

MAN-MADE FIBER AND TEXTILE DICTIONARY

NOTE: This exhibit is identical to exhibit no. 2017 marked during the December 3, 2013, cross-examination deposition of Sabit Adanur, except for the inclusion of this note and the addition of a footer to comply with 37 CFR §42.63(d).



CELANESE
CORPORATION



MAN-MADE FIBER
AND
TEXTILE DICTIONARY

CELANESE CORPORATION

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FOREWORD

This Man-Made Fiber and Textile Dictionary is presented to you as a convenient reference for textile terminology, with special emphasis on man-made fibers. It attempts to convey as much basic information as is possible without making the book cumbersome. The first and second editions were published to provide a source for Celanese personnel. The third edition was published in response to numerous requests from our customers and others in the textile industry for an up-to-date glossary of terms encountered in the man-made fiber and textile trades. To enhance its usefulness, the dictionary has been revised, expanded, and illustrated.

Generic terms such as *dyeing* and *knitting* are handled comprehensively with specific terms presented under one heading. The more widely used man-made fibers are listed by their Federal Trade Commission generic names and definitions, in most cases followed by a brief description of their manufacture, characteristics, and applications. Our more familiar fiber and fabric trademarks, along with those of Fiber Industries, our subsidiary, are listed in the Appendix. Also given in the Appendix are abbreviations, equivalent weights and measures, and various conversion tables and formulas needed by the textile technologist.

We hope that this dictionary will familiarize the reader with the language of textiles. Only through you, the user, can we determine its value, and we therefore invite your comments.

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CHELATING AGENT: A compound that will inactivate a metallic ion by making it an integral part of an inner ring structure. The metal is attached by coordinate links to two or more nonmetal atoms in the same molecule.

CHEMICAL CRIMPING: A crinkled or puckered effect in fabric obtained by printing sodium hydroxide onto the goods in a planned design. When the material is washed, the part to which the paste has been applied will shrink and cause untreated areas to pucker. The same effect is obtained with a caustic resist print and a sodium hydroxide bath.

CHEMICAL FIBER: See MAN-MADE FIBER.

CHEMICAL STABILITY: Degree of resistance of a material to chemicals, such as acids, bases, solvents, oils, and oxidizing agents, and to chemical reactions, including those catalyzed by light.

CHENILLE: 1. A yarn with a fuzzy pile protruding from all sides, cut from a woven chenille weft fabric. Chenille yarns are made from all fibers, and they are used as filling in fabrics and for embroidery, fringes, and tassels. 2. Fabric woven with chenille yarns. (Also see TUFTED FABRIC.)

CHEVIOT: A rugged tweed made from uneven yarn, this fabric usually has a rather harsh hand.

CHEVRON: A broad term applied to prints in zigzag stripes or to herringbone weaves.

CHIFFON: A plain-weave, lightweight, sheer, transparent fabric made from fine, highly twisted yarns. It is usually a square fabric, i.e., having approximately the same number of ends and picks and the same count in both warp and filling.

CHINCHILLA CLOTH: A heavy, twill-weave fabric with a napped surface that is rolled into little tufts or nubs. The material is frequently double faced with a knitted or woven plaid back. Chinchilla cloth is used primarily in coats.

CHINO: A cotton or cotton blend twill used by armies throughout the world for summer-weight uniforms. Chino is frequently dyed khaki.

CHINTZ: A glazed fabric produced by friction calendering. Unglazed chintz is called cretonne.

CHIPS: 1. The form of polymer feedstock used in fiber production. Also see FLAKE. 2. The feedstock for a pulp digester. 3. A defect in a nonwoven fabric.

CHLORINE RETENTION: A characteristic of several resins and textile finishes whereby they retain some of the chlorine from bleach. On heating of the goods, the chlorine forms hydrochloric acid, causing tendering of the cloth. This is especially true of certain wrinkle resistant finishes for cotton and rayon.

CHOKED COILER: A condition in carding or drawing in which sliver is either puffy, badly condensed, or very uneven, leading to overloading of the coiler trumpets and causing work stoppage.

CHOKED FLYERS: A situation in which roving will not pass through the flyer channels because of heavy or cockled conditions caused by such factors as uneven drafting, waste, overcut fibers, and improper finish.

CHROMATICITY: The quality of color expressed as a function of wavelength and purity.

CHROMATOGRAPHY: The generic name of a group of processes for separating and analyzing mixtures of chemical compounds. The separation depends on the redistribution of molecules of the mixture between phases, one of which is thin, often reaching molecular dimensions. For this reason, molecular size and shape are important in the separation and extremely subtle separations are possible.

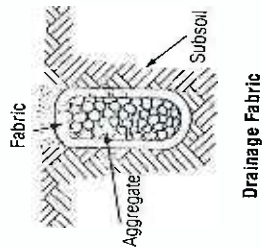
CIRCULAR-KNIT FABRIC: A tubular weft-knit fabric made on a circular-knitting machine.

CIRCULAR KNITTING: See KNITTING.

CIRE: A brilliant patent leather effect produced by application of wax, heat, and pressure.

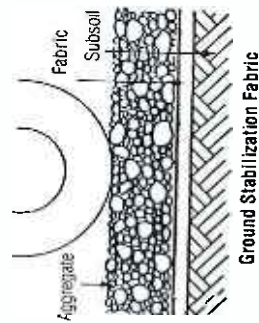
CIVIL ENGINEERING FABRICS: A broad term referring to a variety of fabrics used in construction.

Drainage Fabrics: Fabrics used as the filter medium in subgrade drainage structures. The fabric can be wrapped around a drain pipe or coarse stone to form a subsurface drain; the fabric allows water to pass freely from the soil into the drain but prevents soil particles from migrating into the drain system.



Erosion Control Fabrics: Fabrics used in the stabilization of embankments and the containment of silt run-off from erodible slopes. In embankment stabilization, the fabric functions as a filter medium behind stabilizing rip-rap revetments. In siltation control, the fabric acts as a filter to contain silt while allowing excess water to drain freely from the site.

Ground Stabilization Fabrics: Fabrics used in the construction of access roads, railroads, parking and storage areas over soft, unstable soils. The fabric is placed between the subgrade and the stabilizing fill material where it provides separation of subsoil and fill, filtration of moisture at the subsoil/fill interface and added tensile reinforcement of the compacted fill.

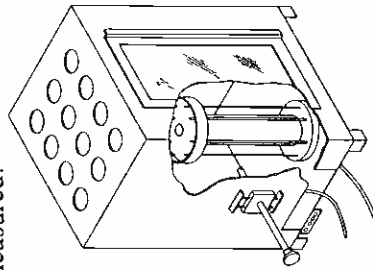


CLAMPS: The parts of a testing machine which are used to hold a specimen while it is subjected to force. (Also called jaws.)

CLARITY: 1. In general, the optical property of being clear. 2. In acetate manufacture, a measure of the appearance of dope solutions, indicating

Methenamine Pill Test: A test for the flame resistance of carpets or rugs in which a methenamine tablet is ignited on a test sample under controlled conditions and the size of the burn hole is measured.

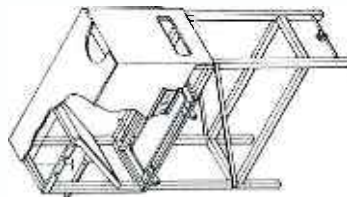
Mushroom Apparel Flammability Test: This test method involves igniting a cylinder of fabric around a core containing heat sensors. The rate of heat transfer from the burning material to the sensors is measured.



Mushroom Apparel Flammability Tester

Radiant Panel Test: A test for the flammability of carpets or rugs in which the specimen is mounted on the floor of the test chamber and exposed to intense radiant heat from above. The rate of flame spread is assessed.

Smoke Chamber Test: This method assesses the smoke generating characteristics of a sample due to pyrolysis and combustion by measuring the attenuation of a light beam by smoke accumulating in a closed chamber under controlled conditions. Results are expressed in terms of specific optical density.



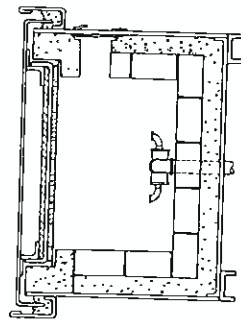
Radiant Panel Test Apparatus

Tablet Test: See FLAMMABILITY TESTS, Methenamine Pill Test.

Thermo-Man: This instrumented mannequin system, interfaced with a computer, allows full-scale testing of garments for protection capability or degree of flammability. The system was developed by Accurex Corporation for the U. S. Air Force and is exceedingly expensive.

Tunnel Test: Test for the flammability of floor coverings in which a sample is placed on the ceiling of a tunnel of specified dimensions and ignited under controlled conditions to determine the extent to which it will burn. (Also sometimes called Steiner tunnel test.)

Vertical Flame Test: A test for flame resistance in which a specimen is mounted in a vertical holder and exposed to an open flame for a specific time. Flaming time and char length after the flame extinguishes are measured.



Tunnel Test Apparatus

FLANGE CRIMPING: Simultaneous crimping of two ends of yarn by using heated snubber pins, then combining both ends on a draw roll after they contact a rubber flange on the draw roll.

FLANNEL: Medium weight plain or twill weave, slightly napped fabric, usually of wool, but may be made of other fibers.

FLAPPER: The movable side of a fiber-crimping chamber which periodically opens or flaps to permit crimped fiber to be expelled from the chamber.

FLASH AGEING: A process for rapid reduction and fixation of vat dyes obtained when the printed fabric is padded with caustic soda and sodium hydrosulfite and immediately steamed in air-free steam.

FLASH SPINNING: See SPINNING, 5.

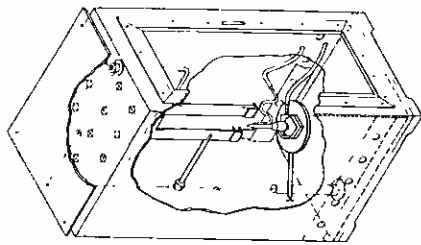
FLAT: In carding, one of the parts forming an endless chain which partially surrounds the upper portion of the cylinder and gives the name to a revolving flat card. Flats are made of cast iron, T-shaped in section, about 1 inch wide, and as long as the width of the cylinder. One side of the flat is nearly covered with fine card clothing, and the flats are set close to the teeth of the cylinder so as to work point against point. A chain of flats contains approximately 110 flats and operates at a surface speed of about 3 inches per minute.

FLAT ABRASION TESTER: See STOLL-QUARTERMASTER UNIVERSAL WEAR TESTER.

FLAT DUCK: See DUCK.

FLAT-KNIT FABRIC: 1. A fabric made on a flat-knitting machine, as distinguished from tubular fabrics made on a circular-knitting machine. While tricot and milanese warp-knit fabrics (non-run) are knit in flat form, the trade uses the term flat-knit fabric to refer to weft-knit fabrics made on a flat machine, rather than warp-knit fabrics. 2. A term used in the underwear trade for plain-stitch fabrics made on a circular-knitting machine. These fabrics have a flat surface and are often called flat-knit

Vertical Flame Test Apparatus



fabrics to differentiate them from ribbed-knit or Swiss rib fabrics. In this case, the term refers to the texture, not the type of machine on which the fabric was knit.

FLAT KNITTING: See KNITTING.

FLAT-KNITTING MACHINE: A weft-knitting machine with needles arranged in a straight line in a flat plate called the bed. The yarn travels alternately back and forth, and the fabric may be shaped or varied in width, as desired, during the knitting process. Lengthwise edges are selvages. Flat-knitting machines may be divided into two types: latch-needle machines for sweaters, scarves, and similar articles and fine spring-needle machines for full-fashioned hosiery.

FLATSPOTTING: A characteristic of certain tire cords. It occurs with all materials but is more noticeable with nylon cord and is associated with nylon cord by users. Nylon exerts a shrinkage force as it becomes heated in tire operation. When the tire is stopped under load, the cord in the road-contact portion of the tire is under less tension than that in other portions of the tire, and it shrinks to conform to the flat surface of the road. When cooled in this position, the cord maintains the flat spot until it reaches its glass transition temperature as it will in use.

FLAT-TOP CARD: See REVOLVING FLAT CARD.

FLAX: The plant from which the cellulosic fiber linen is obtained.

FLEECE FABRIC: A fabric with a thick, heavy surface resembling sheep's wool. It may be a pile or napped fabric of either woven or knit construction.

FLEX ABRASION TESTER: See STOLL-QUARTERMASTER UNIVERSAL WEAR TESTER.

FLEXIBILITY: 1. The ability to be flexed or bowed repeatedly without rupturing. 2. A term relating to the hand of fabric, referring to ease of bending and ranging from pliable (high) to stiff (low).

FLEXURAL FATIGUE: A physical property expressed by the number of times a material can be bent on itself through a prescribed angle before it ruptures or loses its ability to recover.

FLEXURAL RIGIDITY: This measure of a material's resistance to bending is calculated by multiplying the material's weight per unit area by the cube of its bending length.

FLOAT: 1. The portion of a warp or filling yarn that extends over two or more adjacent filling picks or warp ends in weaving for the purpose of forming certain designs. 2. In a knit fabric, a portion of yarn which extends for some length without being knitted in. 3. A fabric defect consisting of an end lying or floating on the cloth surface instead of being woven in properly. Floats are usually caused by slubs, knot-tails, knots, or fly waste, or sometimes by ends being drawn in heddle eyes incorrectly or being twisted around heddle wires.

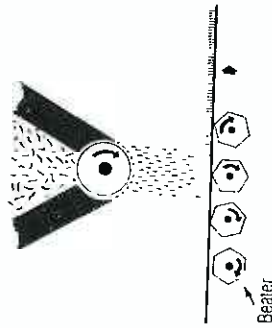
FLOATING ENDS: See FLOAT, 3.

FLOAT STITCH: See MISS-STITCH.

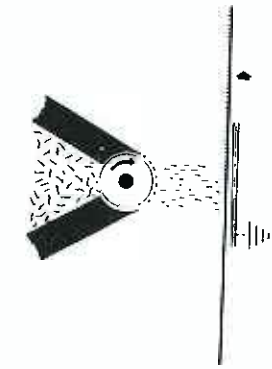
FLOCCULATING: Coagulating or coalescing a material into a small, loosely aggregated mass.

FLOCK: The material obtained by reducing textile fibers to fragments by cutting or grinding. There are two main types: precision cut flock, where all fiber lengths are approximately equal, and random cut flock, where the fibers are ground or chopped to produce a broad range of lengths.

FLOCKING: A method of cloth ornamentation in which adhesive is printed or coated on a fabric, and finely chopped fibers are applied all over by means of dusting, air-blasting, or electrostatic attraction. In flock printing, the fibers adhere only to the printed areas and are removed from the unprinted areas by mechanical action.



Mechanical Flocking



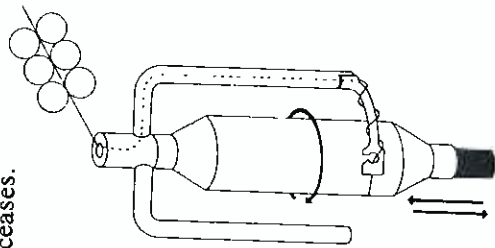
Electrostatic Flocking

FLUFFING: A term describing the appearance of a carpet after loose fiber fragments left during manufacture have worked their way to the surface. Fluffing is not a defect; it is simply a characteristic of new carpets which disappears with vacuuming.

FLUORESCENCE: Emission of electromagnetic radiation, usually as visible light, that is caused by the flow of energy into the emitting body. The emission ceases abruptly when the excitation ceases.

FLY: The short, waste fibers that are released into the air in textile processing operations such as picking, carding, spinning, and weaving.

FLYER: 1. A device used to insert twist into slubbing, roving, or yarn, and to serve as a guide for winding it onto a bobbin. The flyer is shaped like an inverted U that fits on the top of the spindle and revolves with it. One arm of the U is solid and the other is hollow. The yarn enters through the top of the hollow arm, travels downward, and emerges at the bottom where it is wound around a presser finger onto the take-up package. 2. See LOOM FLY.



Flyer Spinning

FLYER SPINNING: A method of spinning by means of a driven flyer. It is used primarily for spinning worsted and coarser yarns. (Also see FLYER, 1.)

KNITTING: A method of constructing fabric by interlocking series of loops of one or more yarns. The two major classes of knitting are warp knitting and weft knitting, as follows:

1. **Warp Knitting:** A type of knitting in which the yarns generally run lengthwise in the fabric. The yarns are prepared as warps on beams with one or more yarns for each needle. Examples of this type of knitting are tricot, milanese, and raschel knitting.

Milanese Knitting: A type of run-resistant warp knitting with a diagonal rib effect using several sets of yarns.

Raschel Knitting: A versatile type of warp knitting made in plain and Jacquard patterns; the latter can be made with intricate eyelet and lacy patterns and is often used for underwear fabrics. Raschel fabrics are coarser than other warp-knit fabrics, but a wide range of fabrics can be made. Raschel knitting machines have one or two sets of latch needles and up to thirty sets of guides.

Tricot Knitting: A run-resistant type of warp knitting in which either single or double sets of yarn are used. (Also see TRICOT.)

2. **Weft Knitting:** A common type of knitting, in which one continuous thread runs crosswise in the fabric making all of the loops in one course. Weft knitting types are circular and flat knitting.

Circular Knitting: The fabric is produced on the knitting machine in the form of a tube, the threads running continuously around the fabric.

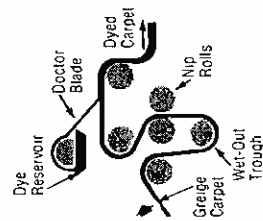
Flat Knitting: The fabric is produced on the knitting machine in flat form, the threads alternating back and forth across the fabric. The fabric can be given shape in the knitting process by increasing or decreasing loops. Full-fashioned garments are made on a flat-knitting machine. (Also see FLAT-KNIT FABRIC.)

KRAFTCORD: This yarn produced by tightly twisting plant fiber is sometimes used in carpet backings.

KRAFT PULPS: Pulps prepared in the alkaline liquor consisting of sodium hydroxide, sodium carbonate, and sodium sulfide. Also called sulfate pulp.

KRAFT YARN: A yarn made by twisting a strip of paper manufactured from kraft pulp.

KÜSTERS DYEING RANGE: Continuous dye range for carpets. The unit wets the carpet, applies dyes and auxiliary chemicals by means of a doctor blade, fixes the dyes in a festoon steamer, and washes and dries the carpet in one pass through the range. An optional auxiliary unit may be installed to randomly drip selected dyes onto the background shade for special styling effects. This process is called TAK dyeing.



Küster Carpet Dyeing Range

L

LACE: Ornamental openwork fabric, made in a variety of designs by intricate manipulation of the fiber by machine or by hand.

LACE STITCH: In this knitting stitch structure, loops are transferred from the needles on which they are made to adjacent needles to create a fabric with an open or a raised effect.

LAID-IN FABRIC: A knit fabric in which an effect yarn is tucked in, not knitted in, the fabric structure. The laid-in yarns are held in position by the knitted yarns.

LAMÉ: A fabric woven with flat metal threads, usually silver or gold, which form either the background or the pattern.

LAMINAR FLOW: Streamline flow in a viscous fluid, such as molten polymer, near a solid boundary.

LAMINATED FABRIC: See BONDED FABRIC, 1.

LAP: A continuous, considerably compressed sheet of fibers which is rolled under pressure into a cylindrical package, usually weighing between 40 and 50 pounds. The lap is used to supply the card.

LAPPING: A term describing the movement of yarn guides between needles, at right angles to the needle bar, or laterally in relation to the needle bar during warp knitting.

LAP SPLITTING: A condition caused by a lap which will not unwind in carding in the same thickness as it was wound in picking. This splitting of the sheet of fiber can result in either a thicker or thinner sheet being fed into the card.

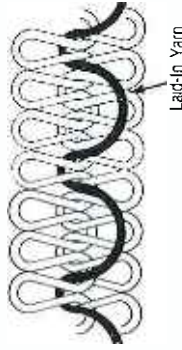
LASE: An acronym for load at specified elongation: the load required to produce a given elongation of a yarn or cord.

LASER: A device for producing an intense beam of coherent light. It is used for cutting, spectroscopy, photography, biomedical investigations, etc.

LASHED-IN FILLING: See PULLED-IN FILLING.

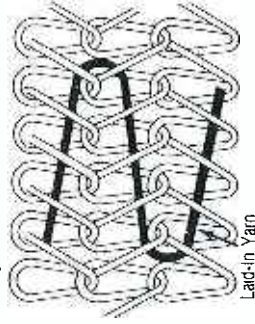
LASTRILE FIBER: A manufactured fiber in which the fiber-forming substance is a copolymer of acrylonitrile and a diene composed of at least 10% by weight but not more than 50% by weight of acrylonitrile ($-\text{CH}_2-\text{CHCN}-$) units (FTC definition).

Circular-Knit Fabric



Laid-In Yarn

Warp-Knit Fabric



Laid-In Yarn

Laid-In Constructions

LATCH NEEDLE: One of the two types of knitting machine needles. The latch needle has a small terminal hook with a latch which pivots automatically in knitting to close the hook. The fabric loop is cast off. The latch then opens, allowing a new loop to be formed by the hook, and loop-forming and casting-off proceed simultaneously. (Also see **SPRING NEEDLE**.)

LATENT CRIMP: Crimp in fibers that can be developed by a specific treatment. Fibers are prepared specially to crimp when subjected to specific conditions, e.g., tumbling in a heated chamber or wet processing.

LATEX: A milky fluid found in certain cells of some families of seed plants. Latex is the raw material from which rubber is made.

LAWN: A light thin cloth made of carded or combed yarns, this fabric is given a crease-resistant, crisp finish. Lawn is crisper than voile but not as crisp as organdy.

LEA: 1. One-seventh of a 840-yard cotton hank, i.e., 120 yards. 2. A standard skein with 80 revolutions of 1.5 yards each (total length of 120 yards). It is used for strength tests. 3. A unit of measure, 300 yards, used to determine the yarn number of linen yarn. The number of leas in one pound is the yarn number.

LEACHING: The removal of any substance or dye from textiles by the percolating action of a suitable liquid.

LEA COUNT CONSTANT: See **BREAK FACTOR**.

LEADER MARK: See **DECATING MARK**.

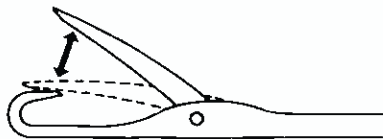
LEA PRODUCT: See **BREAK FACTOR**.

LENO WEAVE: A weave in which the warp yarns are arranged in pairs with one twisted around the other between picks of filling yarn as in marquissette. This type of weave gives firmness and strength to an open-weave fabric and prevents slippage and displacement of warp and filling yarns.

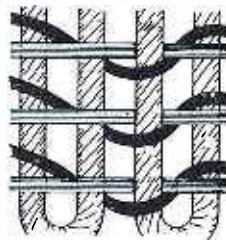
LET-OFF MOTION: A device for controlling the delivery and tension of the warp during weaving.

LEVELING: Migration leading to uniform distribution of dye in a dyed material. Leveling may be a property of the dye or it may require chemical assistance.

LEVEL LOOP: A term describing a tufted or woven carpet with uncut, equal-length loops composing the pile surface.



Head of Latch Needle



Full Leno Weave

LICKERIN: A part of the feed mechanism of the card. It consists of a hollow, metal roll with a spirally grooved surface containing a special saw-toothed wire. The lickerin opens up the tufts of the picker lap as it is fed to the card and transfers the fibers to the main cylinder.

LICKERIN LOADING: A condition whereby fibers are imbedded in the lickerin wire clothing so as to resist transfer to the cylinder clothing.

LIGHT END: 1. See **FINE END**, 1. 2. The lower boiling fraction in distillation.

LIGHTFASTNESS: The degree of resistance of dyed textile materials to the color-destroying influence of sunlight. Two methods of testing are in use: (1) exposure to sunlight, either directly or under glass, and (2) accelerated testing in a laboratory apparatus equipped with any of several types of artificial light sources.

LIGNIN: The major noncarbohydrate portion of wood. It is an amorphous polymeric substance that cements the fibrous portions together.

LIMITING OXYGEN INDEX: A relative measure of flammability that is determined as follows: A sample is ignited in an oxygen/nitrogen atmosphere. The oxygen content is adjusted until the minimum required to sustain steady burning is found. The higher the value, the lower the flammability.

LINEAR DENSITY: Mass per unit length expressed as grams per centimeter, pounds per foot, or equivalent units. It is the quotient obtained by dividing the mass of a fiber or yarn by its length.

LINEN: Cellulosic fibers derived from the stem of the flax plant or a fabric made from these fibers. Linen fibers are much stronger and more lustrous than cotton; they yield cool, absorbent fabrics that wrinkle easily. Fabrics with linen-like texture and coolness but with good wrinkle resistance can be produced from man-made fibers and blends.

LINEN LEA: The number of 300-yard hanks contained in one pound.

LINET: A French-made lining fabric of unbleached linen.

LINK-AND-LINK: See **PURL**.

LINON À JOUR: A gauze-like linen fabric used as dress goods.

LINT BALL: See **BALLING UP**.

LINTERS: The short cotton fibers which are not removed from the seed during the first ginning. The linters are cut from the seed and used as a source for cellulose derivatives such as nitrocellulose or viscose rayon.

LIQUOR RATIO: In wet processing the ratio of the weight of liquid used to the weight of goods treated.

LISLE YARN: A high-quality cotton yarn made by plying yarns spun from long combed staple. Lisle is singed to give it a smooth finish.

LIVING RING: See **REVOLVING SPINNING RING**.

LOAD-DEFORMATION CURVE: A graphical representation of the relationship between the change in dimension (in the direction of the

WARP-AND-WEAR FABRIC: A fabric that is knit with the yarns running lengthwise, e.g., tricot, milanese, and raschel.

WARP KNITTING: See **KNITTING**, 1.

WARP PILE: The extra set of warp yarns that forms the surface in a double-woven pile fabric, including types such as velvet and velour. Upholstery fabrics such as mohair, plush and friezé are produced by this method. (Also see **PILE** and **VELVET FABRIC**.)

WARP PRINTING: See **PRINTING**.

WARP SHEET: A sheet comprising several thousand ends which are combined to make up the warp during preparation for weaving or warp knitting. (Also see **WARP**.)

WARP SIZING: See **SLASHING**.

WARP STREAKS: A fabric fault which shows as bands or streaks running warpwise. Warp streaks should not be confused with reed marks.

WASH-AND-USE: A term applied to fabrics and household textiles which can be washed and placed in normal service repeatedly with little or no ironing. (Also see **WASH-AND-WEAR**.)

WASH-AND-WEAR: A generic term applied to garments which satisfactorily retain their original neat appearance after repeated wear and suitable home laundering with little or no pressing or ironing. Thus, a wash-and-wear garment will be essentially free from undesirable wrinkles both during wear and after laundering and will retain any original pressed-in creases or pleats. The garments should meet normal consumer demands for such properties as durability, color, stability, and shrinkage.

The wash-and-wear performance of a fabric or garment depends on several factors, including the types and amounts (percentages) of fibers used, the fabric construction, the finishing treatment, the presence of a colored pattern (either woven or printed), and the methods used for washing and drying. All of these factors contribute to the overall performance and determine, in any specific instance, how closely a fabric or garment will approach acceptance. This situation shows up in the variable behavior of a specific fabric or garment under different conditions and is reflected in the use of specific commercial terms. (Also see **EASE-OF-CARE** and **PERMANENT PRESS**.)

WASH-CREASE RESISTANT: See **WASH-WRINKLE RESISTANT**.

WASHFASTNESS: The resistance of a dyed fabric to loss of color or change in properties during home or commercial laundering.

WASH-WRINKLE RESISTANT: A term applied to textile fabrics which satisfactorily maintain their appearance by recovery from sharp folds imposed during laundering.

WASTE: By-products created in the manufacture of fibers, yarns, and fabrics.

WATER IMBIBITION: See **IMBIBITION**.

WATER-JET LOOM: See **JET LOOM**.

WATERLESS DYEING: See **DYEING**, Solvent Dyeing.

WATERPROOF: A term applied to materials that are impermeable to water; waterproof fabrics have had all their pores closed and are also impermeable to air and very uncomfortable.

WATER-REPELLENT: A term applied to fabrics that can shed water but are permeable to air and comfortable to wear. These fabrics are produced by treating the material with a resin, wax, or plastic finish which is not completely permanent.

WAVY CLOTH: See **BAGGY CLOTH**.

WAVY SELVAGE: See **SLACK SELVAGE**.

WEAK WEB: A web of fiber which, when being transferred from the card doffer to the calender rolls to form sliver, does not have sufficient strength from fiber cohesion or clinging entanglement to hold itself together while forming a continuous bridge in processing.

WEAK YARN: A yarn which is found to be either below standard breaking specifications or to be weak enough to cause an abnormally high degree of stops in textile processing.

WEAR TRIAL: A test for fabric wear, abrasion, flexibility, washing, crushing, creasing, etc., in which the fabric is made into a garment and actually worn for a specific time, then assessed for performance.

WEATHER-OMETER: An instrument used in measuring the weather resistance of textiles. It can simulate various weather conditions such as sunlight, rain, dew, and thermal shock. Weathering is accelerated to the degree that the effects of years under normal conditions are attained in only a few days.

WEAVE: A system or pattern of intersecting warp and filling yarns. There are three basic weaves: plain, twill, and satin. All other weaves are derived from one or more of these types. (Also see **PLAIN WEAVE**, **TWILL WEAVE**, and **SATIN WEAVE**.)

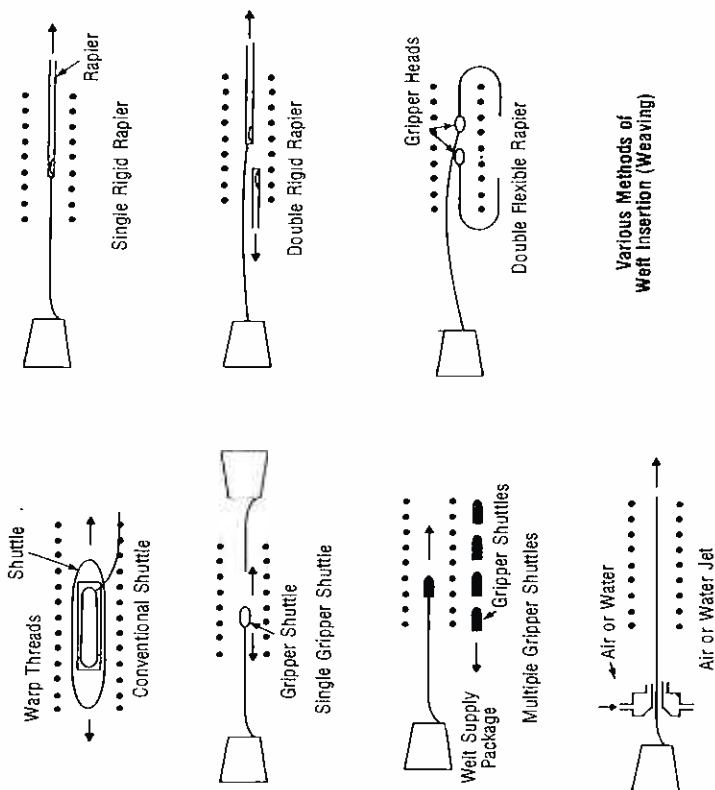
WEAVING: The method or process of interlacing two yarns of similar materials so that they cross each other at right angles to produce woven fabric. The warp yarns, or ends, run lengthwise in the fabric, and the filling threads (weft), or picks, run from side to side. Weaving may be done on a power or hand loom or by several hand methods. (Also see **LOOM** and **WOVEN FABRIC**.)

WEB: 1. The wide film of fibers that is delivered from the card. 2. A similar product of other web-forming equipment, such as that formed by air deposition and used to make nonwoven fabrics. 3. A term loosely used for lightweight nonwoven fabrics. 4. See **WEBBING**.

WEBBING: Strong, narrow fabric, closely woven in a variety of weaves and principally used for belts and straps which will have to withstand strain (e.g., automobile seat belts, reinforcement of upholstery, suspenders, etc.). Elastic webbing is made with spandex or rubber yarns in part of the warp or filling, or both. (Also see **WEB**, 2.)

WEFT: See **FILLING**.

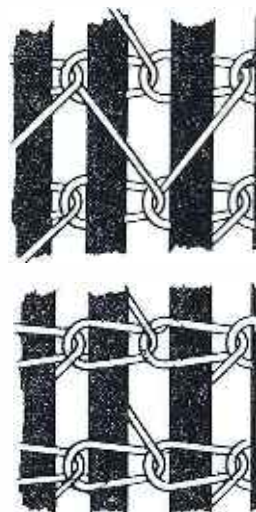
WEFT INSERTION: 1. Any one of the various methods, shuttle, rapier, water jet, etc., for making a pick during weaving. 2. A marriage of warp knitting and weaving brought about by inserting a length of yarn across the width of the knitting elements and fastening the weft yarn between the needle loop and the underlap. Also see **METAP WEAVE-KNIT PROCESS**.



WEFT-KNIT FABRIC: See **CIRCULAR-KNIT FABRIC** and **FLAT-KNIT FABRIC**, 1.

WEFT KNITTING: See **KNITTING**, 2.

WEIGHTED SILK: Silk that has been treated with metallic salts during dyeing and finishing to increase the fabric's weight and improve its drape. Over-weighting can cause deterioration of the fabric.



Fabrics Produced by Weft Insertion during Warp Knitting

WELT: 1. A finished edge on knit goods, especially hosiery. In women's stockings, it is a wide band knitted from heavier yarn than the leg and

folded on itself. 2. A small cord covered with fabric and sewn along a seam or border to add strength. 3. A seam made by folding the fabric double, generally over a cord, and sewing it. 4. A term sometimes used for pique.

WET FORMING: The production of a nonwoven fabric web from an aqueous suspension of fibers.

WET SPINNING: See **SPINNING**, 2.

WET STRENGTH: The measurement of the strength of a material when it is saturated with water, normally relative to the dry strength.

WHIPCORD: A compact woven fabric having a very steep twill on the face of the goods. Whipcord is used in dress woolens, worsteds, or wool blends and in many types of uniforms.

WHIPPED CREAM: A type of crepe fabric produced from false-twist-textured polyester yarn.

WHIPPED-IN FILLING: See **PULLED-IN FILLING**.

WHISKERS: Fine fibrils or crystals from polymers, metals, etc.

WHITE GOODS: A broad term describing any goods that have been finished in the white condition.

WICKING: 1. Cord, loosely woven or braided tape, or tubing to be cut into wicks. 2. Dispersing or spreading of moisture or liquid through a given area, vertically or horizontally; capillary action in material.

WIDTH: A horizontal measurement of a material. In woven fabric, it is the distance from selvedge to selvedge, and in flat-knit fabric, the distance from edge to edge.

WILLIAMS UNIT: A wet-processing unit for open-width processing of fabric. The fabric passes up and down over rollers in the liquor. The unit is widely used for dyeing, washing, pretreating, and aftertreating.

WILTON CARPET: A type of woven carpet in which the pile yarns are woven in as an integral part of the carpet, being held in place by the filling, usually made on a loom with a Jacquard head. The pile may be formed by wires and hooks or by weaving between two backings, in which case, the pile ends are cut to form two separate carpets. Wilton carpets are made in two types: (1) cut pile, e.g., tormaia, wilton moquette, plush, velvet, and mottled, and (2) loop pile, e.g., Brussels.



Wilton Loop Pile



Wilton Cut Pile

Wilton Carpets