing machine, *n*—*in tensile testing*, an apparatus in which the pulling clamp moves at a uniform rate, and the force-measuring mechanism moves a negligible distance with increasing force, less than 0.13 mm (0.005 in.).

D1294, D2524

constant-rate-of-loading (CRL) type tensile testing machine, *n*—*in tensile testing*, an apparatus in which the rate of increase of the force is uniform with time after the first 3 s and the specimen is free to elongate, this elongation being dependent on the extension characteristics of the specimen at any applied force.

D1294, D2524

constant-rate-of-traverse (CRT) type tensile testing machine, *n*—*in tensile testing*, an apparatus in which the pulling clamp moves at a uniform rate and the force is

applied through the other clamp, which moves appreciably to actuate a force-measuring mechanism, producing a rate of increase of force or extension that is usually not constant and is dependent on the extension characteristics of the specimen. **D1294, D2524**

core, *n*—in *sampling fiber packages*, the portion of wool or other fiber obtained by using a sampling tube. **D1060**

cortex, *n*—in *mammalian hair fibers*, the principal body of the fiber made up of elongated cells. **D4510**

cuticle, *n*—in *mammalian hair fibers*, the layers of flattened cells enclosing the cortex, which forms an envelope of overlapping scales surrounding the fiber. **D4510**

diameter, average fiber—See **average fiber diameter**.

dimensional change in boiling water (felt), *n*—the change in length and width with any associated change in thickness produced by immersion in boiling water under specified conditions. **D461**

epidermis, *n*—in *mammalian hair fibers*, the outside or surface layer of the fiber consisting of flat, irregular, horny cells or scales. **D4845**

extractable matter, *n*—nonfibrous material in or on a textile, not including water, which is removable by a specified solvent or solvents as directed in a specified procedure. **D461, D1574**

DISCUSSION—Extractable matter does not include moisture but (1) is non-fibrous material, (2) is usually oily, waxy, or resinous in nature, and (3) may include protein, particularly if the extracting solvent is ethyl alcohol or contains ethyl alcohol.

felt, *n*—a textile structure characterized by interlocking and consolidation of its constituent fibers achieved by the interaction of a suitable combination of mechanical energy, chemical action, moisture, and heat but without the use of weaving, knitting, stitching, thermal bonding, or adhesives. **D2475**

DISCUSSION—In practice, light needling may be used to supplement the ability of the fibers to interlock and consolidate.

fineness, *n*—of *textile fibers*, a relative measure of size, diameter, linear density or mass per unit length expressed in a variety of units. **D2252, D3991, D3992**

DISCUSSION—The fineness of alpaca, wool, and other animal fibers is expressed as the average fiber width or average fiber diameter in micrometers (μm).

flame resistance, *n*—the property of a material whereby flaming combustion is prevented, terminated, or inhibited following application of a flaming or nonflaming source of ignition, with or without subsequent removal of the ignition source. **D461**

gage length, *n*—in *tensile testing*, the length of a specimen measured between the points of attachment to clamps while under uniform tension. **D1294, D2524**

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. **D2130, D3991, D3992**

DISCUSSION—This specification expresses the variation in fiber diameter by means of the standard deviation of the fiber diameter measurements. **D3991, D3992**

DISCUSSION—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, etc.) 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. **D3991, D3992**

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. **D6500**

gray felt, *n*—a blend of white fibers with naturally colored or dyed fibers or both and that has an overall gray appearance. **D2475**

grease wool, *n*—wool taken from the living sheep and which has not been commercially scoured. **D1234, D1574, D1576, D2462**

hair, *n*—natural animal fiber other than sheep’s wool or silk. **D4845**

DISCUSSION—It is recognized that this definition implies a distinction between sheep’s wool and the covering of other animals, notwithstanding similarity in their fiber characteristics. Thus the crimped form and the scaly structure are not confined to sheep’s wool. It seems desirable in the textile trade, however, to avoid ambiguity by confining the term wool to the covering of sheep and to have available a general term for other fibers of animal origin. Normally the less widely used fibers are known by name, for example, alpaca, mohair, etc., but collectively they are classed as hairs.

kemp fiber, *n*—a medullated animal fiber in which the diameter of the medulla is 60 % or more, of the diameter of the fiber. **D2968**

laboratory sample, *n*—a portion of material taken to represent the lot sample, or the original material, and used in the laboratory as a source of test specimens. **D1770, D2525**

laboratory sample, *n*—in *wool top*, the portions drawn from the lot in accordance with the described procedure. **D1770**

lot, *n*—in *acceptance sampling*, that part of a consignment or shipment consisting of a material from one production lot. **D1770, D2525**

lot, *n*—in *wool, top*, the entire quantity, not exceeding 20 000 lb (9100 kg) of a single combing, that comprises a single unit for which a test for neps, vegetable matter or colored fiber, or all three combined is desired. **D1770**

med fiber, *n*—a medullated animal fiber in which the diameter of the medulla is less than 60 % of the diameter of the fiber. **D2968**

medulla, *n*—in *mammalian hair fibers*, the more or less continuous cellular marrow inside the cortical layer in most medium and coarse fibers. **D2968**