



Designation: D 4845 – 05

Standard Terminology Relating to Wool¹

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1. Scope

1.1 This terminology covers definitions of technical terms used in the wool industry. Terms that are generally understood or adequately defined in other readily available sources are not defined.

1.2 Other terminology standards of interest are shown in 2.1

2. Referenced Documents

2.1 *ASTM Standards*:²

D 123 Terminology Relating to Textiles

3. Terminology

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

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.

There are two varieties of the alpaca animal, the Huacaya and Suri. The Suri produces straighter, finer, and longer fibers, but most alpaca production is of the Huacaya variety. 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 (see Appendix X1).

D 2252

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

D 461

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.

D 1283

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.

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.

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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.

D 2252

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.

DISCUSSION—(D1474) As used in this standard, “animal fiber” refers in particular to those fibers covered by the Wool Products Labeling Act of 1939 and “recycled wool” as defined in the Act as amended in 1980. It also includes, but is not limited to, those fibers listed in Table 1 of Terminology D 123

D 1574, D 4510

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.

D 2165

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

D 2130, D 2252, D 3991, D 3992

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

D 2475

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.

D 4845

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.

D 2118

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

D 1575

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.

D 2816, D 2817

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

DISCUSSION—For the purpose of the source test methods, width shall be determined as directed in Test Method D 2130.

D 2816,

D 2817

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. **D 2816, D 2817**

cashmere down, *n*—those fibers in cashmere hair having widths of 30 μm or less. **D 2816, D 2817**

cashmere hair, *n*—the fibers produced by a form of goat (*Capra hircus*) indigenous to Asia and known as the cashmere goat. **D 2816, D 2817**

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 %.

DISCUSSION—(D1334) The term “clean wool fiber present” is synonymous with the term “absolute clean content” as defined in the Tariff Schedules of the United States of America (see Test Method D 584).

D 584, D 1060, D 1334

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. **D 1770**

combing wool, *n*—wool that is strong and strictly of combing length, that is, 2 in. (50 mm) or more. **D 4845**

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. **D 2720**

commercial designation, *n*—*in wool*, a term applied to a lot of wool in a stated form, and having a specified commercial composition. **D 2720**

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. **D 2118**

DISCUSSION—The term “moisture regain” as defined in Terminology D 123,² 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.

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.). **D 1294, D 2524**

constant-rate-of-loading (CRL) type tensile testing machine, *n*—*in testing tensile*, 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. **D 1294, D 2524**

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. **D 1294, D 2524**

core, *n*—*in sampling fiber packages*, the portion of wool or other fiber obtained by using a sampling tube. **D 1060**

cortex, *n*—*in mammalian hair fibers*, the principal body of the fiber made up of elongated cells. **D 4510**

cuticle, *n*—*in mammalian hair fibers*, the layers of flattened cells enclosing the cortex, which forms an envelope of overlapping scales surrounding the fiber. **D 4510**

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. **D 461**

epidermis, *n*—*in mammalian hair fibers*, the outside or surface layer of the fiber consisting of flat, irregular, horny cells or scales. **D 4845**

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. **D 461, D 1574**

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. **D 2475**

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. **D 2252, D 3991, D 3992**

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. **D 461**

gage length, *n*—*in tensile testing*, the length of a specimen measured between the points of attachment to clamps while under uniform tension. **D 1294, D 2524**

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. **D 2130, D 3991, D 3992**

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.

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

D 2475

grease wool, n—wool taken from the living sheep and which has not been commercially scoured.

D 1234, D 1574, D 1576, D 2462

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

D 4845

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.

D 2968

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.

D 2525

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

D 1770

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

D 2525

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.

D 1770

lot sample, n—one or more shipping units taken at random to represent an acceptance sampling lot and used as a source of laboratory samples.

D 2525

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

D 2968

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

D 2968

medullated fiber, n—an animal fiber that in its original state includes a medulla.

D 2968

merino, adj—from pure-bred merino sheep.

D 4845

DISCUSSION—Merino wool usually has a fiber diameter of 24 μm or less.

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

D 3991, D 3992

moisture content, n—the amount of moisture in a material determined under prescribed conditions and expressed as a percentage of the mass of the moist material, that is, the original mass comprising the dried substance plus any moisture present.

D 1576, D 2462

DISCUSSION—The term “mass” is the correct designation for the property commonly designated as “weight.” A slight amount of residual moisture may not be removed from a specimen subjected to oven drying because of the relative humidity of the ambient air. The amount of moisture retained by a specimen may be estimated from published data.³ There may also be a slight additional loss in mass caused by the evaporation of volatile material other than water, the amount depending on the characteristics of any added oils or emulsions.

moisture-free, adj—the condition of a material that has been exposed in an atmosphere of desiccated air until there is no further significant change in its mass.

D 1576, D 2462

DISCUSSION—Heating the material and the desiccated air to temperatures as high as 110°C increases the rate of moisture loss but does not change the final equilibrium mass of the moisture-free material.

moisture regain, n—the amount of moisture in a material determined under prescribed conditions and expressed as a percentage of the mass of the moisture-free material.

D 1576, D 2462

natural fiber, n—a class name for various genera of fibers (including filaments) of (1) animal, (2) mineral, or (3) vegetable origin.

D 4845

DISCUSSION—Examples—(1) Silk and wool, (2) asbestos, (3) cotton, flax, jute, ramie.

needled felt, n—a textile structure composed entirely of fibers physically interlocked and reoriented through the action of felting needles.

D 2475

nep, n—one or more fibers occurring in a tangled and unorganized mass.

D 1770

noil, n—the short fibers removed in combing; applied particularly to wool, but also to other fibers such as cotton, silk, and rayon.

D 4845

other alkali-insoluble impurities, n—*in scoured wool*, oven-dried, ash-free, alcohol-extractives-free, alkali-insoluble substances other than vegetable matter base, such as skin, cotton or other fibers, paper, string, tag (dung) pieces, paint pieces, etc.

D 584, D 1113, D 1334

oven-dried, adj—the condition of a material that has been heated under prescribed conditions of temperature and humidity until there is no further significant change in its mass.

D 584, D 1113, D 1334, D 1576, D 2462, D 2720

DISCUSSION—An oven-dry material will retain a small amount of moisture which is dependent on the temperature and relative humidity of the atmosphere in contact with the material during the drying

³ Toner, R. K., Bowen, C. F., and Whitwell, J. C., “Equilibrium Moisture Relations for Textile Fibers,” *Textile Research Journal*, Vol 17, January 1947, pp. 7–18.