GLOSSARY OF TERMS FOR THE CHEMICAL FABRICS & FILM INDUSTRY

Aging – The effect on materials of exposure to an environment for an interval of time. The process of exposing materials to an environment for an interval of time.[1]

Antimicrobial – A biocide commonly added to a polymeric compound or coating to inhibit the growth of bacteria, fungi and algae on the surface of a finished product.

Artificial Aging – The accelerated environmental exposure of materials to determine the changes of properties (dimension stability, chemical/solvent resistance, low temperature cracking, etc.).[2]

Artificial Weathering – Exposure under controlled laboratory conditions, which may be cyclic, involving changes in temperature, relative humidity, radiant energy, and any other elements found in the atmosphere in various geographical areas. Laboratory conditions are usually intensified beyond those encountered in actual outdoor exposure in an attempt to achieve an accelerated effect.[1]

Biodegradable Plastic – A degradable plastic in which the degradation (depolymerization) results from the action of naturally occurring microorganisms such as bacteria, fungi, and algae.[1]

Blocking – Unintentional adhesion between plastic films or between a film and another surface.[1]

Calendered Film – A polymeric material formed into a sheet of uniform gauge by passing through a series of precision rolls.

Calendering – Process of forming materials to make a film/sheet by passing them through a series of heated rolls with designated speeds and gaps to determine the product thickness. Calendered coated fabrics can be made by laminating a textile on line or as a separate process.

Cast Coating – A process where a liquid coating is spread on a reusable release paper, fused (cured) or dried in an oven, and then removed from the release paper as a solid film.

Cast Film – A film made by depositing a layer of plastic, either molten, in solution, or in a dispersion, onto a surface, solidifying and removing the film from the surface.[1]

Casting – Liquid plastic poured continuously on a preformed shape or texture for a mirror effect when dried and separated.

Cellular Plastics (also known as Expanded or Foamed Plastics) – All are names for a plastic containing cells (voids) dispersed throughout its mass. The cells can be interconnected (Open Cell), sealed off from one another (Closed Cell), or a combination of both. Foam density can be controlled by additives (Blowing Agents) and/or processing conditions. Cell type and foam density are important factors in determining product performance and properties.

Chemical Fabric – A composite of one or more polymer layers coated or laminated to a substrate, usually a knit, woven or non-woven fabric.

Chemical Film – A polymeric material that is formed in a sheet.

Coated Fabric – A composite of one or more polymer layers coated or laminated to a substrate, usually a knit, woven or non-woven fabric.

Coated Film – A film to which a liquid polymeric coating has been applied to the surface to affect the surface properties of the product.

Coating Operation – A process where a coating is applied to a substrate and is subsequently air dried, cured in an oven, or cured by radiation.

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Coextrusion – Process of extruding multiple films from different extruders that pass through a single die with multiple orifices that form the exudates into a single merged film/sheet consisting of individual welded layers.[2]

Colorants – Pigments or dyes used to impart color to a polymer. Pigments can be organic or inorganic. Dyes can be synthetic or derived from natural plants. Some compounds, Flexible vinyls, in particular, cannot use dyes as they will be absorbed by the plasticizers and a substantial amount will disappear from the surface.

Combining – The lamination of additional layer(s) on the back of a coated fabric. Most common is a urethane foam with or without additional backing. It is used to provide bulk and improve the cushioning effect of the coated fabric in a seating construction

Composite – A construction consisting of at least one polymer layer laminated to a substrate.

Compound – An intimate admixture of (a) polymer(s) with all the materials necessary for the finished product.[1]

Compounding – The process of preparing and mixing a compound.

Conditioning – Placing a material into a set of standard environmental or stress conditions prior to testing the product.[2]

Deboss – To depress below a surface using a tool to impart a Design, Logo, or Lettering on an expanded vinyl or other thermoplastic.

Delamination – The separation of the layers of material in a laminate.[1]

Density – Mass per unit volume.

Digital Printing – A method of printing a multicolored pattern from a digital image to the surface of a coated fabric. A versatile process that allows rapid changeover from one pattern to another. Avoids the considerable time, cost and complexity of printing multicolor patterns with the alternate method of using matched and registered gravure rolls. Major drawback is the very slow machine speed compared to gravure printing.

Drape – A term to describe the way a fabric, coated fabric and/or film falls while it hangs; the suppleness and ability of a fabric to form graceful configurations.

Embossing – The process of imparting a specific texture or grain to the surface of a coated fabric or film. This can be accomplished by pressing a cold engraved roll into the surface of a preheated coated fabric or film, by casting on a pre-embossed release paper, or by chemical means.

Extruder/Extrusion – A process in which heated plastic is forced through a shaping orifice (a die) in one continuously formed shape, as in film, or sheet.

Fabric – In the coated fabrics industry, this term refers to the textile material used to enhance the physicals of the composite formed by the coating/lamination of the plastic to the textile. The fabric usually is in a woven, knitted, or nonwoven construction. Woven Fabrics consist of materials formed on a loom with two separate yarns (warp and filling) that are at right angles to each other. The two yarns go over and under each other in a designated pattern. Knitted Fabrics are formed by a single or multiple yarns making interlocking loops. Non-Woven Fabrics are formed by laying a continuous web of random spaced fibers to form a uniform batting. The fibers are then bonded to form a fabric by chemical adhesion, thermal or mechanical processes.[2]

Fabricating – The conversion of a coated fabric into a useful product by cutting, trimming, sewing, forming, combining, heat sealing, debossing or other means.

Film – A thin sheet having a nominal thickness not greater than 0.25 mm (0.01 in.) and without any underlying support fabric.

Gravure Coating – A roll coating process by which an accurately measured coating thickness is applied to the surface of a coated fabric or film by an engraved cylinder.

Gravure Printing (Rotogravure) – A roll coating process by which a contrasting print pattern is applied to the surface of a coated fabric or film.

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Gravure (Anilox) Roll – A roll with an engraved pattern that is designed to hold and apply a measured amount of coating to the surface of a coated fabric or film. It can be designed to apply an overall clear or color coat, or to apply a contrasting print pattern.

HAP (Hazardous Air Pollutant) – A material identified by the EPA as hazardous when volatilized **into** the environment.

Hand – The tactile qualities of a fabric, coated fabric and/or film, e.g., softness, firmness, elasticity, fineness, resilience, and other qualities perceived by touch.[3]

Intumescence – The condition where a plastic material expands when exposed to very high heat and/or flames**,** aiding in reducing the flame spread of a material.

Knitted Fabrics – See "Fabric."

Lacquer – A solution of a resin(s) in a volatile solvent that when applied to the surface of a material forms an adherent film when the solvents have evaporated. The film has similar properties to the resins used to make the original lacquer.

Laminated Coated Fabrics – See "Coated Fabrics."

Laminate – Product(s) consisting of two or more layers which are bonded together by an adhesive, heat, and/or pressure.[2]

Laminating – The process of combining two or more natural or synthetic layers together.

Laminator – A machine used to combine multiple layers of polymer film or a polymeric film with a fabric. This process can use various adhesives or simply heat and pressure to combine the multiple layers.

Latex/Latices – A resinous polymer dispersion of material in a mainly aqueous vehicle.

Machine Direction and Cross Machine Direction – Machine Direction (MD) is parallel to the length of a roll of coated fabric or film (also the direction of travel through the manufacturing process). Cross Direction (CD) is perpendicular to the machine direction.

Matched and Registered Printing – A method of printing multicolored patterns using sets of gravure print rolls, each applying a different color and having precisely matched diameters, with each aligned in perfect registration so the colors are individually and precisely applied to their proper areas of the pattern. This process requires expensive tooling for each pattern and is economical only for long production runs and high-volume sales.

Metamerism – A term used to note the condition where a material matches the color of another item in one type of light and does not in another type of light. Example: two pieces match in sunlight (daylight) but one looks too red when looked at under incandescent light.[2]

Monomers – Small molecules that become the building blocks for high polymers.

Nonrigid Plastic – For purposes of general classification, a plastic that has a modulus of elasticity either in flexure or in tension of not over 70 Mpa (10,000 psi) at 23°C and 50% relative humidity when tested in accordance with ASTM Test Methods D790, D747, D638, or D882.[1]

Non-Woven Fabrics – See "Fabric."

Organosol – A suspension of resin and plasticizer mixture with a volatile organic liquid (at >5% level). Used mainly to lower viscosity of liquid material.[2]

Pigments – Colorants that are insoluble in the medium in which they are used. They can be Organic (containing carbon in molecule), or Inorganic (containing no carbon, but usually contain a metal, such as iron in iron oxides), and can be derived from natural or synthetic sources.[2]

Plastic – A material of one or several organic polymers of high molecular weight that is solid in its finished application. It should flow in some state of its manufacturing operation. This definition excludes certain materials that meet some or all of the criteria such as rubber, paint, adhesives, etc.

Plasticizer – A substance incorporated in a material to increase its workability, flexibility, or distensibility.[1]

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Plastisol – A liquid suspension of a plasticized vinyl homopolymer or copolymer compound. Highly stable at room temperature, it will form a gel and then fuse or cure at higher temperatures to form a flexible solid material. Plastisols are used in cast (transfer) coating, the most common method of making expanded vinyl coated fabrics.

Polymer – A large (high molecular weight) molecule built up by the repetitive addition of small simple chemical units (monomers) into a long chain.

Poly (Vinyl Chloride) – A polymer prepared by the polymerization of vinyl chloride as the sole monomer.[1]

Polyurethane – A large and versatile family of polymers based on isocyanate chemistry. Thermoplastic urethanes are routinely used in coated fabrics, while crosslinked (thermoset) urethanes can be found in topcoat formulations and in urethane foam cushioning.

Primer – A coating applied to the surface of a film to improve the receptivity of the surface for further coating application or improve bonds to an adhesive.

Recycled Plastic – Those plastic composed of, or containing, post-consumer and/or recovered material that may or may not have been subject to additional processing steps of the types used to make products such as recycled-regrind or reprocessed or reconstituted plastics.

Rotogravure – See "Gravure Printing."

Sheeting – A continuous form of unsupported plastic material, thicker than 0.25mm (0.01 inch), with the thickness being very small in proportion to its length and width. Sheeting is usually wound on a core but is often cut into sheets.

Silicones – A unique class of polymers with backbones based on silicon rather than carbon.

Skin Layer – The solid surface layer over the foam layer of an expanded vinyl coated fabric.

Spanishing – A process where ink is applied to the total surface of an embossed (textured) coated fabric or film and is then wiped off with a doctor blade, leaving ink only in the valleys of the embossing pattern.

Stabilizer – Additive being used in polymers to prevent degradation during processing and product life against heat, mechanical and ultraviolet stress.

Substrate – Unexposed layer or layers in a composite used to impart physical properties rather than appearance.

Supported Coated Fabric – A polymeric film laminated to a fabric for support and strength.

Surface Coating (Topcoat, Blotchcoat, or Print Coat) – A surface treatment applied to a polymer film by gravure (anilox) roll, spray, or other means to impart specific properties, or to change the color, or to print a pattern.

Surface Tension – A measure of the surface energy of a film or liquid. For liquid, the surface tensions are those forces which hold the liquid together as a drop and prevent it from wetting a surface.

Thermoplastics – Resins or plastic compounds that can be softened by heating and reharden at cooler temperatures.[2]

Thermoplastic Elastomers (TPE) – Blends of plastic and rubber-like materials that can be processed into film on conventional plastics equipment such as **calenders** and extruders.

Thermoplastic Olefins (TPO) – A type of TPE. Blends of olefins (polyethylene, polypropylene, etc.) with rubberlike materials.

Thermoplastic Urethanes (TPU) – A blend of urethanes that produces hard and soft segments within the polymer, giving it both plastic and rubber-like properties.

Thermosets – Resins or plastic compounds that once they have been cured (by heat, catalyst, or some chemical means) will not resoften when heated. Rather, they will decompose at high temperatures. Note: some thermoplastic materials can be made thermoset by cross linking.

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Top Coat – A term used to signify the coating applied to the surface of a coated fabric or film. Generally, it is clear or tinted and provides specific properties such as wear resistance.

Transfer Coating – A process of making coated fabrics. Plastisol coatings are applied directly to a treated release paper or continuous belt. After one or several layers are applied and partially cured, a thin layer of adhesive plastisol may be applied and the textile substrate is laid onto the material. The final curing process is completed. Then, the coated material is stripped from the treated paper. The paper can either be flat or have an embossed grain. It can normally be reused several times.[2]

UEV – An unsupported expanded vinyl (UEV).

Vacuum Formable Coated Fabrics – Vinyl coated fabrics in which the fabric is a four way stretch knit. They can be heated and drawn into a cold mold by vacuum (Female forming) imparting both the texture and three dimensional attributes of the mold, or by stretching over a cold tool (Male forming) and pulled tightly to it with vacuum to provide the three dimensional form of that tool. The cavities formed by this process are usually filled with a urethane foam for seating and other applications.

Vacuum Formable Unsupported Vinyl – Made without fabric, but the process is identical to the method above.

Vinyl Chloride Plastics – Plastics based on polymers of vinyl chloride or copolymers of vinyl chloride with other monomers, the vinyl chloride being in greatest amount by mass.[1]

VOC – Volatile organic compounds (solvents) that can flash off from a coating when it dries.

Waterborne Coating or Ink – A coating or ink containing solids that is dispersed or dissolved in a vehicle that is primarily water.

Whitening – Marking of the surface of a film, coated fabric, or composite when it is either bent or flexed.

Woven Fabrics – See "Fabric."

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[1] ASTM D883 - Standard Terminology Related to Plastics

[2] Whittington's Dictionary of Plastics

[3] Manmade Fiber and Textile Dictionary, Celanese Corporation

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