



Designation: D 4850 – 03a (Reapproved 2007)

Standard Terminology Relating to Fabric¹

This standard is issued under the fixed designation D 4850; 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 approval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This terminology covers definitions of technical terms used in the industry related to textile fabrics. Terms that are generally understood or adequately defined in other readily available sources are not included. Other terminology standards that have terms related to textile fabrics are shown in 2.1

2. Referenced Documents

2.1 ASTM Standards:

- D 737 Test Method for Air Permeability of Textile Fabrics
- D 1117 Guide for Evaluating Nonwoven Fabrics
- D 1336 Test Method for Distortion of Yarn in Woven Fabrics
- D 1388 Test Method for Stiffness of Fabrics
- D 1424 Test Method for Tearing Strength of Fabrics by Falling-Pendulum Type (Elmendorf) Apparatus
- D 1775 Test Method for Tension and Elongation of Wide Elastic Fabrics²
- D 1777 Test Method for Thickness of Textile Materials
- D 2261 Test Method for Tearing Strength of Fabrics by the Tongue (Single Rip) Procedure (Constant-Rate-of-Extension Tensile Testing Machine)
- D 2594 Test Method for Stretch Properties of Knitted Fabrics Having Low Power
- D 2646 Test Methods for Backing Fabric Characteristics of Pile Yarn Floor Coverings
- D 3107 Test Methods for Stretch Properties of Fabrics Woven from Stretch Yarns
- D 3511 Test Method for Pilling Resistance and Other Related Surface Changes of Textile Fabrics: Brush Pilling Tester
- D 3512 Test Method for Pilling Resistance and Other Related Surface Changes of Textile Fabrics: Random Tumble Pilling Tester
- D 3514 Test Method for Pilling Resistance and Other Related Surface Changes of Textile Fabrics: Elastomeric Pad
- D 3773 Test Methods for Length of Woven Fabric
- D 3774 Test Method for Width of Textile Fabric

- D 3775 Test Method for Warp End Count and Filling Pick Count of Woven Fabric
- D 3786 Test Method for Bursting Strength of Textile Fabrics—Diaphragm Bursting Strength Tester Method
- D 3787 Test Method for Bursting Strength of Textiles—Constant-Rate-of-Traverse (CRT) Ball Burst Test
- D 3789 Practice for Labeling Cans of Consumer Spray Paint²
- D 3882 Test Method for Bow and Skew in Woven and Knitted Fabrics
- D 3883 Test Methods for Yarn Crimp and Yarn Take-up in Woven Fabrics
- D 3884 Guide for Abrasion Resistance of Textile Fabrics (Rotary Platform, Double-Head Method)
- D 3885 Test Method for Abrasion Resistance of Textile Fabrics (Flexing and Abrasion Method)
- D 3886 Test Method for Abrasion Resistance of Textile Fabrics (Inflated Diaphragm Apparatus)
- D 3887 Specification for Tolerances for Knitted Fabrics
- D 3939 Test Method for Snagging Resistance of Fabrics (Mace)
- D 3990 Terminology Relating to Fabric Defects
- D 4032 Test Method for Stiffness of Fabric by the Circular Bend Procedure
- D 4033 Test Method for Resistance to Yarn Slippage at the Sewn Seam in Upholstery Fabrics (Dynamic Fatigue Method) (Discontinued 2001)²
- D 4034 Test Method for Resistance to Yarn Slippage at the Sewn Seam in Woven Upholstery Fabrics (Discontinued 2001)²
- D 4157 Test Method for Abrasion Resistance of Textile Fabrics (Oscillatory Cylinder Method)
- D 4158 Guide for Abrasion Resistance of Textile Fabrics (Uniform Abrasion)
- D 4390 Practice for the Evaluation of the Performance of Terry Bathroom Products for Home Use²
- D 4772 Test Method for Surface Water Absorption of Terry Fabrics (Water Flow)
- D 4350 Test Method for Corrosivity Index of Plastics and Fillers
- D 4685 Test Method for Pile Fabric Abrasion
- D 4848 Terminology of Force, Deformation and Related Properties of Textiles

¹ This terminology is under the jurisdiction of ASTM Committee D13 on Textiles and is the direct responsibility of Subcommittee D13.59 on Fabric Test Methods, General.

Current edition approved July 1, 2007. Published August 2007. Originally approved in 1989. Last previous edition approved in 2003 as D 4850 – 03a.

² Withdrawn.



- D 4850 Terminology Relating to Fabric
- D 4851 Test Methods for Coated and Laminated Fabrics for Architectural Use
- D 4964 Test Method for Tension and Elongation of Elastic Fabrics (Constant-Rate-of-Extension Type Tensile Testing Machine)
- D 4966 Test Method for Abrasion Resistance of Textile Fabrics (Martindale Abrasion Tester Method)
- D 4970 Test Method for Pilling Resistance and Other Related Surface Changes of Textile Fabrics: Martindale Tester
- D 5034 Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test)
- D 5035 Test Method for Breaking Force and Elongation of Textile Fabrics (Strip Method)
- D 5103 Test Method for Length and Length Distribution of Manufactured Staple Fibers (Single-Fiber Test)
- D 5278 Test Method for Elongation of Narrow Elastic Fabrics (Static-Load Testing)
- D 5362 Test Method for Snagging Resistance of Fabrics (Bean Bag)
- D 5378 Performance Specification for Woven and Knitted Shower Curtains for Institutional and Household Use
- D 5426 Practices for Visual Inspection and Grading of Fabrics Used for Inflatable Restraints
- D 5430 Test Methods for Visually Inspecting and Grading Fabrics
- D 5446 Practice for Determining Physical Properties of Fabrics, Yarns, and Sewing Thread Used in Inflatable Restraints
- D 5587 Test Method for Tearing Strength of Fabrics by Trapezoid Procedure
- D 5684 Terminology Relating to Pile Floor Coverings
- D 5793 Test Method for Binding Sites per Unit Length or Width of Pile Yarn Floor Coverings
- D 6207 Test Method for Dimensional Stability of Fabrics to Changes in Humidity and Temperature

3. Terminology

3.1 Definitions:

- abrasion**, *n*—the wearing away of any part of a material by rubbing against another surface. **D 3884, D 3885, D 3886, D 4157, D 4158, D 4685, D 4966**
- abrasion cycle**, *n*—one complete movement across the surface of a material.

DISCUSSION—The complete movement for an abrasion cycle is dependent on the action of the abrasion machine and the test method used. It may consist of one back-and-forth unidirectional movement or one circular movement, or a combination of both. **D 3885**

- air permeability**, *n*—the rate of air flow passing perpendicular through a known area under a prescribed air pressure differential between the two surfaces of a material.

DISCUSSION—Air permeability of fabric at a stated pressure differential between two surfaces of the fabric is generally expressed in SI units as $\text{cm}^3/\text{s}/\text{cm}^2$ and in inch-pound units as $\text{ft}^3/\text{min}/\text{ft}^2$ calculated in operating conditions. (See **permeability, porosity**.) **D 737**

- air-supported roof**, *n*—a fabric roof-system that is properly

secured and primarily supported and held in place by air pressure. **D 4851**

- architectural-use**, *n*—*in the building trade*, a descriptive term for fabrics used in fabric roof-systems or similar industrial applications. (See also **fabric roof-system**.) **D 4851**

- bagging**, *n*—any material, such as fabric or other suitable material used to protect commodities during shipment and/or storage.

DISCUSSION—Fabrics may be of the woven, knitted, or non-woven type, and are typically produced with cotton, jute, polyethylene, or polypropylene fibers. **D 4850**

- bending length**, *n*—(1) *general*—a measure of the interaction between fabric weight and fabric stiffness as shown by the way in which a fabric bends under its own weight. It reflects the stiffness of a fabric when bent in one plane under the force of gravity, and is one component of drape; (2) *specific*—the cube root of the ratio of the flexural rigidity to the weight per unit area. **D 1388**

- book fold**, *n*—a fabric doubled selvage to selvage, then folded back and forth upon itself in predetermined lengths. (See also **shoe fold**.)

DISCUSSION—When the piece is completed, the fold-edges on each side are folded once more upon themselves so that the fold-edges are inside, forming a compact package as long as one half the width of the fabric. **D 4850**

- bow**, *n*—a fabric condition resulting when filling yarns or knitted courses are displaced from a line perpendicular to the selvages and form one or more arcs across the width of the fabric. (See also **double bow**.) **D 3882, D 3990**

- braided fabric**, *n*—a structure produced by interlacing three or more ends of yarns in a manner such that the paths of the yarns are diagonal to the vertical axis of the fabric. **D 4850**

- broken end**, *n*—*in woven fabrics*, a void in the warp direction due to yarn breakage. **D 3990**

- burlap**, *n*—a coarse, heavy, plain weave fabric of yarns, such as bast or cotton fiber yarn. **D 4850**

- bursting strength**, *n*—the force or pressure required to rupture a fabric by distending it with a force, applied at right angles to the plane of the fabric, under specified conditions. **D 3786, D 3787, D 3887**

- circular bend**, *n*—simultaneous, multidirectional deformation of a fabric in which one face of a flat specimen becomes concave and the other becomes convex. **D 4032**

- coated fabric**, *n*—a flexible material composed of a fabric and any adherent polymeric material applied to one or both surfaces. (See also **laminated fabric**.) **D 4850, D 4851, D 5446**

- color contrast**, *n*—*in textiles*, a general term for a visible color difference between two adjacent areas.

DISCUSSION—For the purpose of Test Methods **D 3939** and **D 5362**, a color contrast is a visible color difference between a snag and the immediate surrounding area of the fabric that has no defects. Color contrasts often occur when printed fabrics are snagged. **D 3939, D 5362**



corduroy, *n*—a filling cut-pile fabric in which the cut fibers form a surface of wales (rounded cords or ribs) which usually run warpwise. **D 4685, D 4850**

count, *n*—*in woven fabric*, the number of warp yarns (ends) and filling yarns (picks) per unit distance as counted while the fabric is held under zero tension, and is free of folds and wrinkles. **D 3775**

count, *n*—*in knitted fabrics*, the number (counted units) of wale loops and course loops per 25 mm (1 in.). **D 3787**

course, *n*—*in knitted fabrics*, a row of successive loops in the width direction of the fabric. **D 2594**

crease retention, *n*—that property of a fabric which enables it to maintain an inserted crease. **D 4850**

critical defect, *n*—a serious defect that judgment and experience indicate is likely to prevent the usability or proper performance of a product from its intended purpose. **D 5430**

cut, *n*—*as applied to woven fabric*, a length approximately 60 yard in the greige. **D 4850**

cut strip test, *n*—*in fabric testing*, a strip test in which the specimen is cut to the specified testing width. **D 5035**

defect, *n*—*in inspection and grading*, the departure or non-conformance of some characteristic from its intended level or state.

DISCUSSION—In inspection and grading the characteristic is usually a visual one. However, defects such as heat damage or poorly finished textiles grading by hand may be required. **D 4850**

dimensional change, *n*—a generic term for changes in length or width of a specimen subjected to specified conditions.

DISCUSSION—Dimensional change is usually expressed as a percent of the original dimension of the specimen. When a dimension increases it is often referred to as growth. When a dimension decreases it is often referred to as shrinkage. **D 1117, D 2646**

dimensional stability, *n*—the ability of a material to retain its length and width dimensions under specified conditions.

DISCUSSION—The dimensions are length and width and the specified conditions are those of cycled humidity and temperature. **D 6207**

denim, *n*—a durable woven twill fabric, usually of all cotton or a blend of cotton and manufactured fibers, made from a variety of yarn numbers, and in various fabric weights, colors, designs, and finishes. **D 4850**

direction of slippage, *n*—*at the seam*, the line of movement parallel to either the filling or the warp on a woven fabric in which minimum force is required to produce yarn slippage.

DISCUSSION—The fabric may be pulled in both directions in many cases. **D 4034**

distortion, *n*—*in fabrics*, a general term for a visible defect in the texture of a fabric.

DISCUSSION—For the purpose of Test Methods **D 3939** and **D 5362**, snags are composed of different combinations of protrusions and distortions. A distortion is characterized by a group of fibers, yarn, or a yarn segment that is displaced from its normal pattern so that there is a visible change in the texture of the fabric; however, the displaced group of fibers, yarn, or yarn segment does not extend above the fabric surface. Distortions include conditions where (1) tension on a snagged yarn has changed the size of some loops within a knitted fabric and the

result is a pucker on the surface of the fabric, and (2) tension on a snagged yarn has caused a yarn to break off within a woven fabric and the result is a change in the texture where the yarn used to be.

D 3939, D 5362

double bow, *n*—two fabric bows, arcing in the same direction, as in a flattened M or W depending on the viewing angle. (Compare **double reverse bow** and **double bow**.)

DISCUSSION—In tubular knits, there may be differential bowing between the top and the bottom of the tube. **D 3882, D 3990**

double hooked bow, *n*—one hooked bow at each side of the fabric that arc in opposite directions. (See also **hooked bow**.)

D 3882, D 3990

double reverse bow, *n*—two fabric bows arcing in opposite directions. (See also **bow**. Compare **double bow**.) **D 3882**

double-stroke, *n*—*in flex and abrasion testing*, an abrasion cycle that consists of one forward and one backward motion. **D 3885**

duck, *n*—a compact, firm, heavy, plain-weave cotton fabric, mass per square yard 6 to 50 oz. (See also **flat duck**, and **plied yarn duck**.) **D 4850**

durable-press, *adj*—having the ability to retain substantially the initial shape, flat seams, pressed-in creases, and unwrinkled appearance during use and after laundering or drycleaning. (See **wash and wear**.)

DISCUSSION—The use of the term **permanent-press**, *adj*, as a substitute for **durable-press** is not recommended. **D 4850**

elastic fabric, *n*—a fabric made from an elastomer either alone or in combination with other textiles.

DISCUSSION—At room temperature an elastic fabric will stretch under tension and will return quickly and forcibly to substantially its original dimensions and shape when tension is removed.

Elastic fabrics may be manufactured by weaving, braiding, knitting, or other processes. **D 1775, D 4850, D 4964**

elastic tape, *n*—a tape containing rubber or other elastomers to permit rubber-like stretch in at least one direction. **D 4850**

elastic webbing, *n*—a webbing containing rubber or other elastomers to permit rubber-like stretch in at least one direction. **D 4850**

end, *n*—*in woven fabric*, an individual warp yarn (single or ply) or cord. **D 3775**

end count, *n*—*in woven fabric*, the number of individual warp yarns per inch of fabric regardless of whether they are comprised of single or plied components **D 3775**

fabric, *n*—*in textiles*, a planar structure consisting of yarns or fibers. **D 737, D 1388, D 1424, D 4850, D 5587**

fabric growth, *n*—the increase in the original length of a specimen after the application of a specified force for a prescribed time and the subsequent removal of the tension.

DISCUSSION—Fabric growth usually is expressed as a percentage of the length of the specimen prior to application of the force. (See also **permanent deformation**.) **D 2594, D 3107**

fabric roof-system, *n*—a system of coated fabric or laminated fabric along with support cables, edge ropes, clamps, neoprene, roof drains, arch wear strips, and anchor bolts that constitutes the outside top covering of a building. **D 4851**



fabric stretch, *n*—the increase in length of a specimen of fabric resulting from a force applied under specified conditions.

DISCUSSION—The difference is usually expressed as a percentage of the initial length of the fabric specimen. Fabric stretch differs from fabric elongation in that the latter (up to the point of rupture) reflects the instantaneously existing amount of stretch under a constantly increasing tension force. **D 2594, D 3107**

fatiguing force, *n*—*in testing sewn seams*, the force that is repeatedly applied to a test specimen. **D 4033**

filler, *n*—*in testing sewn seams* nonfibrous material, such as insoluble clays or gypsum, together with starches, gums, and so forth, added to a fabric to increase its weight or to modify the appearance or handle of the fabric. (*Syn.* back-sizing.) (Compare **sizing**.) **D 4850**

filling, *n*—*in woven fabric*, an individual yarn running from selvage to selvage at right angles to the warp in a woven fabric. **D 3775**

filling elongation and tension, *n*—stretch or tension measured at right angles to the warp direction of the fabric. **D 1775**

filling-faced twill, *n*—a weave in which filling yarns float over warp yarns, to produce a diagonal effect in the resulting fabric. (See also **twill weave** and **warp faced twill**.) **D 4850**

filling tests, *n*—*in fabric testing*, tests in which the filling yarns are torn. **D 1424**

filling-to-filling seam, *n*—a sewn seam in which the yarns in the filling direction on both sides of the sewn seam are perpendicular to the seam. **D 4033**

finished fabric weight, *n*—mass per unit area expressed in grams per square metre (ounces per square yard), grams per linear metre (ounces per linear yard), or inversely as metres per kilogram (linear yards per pound), or square metres per kilogram (square yards per pound). **D 3887**

finished yield, *n*—*in knitted fabrics*, the number of finished square metres per kilogram (square yards per pound) of finished fabric. **D 3887**

flagging, *n*—*in sewn seams*, a mode of failure evidenced by slippage of one or more yarns entirely out of the original seam. **D 4033**

flat duck, *n*—duck fabric having the warp of two single yarns woven as one and either single or plied filling yarn. (See also **duck**.) **D 4850**

flexibility, *n*—that property of a material to endure repeated flexing, bending, or bowing without rupture. **D 3885, D 4850**

flexural rigidity, *n*—*general*—resistance to bending; *specific*—work per unit width which is required to bend a fabric to unit radius of curvature. **D 1388**

float, *n*—*in woven fabric*, the portion of a warp or filling yarn that extends unbound over two or more filling or warp yarns. **D 4850**

force-recovery cycle, *n*—*in elastic fabric testing*, a continuous curve or plot of force versus elongation (with movement stopped momentarily at point of reversal) describing the elongation and recovery of an elastic fabric; also known as the loading and unloading cycle. **D 1775**

gage, *n*—*in knitted fabrics*, a measure of fineness expressing the number of needles per unit of width (across the wales). **D 4850**

gage, *n*—*in full-fashioned hosiery*, a measure of fineness expressing the number of needles per 38 m (1.5 in.) on the needle bar. **D 4850**

gage, *n*—*in warp knitting*, for simplex, tricot, milanese, number of needles per English inch; for raschel, kayloom, twice the number of needles per English inch. **D 4850**

gaiting, *n*—*in warp knitting*, the setting of a guide bar one or more needle spaces to the right or left in order to increase the pattern possibilities. **D 4850**

grab test, *n*—*in fabric testing*, a tensile test in which the central part of the width of the specimen is gripped in the clamps.

DISCUSSION—For example, if the specimen width is 100 mm (4.0 in.) and the width of the jaw faces 25 mm (1.0 in.), the specimen is gripped in the clamp with approximately 37.5 mm (1.5 in.) of fabric protruding from each side of the jaws. **D 4850, D 5034**

grade, *n*—*in warp knitting*, a term used to indicate the defect index evaluation of fabric determined by the number of defects per unit, for example per pound, per linear yard, or per square yard. **D 4350, D 4850**

grade, *v*—to assign a numerical value based on number, size, and severity of defects seen during a visual inspection. **D 5430**

growth, *n*—*of textiles*, the difference between the original length of a specimen and its length after the application of a specified force for a prescribed time, and the subsequent removal of the force. (See also **permanent deformation** and **dimensional change**.) **D 2594, D 3107**

hooked bow, *n*—a fabric condition in which the filling yarns or knitted courses are in the proper position for most of the fabric width but are pulled out of alignment at one side of the fabric. (See also **double hooked bow**.) **D 3882**

impregnated fabric, *n*—a fabric in which the interstices between the yarns are completely filled with the impregnating compound throughout the thickness of the fabric, as distinguished from sized or coated fabrics, where these interstices are not completely filled.

DISCUSSION—A fabric woven from impregnated yarns, but not impregnated after weaving, is not an impregnated fabric. **D 4850**

inspection, *n*—the process of measuring, examining, testing, gaging, or otherwise comparing a characteristic or property of a material with applicable requirements. In this case only by visual examination. **D 5430**

jacket, *n*—a textile, woven or felted into tubular or sleeve form, ready for covering and shrinking on a machine roll. **D 4850**

knitted fabric, *n*—a structure produced by interlooping one or more ends of yarn or comparable material. **D 3786, D 3787, D 3789, D 3882, D 3887, D 4850, D 5378**

laid fabric, *n*—a fabric made without filling yarn, the parallel warp yarns being held together by means of rubber latex or other binding material. **D 4850**

laminated fabric, *n*—*in fabric roof systems*, a flexible fabric system composed of superimposed layers of fabric firmly