Dictionary

of Fiber & Textile Technology

Team NZ 2003
PGR2025-00062
Page 1

To the best of our knowledge, the information contained herein is accurate. However, neither Hoechst Celanese Corporation nor any of its divisions or affiliates can accept liability of any kind for the accuracy or completeness thereof. Final determination of the suitability of any information or material for the use contemplated, of its manner of use, and whether the suggested use infringes any patents is the sole responsibility of the user.

Copyright 1989, 1990 Hoechst Celanese Corporation. All rights reserved.
Copyright 1965, 1967, 1974, 1978 Celanese Corporation. All rights reserved

Copies of this book may be ordered through your Hoechst Celanese Film & Fibers Group representative or from:

Product/Technical Communications Services, IZ 503
Hoechst Celanese Corporation
P O Box 32414
Charlotte, NC 28232
704 554 3081
FAX 704 554 3885

Acknowledgements

We wish to express our gratitude to those whose contributions to this edition of the Dictionary of Fiber and Textile Technology have helped to make it current and accurate.

Association of the Nonwoven Fabrics Industry

Bibb Manufacturing Company

John W. Gauthier
John Gauthier Marketing Support Services

Jordan Levin
Fabric Development, Inc.

Janice Maiden
Textile Technologies, Inc.

Rick Nye
Samson Ocean Systems

Marlene Paul
Lockheed Aeronautical Systems

Herbert T. Pratt
ASTM, SC D 13.92, Terminology

Garrett C. Sharpless
Fiber Innovations, Inc.

Randal W. Spencer
Concordia Manufacturing Company, Inc.

Special thanks to the numerous Hoechst Celanese employees who contributed terms and reviewed the changes in this new edition.

Team NZ 2003
PGR2025-00062
Page 2

Naphthol Dyes: A type of azo compound formed on the fiber by first treating the fiber with a phenolic compound. The fiber is then immersed in a second solution containing a diazonium salt that reacts with the phenolic compound to produce a colored azo compound. Since the phenolic compound is dissolved in caustic solution, these dyes are mainly used for cellulose fibers, although other fibers can be dyed by modifying the process. (Also see DYES, Developed Dyes.)

Premetallized Dyes: Acid dyes that are treated with coordinating metals such as chromium. This type of dye has much better wetfastness than regular acid dye. Premetallized dyes are used on nylon, silk, and wool.

Sulfur Dyes: A class of water-insoluble dyes that are applied in a soluble, reduced form from a sodium sulfide solution and are then reoxidized to the insoluble form on the fiber. Sulfur dyes are mainly used on cotton for economical dark shades of moderate to good fastness to washing and light. They generally give very poor fastness to chlorine.

Vat Dyes: A class of water-insoluble dyes which are applied to the fiber in a reduced, soluble form (leuco compound) and then reoxidized to the original insoluble form. Vat dyes are among the most resistant dyes to both washing and sunlight. They are widely used on cotton, linen, rayon, and other cellulosic fibers.

DYE SITES: Functional groups within a fiber that provide sites for chemical bonding with the dye molecule. Dye sites may be either in the polymer chain or in chemical additives included in the fiber.

DYESTUFF: See DYES.

DYNAMIC ADHESION: The ability of a cord-to-rubber bond to resist degradation resulting from flexure.

DYNAPOINT PROCESS: A continuous computer-controlled process for manufacturing tufted carpets with intricate patterns from undyed yarn. The carpet is dyed as it is tufted and the colors and pattern are clearly visible through the primary backing of the carpet.

E

EASE-OF-CARE: A term used to characterize fabrics that, after laundering, can be restored to their original appearance with a minimum of ironing or other treatment. An ease-of-care fabric generally wrinkles only slightly upon laundering. (Also see DURABLE PRESS and WASH-AND-WEAR.)

EASY-CARE: See EASE-OF-CARE.

EDGE CRIMPING: See TEXTURING, Edge Crimping Method.

EDGE ROLL: The curl that develops at the edge of a single-knit fabric preventing it from lying flat.

ELASTICITY: The ability of a strained material to recover its original size and shape immediately after removal of the stress that causes deformation.

ELASTICIZED FABRIC: A fabric that contains elastic threads. Such fabrics are used for girdles, garters, and similar items.

ELASTIC LIMIT: In strength and stretch testing, the load below which the specimen shows elasticity and above which it shows permanent deformation. (Also see YIELD POINT.)

ELASTIC RECOVERY: The degree to which a fiber, yarn, or cord returns to its original size and shape after deformation from stress.

ELASTOMERS: Synthetic polymers having properties of natural rubber such as high stretchability and recovery.

ELECTRICAL CONDUCTIVITY: 1. A measure of the ease of transporting electric charge from one point to another in an electric field. **2.** The reciprocal of resistivity.

ELECTRICAL FINISH: A finish designed to increase or maintain electrical resistivity of a textile material.

ELECTRICAL RESISTIVITY: The resistance to longitudinal electrical flow through a uniform rod of unit length and unit cross-sectional area.

ELMENDORF TEAR TESTER: A tester designed to determine the tearing strength of paper. It is also used to measure the tearing strength of very lightweight fabrics and resin-finished apparel fabrics. A trapezoidal fabric sample is employed.

ELONGATION: The deformation in the direction of load caused by a tensile force. Elongation is measured in units of length (e.g., millimeters, inches) or calculated as a percentage of the original specimen length. Elongation may be measured at any specified load or at the breaking load.

ELONGATION AT BREAK: The increase in length when the last component of the specimen breaks.

EMBOSSING: A calendering process for producing raised or projected figures or designs in relief on fabric surfaces. Embossed surfaces are usually produced on fabrics by engraved, heated rollers that give a raised effect. Embossed velvet or plush is made by shearing the pile to different levels or by pressing part of the pile flat.

EMBROIDERY: Ornamental designs worked on a fabric with threads. Embroidery may be done either by hand or by machine.

EMULSION: A suspension of finely divided liquid droplets in a second liquid, i.e., oil in water or vice versa.

EMULSION POLYMERIZATION: A three-phase reaction system consisting of monomer, an aqueous phase containing the initiator, and colloidal particles

Team NZ 2003
PGR2025-00062
Page 3

MISPICK: A weaving defect in which a pick is improperly interlaced, resulting in a break in the weave pattern. Mispicks can result from starting the loom on the incorrect pick after a pick-out.

MISSING END: See END OUT.

MISS-STITCH: A knitting construction formed when the needle holds the old loop and does not receive new yarn. It connects two loops of the same course that are not in adjacent wales. Also known as float-stitch.

MIXED END or FILLING: Warp or filling yarn differing from that normally used in the fabric, e.g., yarn with the incorrect twist or number of plies, yarn of the wrong color, or yarn from the wrong lot.

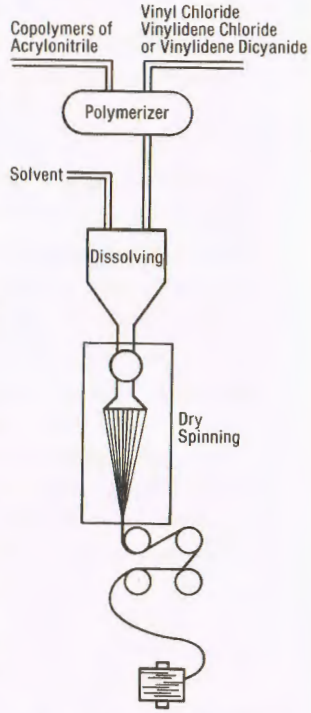
MOCK DYEING: A heat stabilization process for yarns. The yarns are wound onto packages and subjected to package dyeing conditions (water, pressure, temperature) but without dye and chemicals in the bath.

MOCK LENO: A combination of weaves having interlacings that tend to form the warp ends into groups (with empty spaces intervening) in the cloth, thereby giving an imitation of the open structure that is characteristic of leno fabrics. Mock leno fabrics are used for summer shirts, dresses, and other apparel, and as a shading medium in Jacquard designs.

MODACRYLIC FIBER: A manufactured fiber in which the fiber-forming substance is any long chain synthetic polymer composed of less than 85% but at least 35% by weight of acrylonitrile units (FTC definition). Both wet and dry spinning are used.

CHARACTERISTICS: Although modacrylics are similar to acrylics in properties and applications, certain important differences exist. Modacrylics have superior resistance to chemicals and combustion, but they are more heat sensitive (lower safe ironing temperature) and have a higher specific gravity (less cover).

END USES: The principal applications of modacrylic fibers are in pile fabrics, flame-retardant garments, draperies, and carpets.



Modacrylic Fiber Production

MODULUS: The ratio of change in stress to change in strain following the removal of crimp from the material being tested; i.e., the ratio of the stress expressed in either force per unit linear density or force per unit area of the original specimen, and the strain expressed as either a fraction of the original length or percentage elongation. (Also see YOUNG'S MODULUS.)

MOHAIR: See ANGORA, 1.

MOIRÉ: A wavy or watered effect on a textile fabric, especially a corded fabric of silk, rayon, or one of the manufactured fibers. Moiré is produced by passing the fabric between engraved cylinders which press the design into the material, causing the crushed and uncrushed parts to reflect light differently.

MOISTURE-FREE WEIGHT: 1. The constant weight of a specimen obtained by drying at a temperature of 105°C in a current of desiccated air. **2.** The weight of a dry substance calculated from an independent determination of moisture content (e.g., by distillation with an immiscible solvent or by titration with Fischer reagent).

MOISTURE PROPERTIES: All fibers when exposed to the atmosphere pick up some moisture; the quantity varies with the fiber type, temperature, and relative humidity. Measurements are generally made at standard conditions, which are fixed at 65% RH and 70°F. Moisture content of a fiber or yarn is usually expressed in terms of percentage regain after partial drying.

MOISTURE REGAIN: The percentage of moisture in a textile material brought into equilibrium with a standard atmosphere after partial drying, calculated as a percentage of the moisture-free weight. (Also see STANDARD MOISTURE REGAIN.)

MOLESKIN: A heavy sateen-weave fabric made with heavy, soft-spun filling yarns. The fabric is sheared and napped to produce a suede effect.

MONK'S CLOTH: A rough, substantial, rather bulky fabric made of very coarse yarn in a 4-and-4 or similar basket-weave construction.

MONOFIL: See MONOFILAMENT.

MONOFILAMENT: Any single filament of a manufactured fiber, usually of a denier higher than 14. Instead of a group of filaments being extruded through a spinneret to form a yarn, monofilaments generally are spun individually. Monofilaments can be used for textiles such as hosiery or sewing thread or for nontextile uses such as bristles, papermaker's felts, fishing lines, etc.

MONOMER: The simple, unpolymerized form of a compound from which a polymer can be made.

MORDANT: A chemical used in some textile fibers to provide affinity for dyes.

MORESQUE: A multicolored yarn formed by twisting or plying single strands of different colors.

MORPHOLOGY: The study of the fine structure of a fiber or other material.

MOTE: A small piece of seed or vegetable matter in cotton. Motes are removed by boiling the fiber or fabric in sodium hydroxide, then bleaching. When not removed, they can leave a dark spot in the fabric.

MUFF: A loose skein of textured yarn prepared for dyeing or bulking. In the bulking operation, the yarn contracts and the resulting skein resembles a muff.

MUFF DYEING: See DYEING.

Team NZ 2003
PGR2025-00062
Page 4

STAINING: The undesired pickup of color by a fabric: (1) when immersed in water, dry-cleaning solvent, or similar liquid medium that contains dyestuffs or coloring material not intended for coloring the fabric; or (2) by direct contact with other dyed material from which color is transferred by bleeding or sublimation.

STAINLESS-STEEL FIBER: Textile fibers made of stainless steel. Steel fibers are used for antistatic purposes in carpets, for tire belt construction, and for high-temperature or heat-resistant end uses.

STANDARD ATMOSPHERE: Air maintained at 70°F (21°C) and 65% relative humidity. When international testing is involved, a standard temperature of 20°C or, by agreement, 27°C may be used. Special humidity and temperature conditions are sometimes prescribed for the testing of certain textiles for specific service predictions, resistance to water or biological action, etc.

STANDARD CONDITION: Standard condition is that reached by a specimen when it is in moisture equilibrium with a standard atmosphere. Standard condition is seldom realized in practice since laboratory atmospheres are continually fluctuating between narrow limits, and it is not practical to wait for the attainment of moisture equilibrium which would require several days or more for tightly wound samples of high regain material. Practically, specimens are brought to moisture equilibrium in the standard atmosphere for testing as defined in these definitions. The term "standard condition" should not be used as a synonym for the concept of "standard atmosphere."

STANDARD DEVIATION: A measure of the dispersion of a set of numbers based on the difference of the individual numbers from the mean.

STANDARD MOISTURE REGAIN: Accepted moisture allowance for textile materials expressed in percentages of their dry weight.

STANDING WIRE: A broad term describing fixed rods or strips extending through the loom reed, that control the height of the pile in a woven pile fabric.

STAPLE: Natural fibers or cut lengths from filaments. The staple length of natural fibers varies from less than 1 inch as with some cotton fibers to several feet for some hard fibers. Manufactured staple fibers are cut to a definite length, from 8 inches down to about 1-1/2 inches (occasionally down to 1 inch), so that they can be processed on cotton, woolen, or worsted yarn spinning systems. The term staple (fiber) is used in the textile industry to distinguish natural or cut length manufactured fibers from filament.

STAPLE FABRIC: See SPUN FABRIC.

STAPLE FIBER: See STAPLE.

STAPLE PROCESSING: The conversion of staple into spun yarns suitable in evenness, size, twist, and strength for use in the weaving or knitting of fabrics. (Also see TEXTILE PROCESSING.)

STAPLE YARN: See SPUN YARN.

STARCH LUMP: See HARD SIZE.

START-UP MARK: See SET MARK.

STATIC: An accumulation of negative or positive electricity on the surface of fibers or fabrics because of inadequate electrical dissipation during processing. Static results in an electrical attraction or repulsion of the fibers relative to themselves, to machine parts, or to other materials, preventing the fiber from traveling in a normal path in the process.

STATIC ADHESION: In tire cord, the measurement of the strength of a cord-to-rubber bond under static conditions or very low strain rate.

STATIC CRACK: See SHIER.

STEAM CHEST: A steam-heated cabinet used in manufactured fiber production. Usually refers to the heated cabinet in which spin-drawing is done or to the cabinet around a stuffer-box crimper.

STENTER: See TENTER FRAME.

STICKER: 1. A distortion in the weave characterized by tight and slack places in the same warp yarns. The principal causes are rolled ends on the beam, warp ends restricted by broken filament slubs, and knots catching at lease rods, drop wires, heddles, or reeds. (Also see DRAW-BACK.) **2.** See HARD SIZE.

STIFFNESS: The property of a fiber or fabric to resist bending or to carry a load without deformation. It is based on the fiber modulus.

STITCH BONDING: See BONDING, 2.

STITCHING: The process of passing a fiber or thread through the thickness of fabric layers to secure them. In composite manufacture, stitching is used to make preforms or to improve damage tolerance of complex-shaped parts.

STOCK DYEING: See DYEING.

STOCKINETTE: A knit fabric in tubular or flat form made with a plain stitch from yarns of wool, cotton, manufactured fibers, or a combination of these fibers. Stockinette fabrics are used for underwear, industrial applications, and other purposes. In heavier constructions, dyed and napped stockinette finds apparel uses. (Also spelled stockinet.)

STOLL-QUARTERMASTER UNIVERSAL WEAR TESTER: A versatile testing apparatus for measuring wear resistance of fabrics, yarns, thread, etc. It can be equipped with either of two testing heads, one for testing abrasion resistance of flat surfaces and the other for testing resistance to flexing and abrasion. (See diagram on next page.)

STOP MOTION: Any device that automatically stops a textile machine's operation on the occurrence of a yarn break, a high defect count, etc.

STRAIN RECOVERY CURVE: See TENSILE HYSTERESIS CURVE.

Team NZ 2003
PGR2025-00062
Page 5