



# SPFA-119

## Glossary of Terms

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## ABOUT SPRAY POLYURETHANE FOAM ALLIANCE (SPFA)

Founded in 1987, the Spray Polyurethane Foam Alliance (SPFA) is the voice, and educational and technical resource, for the spray polyurethane foam industry. A 501(c)6 trade association, the alliance is composed of contractors, manufacturers, and distributors of polyurethane foam, related equipment, and protective coatings; and who provide inspections, surface preparations, and other services. The organization supports the best practices and the growth of the industry through a number of core initiatives, which include educational programs and events, the SPFA Professional Installer Certification Program, technical literature and guidelines, legislative advocacy, research, and networking opportunities. For more information, please use the contact information and links provided in this document.

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## DOCUMENT HISTORY

Date	Sections Modified	Description of Changes
2010		
August 2015	All	Administrative changes
May 2016	LIFT and PASS Definition	Minor modifications to improve clarity; diagram added.
July 2016	Definitions for thermal and ignition barriers	Updated definitions concurrent with July 2016 changes to SPFA-126

	and corresponding alternative assemblies.	
January 2021	Front Cover and Header	New SPFA Logo

## TECHNICAL OVERSIGHT COMMITTEE

### Mission Statement

The mission of the Technical Committee is to provide a wide range of technical service to the SPF (spray polyurethane foam) industry such as, but not limited to:

- (1) Review existing documents and serve as a clearing house to ensure the “Continuity of Value” of technical information published by SPFA and others concerning the products and services to the SPF industry;
- (2) Review, research, develop, and issue documents concerning new products, systems and services; and
- (3) To identify, explore, develop, and communicate an understanding of technical issues facing to the SPF industry.

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## A

**A-SIDE:** (A-Component) One component of a two-component system. For polyurethane foam and coatings, the ISOCYANATE component. (See ISOCYANATE.)

**ABAA:** See AIR BARRIER ASSOCIATION OF AMERICA.

**ABSOLUTE HUMIDITY:** The actual concentration of water vapor in air. May be expressed in units of kPa, grains of moisture per pound of dry air, pounds of moisture per pound of dry air, or as a partial pressure as inches of mercury (in. Hg).

**AC-377 / ACCEPTANCE CRITERIA 377:** The standard to which a specific formulation of spray polyurethane foam (SPF) is evaluated by the International Code Council Evaluation Service (ICC-ES) in order to issue an Evaluation Report which describes the foam’s compliance with building code requirements.

**ACCELERATOR:** A chemical additive to coating or polyurethane foam systems used in relatively small amounts to increase the speed of the reaction or to decrease the time required to cure or dry.

**ACRYLIC COATING:** A coating system based on an acrylic resin. Generally a “water-based” coating system that cures by coalescence and air-drying.

**ACRYLICS:** Resins resulting from the polymerization of derivatives of acrylic acids, including esters of acrylic acid, methacrylic acid, acrylonitrile, and their copolymers. They can be carried in a water

or solvent solution, and they are film-forming materials.

**ADHESION:** The degree of attachment or bonding of one substance to another. The degree of attachment or bonding between applications of the same substance. (For comparison, see also COHESION.)

**AEROSOL:** A suspension of fine solid particles or liquid droplets in a gas. In high-pressure foam and coating applications, liquid SPF chemicals and coating materials are formed into an aerosol in the spray gun by expulsion through a nozzle. (See ATOMIZATION.)

**AGGREGATE:** Any mineral surfacing material. May include crushed gravel, river-washed gravel, roofing granules, etc.

**AGING:** The effect on materials that are exposed to an environment for an interval of time.

**AGRICULTURAL CONTENT:** See BIO-CONTENT.

**AIR BARRIER:** A material that is applied in conjunction with a building component (such as a wall, ceiling, or sill plate) to prevent the movement of air through that component.

**AIR BARRIER ASSOCIATION OF AMERICA (ABAA):** ABAA is an organization that promotes the use of air barriers; offers technical specifications to designers; and offers on-site inspections. It develops standards of proficiency in the industry through the ABAA On-Site Quality Assurance Program. ABAA offers training to installers, estimators, managers, and administrators on the contractor side, as well as AIA accredited courses for design professionals. Some types of SPF are recognized as an air-barrier material via product testing and certified contractors.

**AIR BARRIER SYSTEM:** The assembly of components used in building construction to create a plane of air tightness throughout the building envelope and to control air leakage.

**AIR EXFILTRATION:** Air passing from the conditioned interior of a building to the exterior.

**AIR-FILTER RESPIRATOR:** See RESPIRATOR.

**AIR INFILTRATION:** Exterior air passing into the conditioned area of a building.

**AIR IMPERMEABLE:** An insulation having an air permanence at a specific thickness that is equal to or less than  $0.02 \text{ L/s}\cdot\text{m}^2$  at 75 Pa pressure differential ( $0.004 \text{ ft}^3/\text{ft}^2\cdot\text{min}$  at  $1.57 \text{ lb}/\text{ft}^2$ ) tested in accordance with ASTM E 2178 or E 283.

**AIR LEAKAGE:** The uncontrolled flow of conditioned air through gaps, cracks, or holes in the building envelope or its components.

**AIR PERMEABLE:** An insulation having an AIR PERMANENCE at a specific thickness that is greater than  $0.02 \text{ L/s}\cdot\text{m}^2$  at 75 Pa pressure differential ( $0.004 \text{ ft}^3/\text{ft}^2\cdot\text{min}$  at  $1.57 \text{ lb}/\text{ft}^2$ ) tested in accordance with ASTM E 2178 or E 283. (See also PERMEABILITY, AIR and PERMEANCE, AIR.)

**AIR-PURIFYING RESPIRATOR (APR):** Respirators that consist of a facemask and an air-purifying device, which is either attached directly to the mask or carried on a body harness and connected to the mask via a breathing hose. APRs selectively remove specific airborne contaminants (particulate, vapors, fumes, and gases) from ambient air by filtration, adsorption, or chemical reactions. Filtering cartridges are removed and replaced at the end of their useful service life. APRs can be either of the full face or half mask varieties. (See RESPIRATOR.)

**AIR-SUPPLIED RESPIRATOR:** See RESPIRATOR.

**ALIPHATIC (POLYURETHANE):** A type of polyurethane that does not contain carbon atoms arranged in aromatic (benzene) ring structures. As compared to AROMATIC (POLYURETHANE), coatings based on aliphatic polyurethane have superior resistance to UV weathering, and better color and gloss retention. (See *also* AROMATIC [POLYURETHANE].)

**ALLIGATORING:** Pattern cracking of a coating or mastic, so called because of its resemblance to the pattern of an alligator skin. (See CHECKING.)

**ALTERNATIVE IGNITION BARRIER ASSEMBLY:** An assembly consisting of either the exposed SPF or the SPF with a fire-protective product that complies with the conditions of acceptance of Appendix X or for attic floors, complies with ASTM E970.

**ALTERNATIVE THERMAL BARRIER ASSEMBLY:** An assembly consisting of either the exposed SPF or the SPF with a fire-protective product that complies with the Special Approval section of the IBC or the Specific Approval section of the IRC. Referenced test procedures include NFPA 286, UL 1715, FM 4880 or UL 1040.

**AMBIENT TEMPERATURE:** The surrounding air temperature.

**AMINE CATALYST:** A broad range of nitrogen-based compounds that are used to promote blowing and curing reactions in polyurethanes. An amine catalyst is typically contained in the B-side, or resin, of the two-component polyurethane system.

**APPLICATION RATE:** The quantity (mass, volume, or thickness) of material applied per unit area.

**APR:** See AIR-PURIFYING RESPIRATOR.

**AREA DIVIDER:** A raised, flashed assembly (typically a single-wood or double-wood member attached to a wood base plate) that is anchored to the roof deck. It is used to relieve thermal stresses in a roof system where an expansion joint is not required, or to separate large roof areas (sometimes between expansion joints). May be used to facilitate the installation of tapered insulation.

**AROMATIC (POLYURETHANE):** A type of polyurethane that contains some carbon atoms arranged in aromatic (benzene) ring structures. As compared to ALIPHATIC (POLYURETHANE), coatings based on aromatic polyurethane are usually tougher, but have less resistance to UV

weathering, and less color and gloss retention. (See *also* ALIPHATIC [POLYURETHANE].)

**AROMATIC SOLVENTS:** Hydrocarbon solvents composed of organic compounds, which contain an unsaturated ring of carbon atoms, including benzene, xylene, toluene, and their derivatives.

**ASPHALT:** A dark brown to black bituminous substance, solid or semi-solid in consistency, obtained from petroleum refining. It consists mainly of hydrocarbons. Asphalt products are available for hot or cold application. Asphalt will dissolve in mineral spirits.

**ASTM INTERNATIONAL:** Formerly known as the American Society for Testing and Materials. A test standards development agency.

**ATOMIZATION:** The breakup of liquid or fluid into spray when forced through a small opening or orifice at high pressure.

**ATTIC – VENTED:** The unfinished space between the ceiling assembly of the top story and the roof assembly that has openings to the outside adequate to promote natural or mechanical air exchange.

**ATTIC – UNVENTED:** The unfinished space between the ceiling assembly of the top story and the roof assembly that has no openings to the outside adequate to promote natural or mechanical air exchange.

## B

**B-SIDE:** (B-component) One component of a two-component system. For polyurethane foam and coatings, the RESIN component. (See RESIN.)

**BACK ROLLING:** Rolling a wet coating behind a spray or roller application to ensure better coverage on rough surfaces.

**BASE COAT:** The first coat of a multi-coat system. This should be applied the same day as the SPF.

**BIO-CONTENT:** Materials that are natural, non-petroleum based, and have harvest cycles of 10 years or less per LEED standards. Bio-content is determined by ASTM D 6866, whereby the percentage of new carbon atoms is measured in relationship to the percentage of old carbon atoms. All bio-content claims shall be based on the finished foam product and not the individual raw materials. (See *also* LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN [LEED].)

**BIRDBATH:** Random, inconsequential amounts of residual water on a roof membrane.

**BITUMEN:** A class of amorphous, dark brown to black (solid, semi-solid, or viscous), high molecular weight hydrocarbons derived from petroleum refining or coal reduction. (See ASPHALT; COAL TAR.)

**BLEEDING:** (1) The diffusion of coloring matter through a coating from its substrate (such as bleeding of asphalt mastic through coating). (2) The absorption of oil or vehicle from a compound into an adjacent porous surface.

**BLISTER:** An uplifting of coating or polyurethane foam caused by an enclosed pocket of gas or liquid entrapped between coating passes, foam and coating, foam and substrate, or within the foam itself. Caused by the DELAMINATION of one or two components in an insulation or roofing system. (See DELAMINATION.)

**BLOWHOLE:** A hole in the polyurethane foam surface and/or coating surface about 1 mm in diameter (the size of a ballpoint pen tip). (See also PINHOLE.)

**BLOWING AGENT:** A chemical additive formulated into either the A-side or B-side of the system, which creates bubbles that are trapped in the polyurethane as it solidifies to form foam cells. The gas produced from the blowing agent contributes to more than 97% of the volume of polyurethane foam. The blowing agent can be physical or reactive in nature. The physical blowing agents (e.g., liquid fluorocarbon) vaporize with the heat of the polyurethane reaction. The reactive blowing agents (e.g., water) react with one of the other chemicals in the formulation to produce a gas during the reaction (e.g., water and isocyanate yields carbon dioxide).

**BOARD-FOOT:** A volume measurement of materials such as SPF insulation, board-stock insulation, and lumber. One board-foot equals a volume of 12 in. by 12 in. by 1 in. Abbreviated bd•ft (1 bd•ft = 1/12 cubic ft = 0.00236 m<sup>3</sup>).

**BOCA:** Acronym for Building Officials Code Administrators International. BOCA, once one of three model code agencies in the United States, developed the National Building Code which had been commonly adopted in the Eastern and Midwestern U.S. BOCA has been absorbed into the ICC. (See also INTERNATIONAL CODE COUNCIL.)

**BOND, CHEMICAL:** Adhesion between surfaces, usually of similar materials, resulting from a chemical reaction or cross-linking of polymer chains.

**BOND, MECHANICAL:** Adhesion between surfaces resulting from interfacial forces or a physical interlocking.

**BUILDING CODE:** A set of rules that establish the minimum acceptable levels of safety for constructed structures. Building codes also provide minimum standards for the energy consumption of structures. In the United States, model codes are developed and published by the INTERNATIONAL CODE COUNCIL (ICC) and the NATIONAL FIRE PROTECTION ASSOCIATION (NFPA). Model codes acquire legal standing when adopted by state or local authorities. (See INTERNATIONAL CODE COUNCIL; NATIONAL FIRE PROTECTION ASSOCIATION [NFPA].)

**BUILDING ENVELOPE:** The exterior shell of the building, which provides structural integrity and control of heat, air, and moisture.

**BUILDING SCIENCE:** Involves the application of basic science knowledge and analysis procedures



to the design of buildings. There is special knowledge and experience required, and such expertise is also beneficial in determining how to correct problems in existing buildings and to explain what went wrong in the event of problems.

**BUILT-UP ROOF (BUR):** A roofing membrane consisting of alternating applications of bituminous impregnated felts (or fabrics) and hot (or cold) mopped bitumen. The membrane is generally surfaced with aggregate.

**BUTYL COATING:** An elastomeric coating system derived from polymerized isobutylene. Butyl coatings are characterized by low water vapor permeability.

## C

**CALORIMETER:** An apparatus for measuring quantities of heat developed by combustion.

**CANADIAN URETHANE FOAM CONTRACTORS ASSOCIATION:** Also known as CUFCA, this is a national contractor organization promoting education, research, and certification of SPF contractors and applicators throughout Canada.

**CANT:** A beveling of polyurethane foam at a right-angle joint for strength and water runoff.

**CANT STRIP:** A beveled strip used under flashings to modify the angle at the point where the roofing or waterproofing membrane meets any vertical element.

**CAP FLASHING:** Usually composed of metal, used to cover or shield the upper edges of the membrane base flashing, wall flashing, or primary flashing.

**CAPACITANCE METER:** A device used to detect moisture or wet materials within a roof system by measuring the ratio of the change to the potential difference between two conducting elements separated by a nonconductor.

**CAPILLARY ACTION, CAPILLARITY:** The movement of liquid in the interstices of insulation or other porous material as a result of surface tension.

**CATALYST:** An ingredient in a coating or polyurethane foam system that initiates a chemical reaction or increases the rate of a chemical reaction.

**CATHEDRAL CEILING:** A high, open, usually sloped or pointed ceiling. Unlike a standard ceiling, there is minimal airspace between the inside surface of the roof sheathing and the interior cladding or drywall.

**CAULK:** A flexible waterproofing material used to seal cracks, seams, or small breaks in a waterproofing or an air barrier system. Usually supplied in tubes and applied with a caulking gun. (See SEALANT.)

**CAVITATION:** The vaporization of a liquid under the suction force of a pump. Usually due to inadequate flow to a pump, the vaporization can create voids within the pump or the pump supply line. In polyurethane foam spray pumps, cavitation will result in off-ratio foam. (*See also OFF-RATIO FOAM*).

**CAVITY WALL:** An exterior wall, usually of masonry, consisting of an outer and inner wythe separated by a continuous air space.

**ccSPF:** Closed cell SPF. (*See MEDIUM-DENSITY SPF.*)

**CELLULAR:** Describes a composition of plastic or rubber with relative density decreased by the presence of cells dispersed throughout its mass. In closed cell materials, the cells are predominately separate from each other. In open cell materials, the cells are predominately interconnected.

**CENTIPOISE (cps):** A unit of measure of absolute viscosity. (Note: The viscosity of water is 1 cps at 20°C [68°F]. The lower the number, the less the viscosity.)

**CFC:** Chlorofluorocarbon. A physical blowing agent containing at least one carbon, one fluorine, and one chlorine atom in its structure (for example, CFC-11). CFC use was phased out in the United States as a spray foam blowing agent between 1993 and 1996.

**CHALKING:** The formation of a powdery substance due to weathering on a coated surface.

**CHECKING:** A defect in a coated surface characterized by the appearance of fine fissures in all directions. Designated as “surface checking” if superficial or “through checking” if extending deeply into the coating or to an adjoining surface.

**CHEMICAL BOND:** *See BOND, CHEMICAL.*

**CHEMICAL RESISTANCE:** The ability to withstand contact with specified chemicals without a significant change in properties.

**CHLORINATED RUBBER:** Resin formed by the reaction of rubber and chlorine to form a coating (i.e., primer or Hypalon) or single ply membrane.

**CLOSED CELL SPF:** *See MEDIUM-DENSITY SPF.*

**COAL TAR:** A dark brown to black hydrocarbon obtained from the destructive distillation of coal. Used in built-up roofs or in below-grade construction as a waterproofing agent. COAL TAR when mixed with mineral spirits will produce a yellow-green to amber color, but will not dissolve.

**COALESCENCE:** The formation of a film of resinous or polymeric material when water evaporates from an emulsion or latex system, permitting contact and fusion of adjacent latex particles. Also the action of the joining of particles into a film as the volatile evaporates.

**COARSE ORANGE PEEL SURFACE TEXTURE:** A surface showing a texture where nodules and

valleys are approximately the same size and shape. This surface is acceptable for receiving a protective coating because of the roundness of the nodules and valleys. This surface requires at least 25% additional material to the theoretical amount. (See SPFA-145, “Surface Texture of Spray Polyurethane Foam.”)

**COATING:** A layer of material applied over a surface for protection or decoration. Coatings for polyurethane foam are liquids, semi-liquids, or mastics; are spray, roller, or brush applied; and are ELASTOMERIC. (See ELASTOMERIC.)

**COBWEBBING:** Production of fine filaments instead of the normal atomized particles when some coatings are sprayed.

**COEFFICIENT OF THERMAL EXPANSION:** A mathematical formulation used to predict the change in dimension (typically length) of a material as a function of temperature change.

**COHESION:** The degree of internal bonding of one substance to itself. (See ADHESION.)

**COLD-APPLIED:** Capable of being applied without heating as contrasted to hot-applied. Cold-applied products are furnished in a liquid state, whereas hot-applied products are furnished as solids that must be heated to liquefy them.

**COLLECTOR BOX:** See CONDUCTOR HEAD.

**COLLOIDAL DISPERSION:** A mixture wherein a finely divided material is uniformly distributed within a liquid. LATEX emulsion is a colloidal dispersion of resin in water. (See LATEX.)

**COLOR STABILITY:** The ability to retain the original color without significant change over time.

**COMBUSTIBLE:** Capable of burning.

**COMPARATOR:** See OPTICAL COMPARATOR.

**COMPATIBLE MATERIALS:** Two or more substances that can be mixed, blended, or attached without separating, reacting, or affecting the materials adversely.

**COMPRESSIVE STRENGTH:** The stress or force applied parallel to the direction of the polyurethane foam rise at 10% deformation or at yield point.

**CONDENSATE:** The liquid resulting from the condensation of a gas or vapor. (See also CONDENSATION.)

**CONDENSATION:** The action of a vapor converting into a liquid.

**CONDITIONED CRAWLSPACE:** See CRAWLSPACE, UNVENTED.

**CONDITIONING:** The exposure of a material to the influence of a prescribed atmosphere and/or temperature for a stipulated period of time or until a stipulated relation is reached between the

material and atmosphere.

**CONDUCTOR HEAD:** A transition component between a through-wall scupper and downspout to collect and direct runoff water.

**CONTINUOUS INSULATION (CI):** Insulation that is continuous across all structural members without any thermal bridges other than fasteners and service openings. It is installed on the interior or exterior or is integral to any opaque surface of the building envelope.

**CONTROL JOINT:** *See* AREA DIVIDER.

**COOL ROOF:** (1) A roof system that tends to reflect solar energy away from the roof surface and/or emit non-reflected solar energy away from the roof surface such that less solar energy is absorbed into the building, thus reducing cooling loads. Reflective cool roofs are generally white or other light color. Cool roofs may be rated by the Cool Roof Rating Council, EnergyStar, or other organizations. (2) Any roof system that exhibits energy load performance similar to a cool roof.

**COPING:** The covering at the top of a wall or parapet designed to shed water.

**COPOLYMER:** A polymer consisting of molecules containing large numbers of units of two or more chemically different types in irregular sequence.

**CORE SAMPLE:** The actual material of a cross-section of the roofing material, insulation, etc., showing the various layers.

**COUNTERFLASHING:** Formed metal or elastomeric sheeting secured on or into a wall, curb, pipe, roof-top unit, or other surface to cover and protect the upper edge of a base flashing and its associated fasteners.

**COVERAGE:** The unit quantity of material necessary to apply to achieve a desired thickness. Usually expressed in square meter per liter (square feet per gallon) or liters per square meter (gallons per hundred square feet).

**CPI:** Center for the Polyurethanes Industry, a division of the American Chemistry Council, whose members include producers or distributors of the chemicals and the equipment used to make polyurethane products.

**CPVC:** Chlorinated polyvinylchloride. A thermoplastic resin used to form sprinkler and high-temperature water piping and fittings.

**CRAWLSPACE, VENTED:** A low space beneath the floor of a building, giving workers access for the service of utilities, which is ventilated to the exterior of the building envelope. Insulation is typically installed in the crawlspace overhead (beneath the floor of the building).

**CRAWLSPACE, UNVENTED:** A low space beneath the floor of a building, giving workers access for the service of utilities, which is not ventilated to the exterior of the building envelope. Insulation

is typically installed in the crawlspace walls. Also known as “conditioned crawlspace.”

**CRAZING, CRAZE CRACKS:** Fine, random cracks forming a network on the surface of a coating or film.

**CREAM TIME:** After mixing two SPF-forming components, cream time occurs when the mixture changes from a clear dark-colored liquid to an opaque light-colored liquid. The cream time represents the onset of the rise of the foam.

**CREEP:** (1) The permanent deformation of a material caused by slow movement over time resulting from thermal or load stresses. (2) Lateral movement of expanding foam.

**CRICKET:** A relatively small, elevated area designed to facilitate the flow of water around an obstruction on a roof, such as a chimney or skylight.

**CROSS HATCH:** An application method for liquid applied materials whereby successive layers or passes are applied at 90-degree angles to the previous application.

**CROSSOVER:** An undesirable mixing of ISOCYANATE and RESIN components as a result of unbalanced pressures at the spray gun. May result in an equipment blockage.

**CUFCA:** See CANADIAN URETHANE FOAM CONTRACTORS ASSOCIATION.

**CURE:** The completeness of the chemical reaction. At substantial completion, the foam should have near the maximum physical properties attainable for the particular formulation used. Cure is not directly related to levels of product emissions during or after SPF application.

**CURE TIME:** The time required for a foam to achieve the substantial completion of reaction.

**CURING AGENT:** An agent in a coating or adhesive that increases the rate of cure.

**CURTAIN WALL:** A lightweight exterior wall system supporting no more than its own weight, the roof and floors being carried by an independent structural framework.

## D

**DEAD LEVEL:** Absolutely horizontal or zero slope.

**DEAD LOADS:** The weight imposed on a structural roofing system, including the waterproofing system, roof-mounted equipment, roof structural members, and anything hung from the roof structure.

**DECK:** The structural surface to which a roofing or waterproofing system is applied. Spray polyurethane foam may be applied to decks on the exterior side as an insulated roofing system or to the interior side as an insulation system.

**DEFLECTION:** The deviation of a structural element from its original shape or plane due to

physical loading, temperature gradients, or movement of its support.

**DEGRADATION:** The deterioration of a substance caused by contact with its environment.

**DELAMINATION:** The separation of layers within a material or materials. May result in BLISTER formation. (See BLISTER.)

**DESICCANT:** A substance that attracts water molecules from the surrounding environment through absorption. Typically used to dry compressed air or to dry makeup air entering chemical storage containers.

**DEW POINT:** The temperature at which a vapor begins to condense.

**DIFFUSION:** The process in which there is movement of a substance from an area of high concentration of that substance to an area of lower concentration, typically through or across a membrane (for example, water vapor diffusing from a humid bathroom into the bathroom walls, resulting in moisture in the wall assembly).

**DIISOCYANATE:** An organic chemical compound having two reactive isocyanate (-N=C=O) groups used in the production of polyurethane foams and polyurethane coatings.

**DIMENSIONAL STABILITY:** The ability of a material to retain its original size and shape. For polyurethane foam, dimensional stability is determined over time under conditions of controlled temperature and humidity. Measured as a percentage of the original dimension.

**DISCOLORATION:** Any change from the initial color. (See *also* COLOR STABILITY.)

**DRAFTSTOP:** A material, device, or construction installed to restrict the movement of air and smoke within the open spaces of concealed areas of building components, such as crawlspaces, floor/ceiling assemblies, roof/ceiling assemblies, and attics.

**DRAINAGE:** See POSITIVE DRAINAGE.

**DRIP EDGE:** A projecting piece of material shaped to throw off water and prevent water from running down the face of the wall or another surface.

**DRY-BULB TEMPERATURE (DBT):** The temperature of air as measured by an ordinary thermometer. (See *also* AMBIENT TEMPERATURE; WET BULB TEMPERATURE.)

**DRYING TIME:** The time required for the loss of volatile components so that the material will become tack-free and no longer be adversely affected by weather conditions, such as dew, rain, or freezing. Also, contrasted with CURE TIME. (See *also* CURE TIME.)

## E

**ELASTOMER:** A material that at room temperature is capable of being stretched repeatedly to at least twice its original length (100% ELONGATION) and, upon release of stress, will return to its original dimensions. (*See also* ELONGATION.)

**ELASTOMERIC:** The elastic, rubber-like properties of a material that will stretch when pulled, and will return relatively quickly to its original shape when released.

**ELASTOMERIC COATING:** A coating system that when fully cured is capable of being stretched to at least twice its original length (100% ELONGATION), and recovering to its original dimensions. (*See also* ELONGATION)

**ELONGATED CELLS:** Excessively large cells in foam or coating, generally caused by off-ratio materials, moisture contamination, or excessive heat.

**ELONGATION:** The increase in the length of a specimen at the instant that rupture occurs (expressed as a percentage of the original length).

**EMBODIED ENERGY:** The quantity of energy required to manufacture and supply to the point of use of a product, material, or service.

**EMISSIVITY:** The ability of a material to radiate or absorb radiant energy. Emissivity is usually expressed as a number (0–1) or a percentage (0%–100%) which is determined at infrared wavelengths. The higher the number, the greater the ability of the material to absorb and radiate infrared radiation.

**EMULSION:** A COLLOIDAL DISPERSION of one liquid in another. (*See* LATEX; COLLOIDAL DISPERSION.)

**EPOXY:** A class of synthetic, thermosetting resins that produce tough, hard, chemical-resistant coatings and adhesives.

**ESR:** *See* EVALUATION SERVICE REPORT.

**EVALUATION SERVICE REPORT:** An evaluation report presenting the findings of ICC-ES (International Code Council Evaluation Service) on the compliance with building code requirements of the subject of the report—a particular building product, component, method, or material.

**EXOTHERMIC REACTION:** A chemical reaction that produces heat. SPF and certain coatings are the product of exothermic reactions.

**EXPANSION JOINT:** A joint designed to accommodate movement in the structure or components of the system due to thermal or stress-load variation.

**F**

**FAST-SET:** A term applied to a coating to indicate a faster curing time versus a standard version of the generic coating. In polyurethane and polyurea coatings, this is generally indicative of cure times in the range of a few seconds to a few minutes, or coatings that must be sprayed with plural component equipment. In acrylic coatings, this is generally indicative of a 1–3 hour cure schedule versus a 2–5 hour cure schedule at 75°F.

**FEATHERED EDGE:** The thin tapered outside edge of a polyurethane foam pass.

**FELTS:** A flexible sheet manufactured by the interlocking of fibers through a combination of mechanical work, moisture, and heat. Roofing felts may be manufactured principally from wood pulp and vegetable fibers (organic felts), asbestos fibers (asbestos felts), glass fibers (fiberglass felts or ply sheet), or polyester fibers.

**FERROUS METAL:** An iron compound (i.e., steel, cast iron, or galvanized steel). As a rule of thumb, most ferrous metals are magnetic.

**FILLER:** A relatively inert ingredient added to coating or polyurethane foam formulations to modify their physical characteristics.

**FILM THICKNESS:** The thickness of a membrane or coating. Wet-film thickness is the thickness of a coating as applied; dry-film thickness is the thickness after curing. Film thickness is usually expressed in mm or mils (thousandths of an inch).

**FIRE RESISTANCE:** The inherent capability of a building assembly or an element of construction to resist the passage of heat, smoke, and flame; and/or to maintain structural integrity for a specified time during a fire. Usually measured by ASTM E 119.

**FIREBLOCKING:** Building materials or constructions designed, approved, and installed to resist the free passage of flame to other areas of the building through concealed spaces.

**FIRESTOP:** A material, device, or construction, installed to resist for a prescribed time period, the passage of flame and heat through openings in a protective membrane in order to accommodate cables, cable trays, conduit, tubing, pipes, or similar items.

**FISHEYE:** A coating defect that manifests itself by the separation of the wet coating into a recognized pattern resembling small “dimples” or “fish eyes.”

**FISHMOUTH:** Also referred to as an “edge wrinkle.” A half-cylindrical or half-conical shaped opening or void in a lapped edge or seam, usually caused by wrinkling or shifting of ply sheets during installation. In shingles, a half-conical opening formed at a cut edge.

**FLAME RETARDANT:** A substance that is added to a coating or polyurethane foam formulation to reduce or retard its tendency to burn.



**FLAME SPREAD:** Per ASTM E 84, a measure of relative combustibility. The flame spread of a tested material is rated relative to fiber cement board (flame spread = 0) and red oak flooring (flame spread = 100).

**FLAMMABILITY:** Relative ability of a material to support combustion as expressed by its flash point.

**FLASH AND BATT:** See HYBRID INSULATION.

**FLASH COAT:** A thin initial pass of a spray-applied material.

**FLASH-IGNITION TEMPERATURE:** The lowest temperature of a material required to initiate combustion in the presence of a spark or flame.

**FLASHOVER:** (1) A fire condition wherein gasses are ignited at the ceiling level of a room. (2) One of several measurements that are used to determine the threshold at which a fire test is terminated. Flashover can be a visual observation of flames exiting the structure or a measured heat flux or temperature limit.

**FLASHPOINT:** The lowest temperature of a material at which it gives off vapors sufficient to form an ignitable mixture with air near its surface.

**FLASHING:** The portion of a roof system used to waterproof at terminations or vertical surfaces.

**FLUOROCARBONS:** A chemical that contains both a carbon and a fluorine atom in its structure. They are traditionally used as physical blowing agents for polyurethane foam products. There are three common classes of these materials used as blowing agents: CFC, HCFC, and HFC. (See also CFC; HCFC; HFC.)

**FLUTES:** The grooves in the lower section of metal decking that give it added strength.

**FM:** See FM GLOBAL.

**FM APPROVALS:** A division of FM Global (formerly Factory Mutual or FM) that certifies industrial and commercial products and services as meeting its established safety standards for insurance rating purposes, and which publishes such certifications in its Approval Guide.

**FM GLOBAL:** Formerly Factory Mutual or FM. A United States-based insurance company that specializes in loss prevention services. The company employs a business model that determines risk and premiums through engineering analysis as opposed to historically based calculations. (See also FM APPROVALS.)

**FMRC:** Factory Mutual Research Corporation. A part of FM.

**FOAM STOP:** The roof edge treatment upon which polyurethane foam is terminated.

**FREEZE-THAW CYCLE:** The freezing and subsequent thawing of material.

**FRIABILITY:** The tendency of a material or product to crumble or break into small pieces easily.

**FROTH PACK:** Pressurized containers of polyurethane foam components.

## G

**GLASS EYES, GLASS WINDOWS:** A thin, clear membrane that forms over elongated polyurethane foam cells. Glass eyes may break when coated, forming a PINHOLE. (*See also* PINHOLE.)

**GLOSS:** The shine, sheen, or luster of a dried film.

**GRANULE:** Size No. 11 ceramic aggregate embedded into wet coating over polyurethane foam for aesthetics, traction, and mechanical resistance.

**GRAVEL STOP:** The roof edge treatment designed to retain gravel.

## H

**HARDNESS:** Ability of a coating film, as distinct from its substrate, to resist cutting, indentation, or penetration by a hard object.

**HCFC:** Hydrochlorofluorocarbon. A physical blowing agent containing at least one carbon, one fluorine, and one chlorine atom in its structure (e.g., HCFC-141b). Effective January 1, 2005, the United States Environmental Protection Administration (EPA) issued a Use Ban Regulation on HCFC-141b blowing agent, meaning that SPF systems containing HCFC-141b could not be domestically produced or imported, under penalty of law, after this date. The regulation also required that any existing inventory of finished product containing HCFC-141b could not be applied after June 30, 2005.

**HEAT AGING:** Controlled exposure of materials to elevated temperatures for a period of time.

**HEAT FLUX:** The rate of heat transfer per unit area. Usually used to describe the rate of radiant heat transfer. Units are  $W/m^2$  (Btu/ft<sup>2</sup>•hr).

**HEAT SINK:** A cold substrate that absorbs the SPF exothermic heat, slowing down the reaction and/or rise of the polyurethane foam or coating.

**HERS:** *See* HOME ENERGY RATING SYSTEM.

**HFC:** Hydrofluorocarbon. A physical blowing agent containing at least one carbon and one fluorine atom in its structure (for example, HFC-245fa). HFCs have no ozone depletion potential.

**HIDING POWER:** The ability of a coating to hide or obscure a surface to which it has been uniformly applied.

**HIGH PRESSURE SPF:** See SPF, HIGH PRESSURE.

**HOLIDAYS:** Application defects whereby small areas are left uncoated.

**HOME ENERGY RATING SYSTEM (HERS):** HERS is a rating system for residential energy efficiency developed by EnergyStar and RESNET (Residential Energy Services Network). Through a comprehensive design review and analysis, it incorporates HVAC, building enclosure; and orientation, as well as appliance and lighting selection. A HERS score of 0 indicates a net zero-energy home, while a HERS score of 100 represents the energy consumption of home built to the 2003 IECC model energy code. A maximum HERS score of 70 is required for a home to be EnergyStar compliant.

**HYBRID INSULATION:** A combination of insulation types typically arranged so the SPF insulation acts as an air barrier and/or a vapor retarder, and the other insulation type contributes by adding R-VALUE. (See *also* R-VALUE.)

**HYDROPHILIC:** Also known as “water-loving.” Having an affinity or an attraction for water; having the ability of uniting with or dissolving in water.

**HYDROPHOBIC:** Also known as “water-fearing.” Having no affinity for water; not compatible with water.

**HYGROSCOPIC:** Attracting, absorbing, and retaining atmospheric moisture.

**HYGROSCOPICITY:** The capacity of a compound or substance to absorb water.

## I

**I-CODES®:** The set of model building codes promulgated by the International Code Council (ICC). The I-Codes include the International Residential Code (IRC), the International Building Code (IBC), the International Energy Conservation Code (IECC), the International Mechanical Code, and others. (See *also* INTERNATIONAL CODE COUNCIL.)

**IBC:** See INTERNATIONAL BUILDING CODE.

**ICAA:** Insulation Contractors Association of America.

**ICBO:** International Conference of Building Officials. ICBO, once one of three model code agencies in the United States, developed the Uniform Building Code (UBC), which had been commonly adopted in the Western United States. ICBO has been absorbed into the ICC. (See *also* INTERNATIONAL CODE COUNCIL; UBC.)

**ICC:** See INTERNATIONAL CODE COUNCIL.

**IECC:** See INTERNATIONAL ENERGY CONSERVATION CODE.

**IGNITION BARRIER:** A building code permitted protective covering applied over foam plastic insulations, including SPF, in attics and crawlspaces to increase the time it takes for the foam plastic to become involved in a fire. Ignition barriers do not provide as much fire protection as thermal barriers. The building code restricts the use of ignition barriers to attics and crawlspaces of limited access (check the local building code for specific requirements).

**IGNITION TEMPERATURE:** *See* FLASH-IGNITION TEMPERATURE.

**IMPACT RESISTANCE:** Ability to withstand mechanical or physical blows without the loss of protective properties. The impact resistance of the roofing assembly is a function of all its components and not only the membrane.

**IMPINGEMENT MIXING:** A process of mixing in which multiple liquid streams are forced toward one another at a high velocity, producing very thorough mixing in a short period of time.

**INFRA-RED THERMOGRAPHY:** Photography in the infra-red wave length wherein the temperature differences of objects and surfaces can be readily distinguished. Infra-red thermography is frequently used to (1) identify sources of heat loss or gain that affect building energy efficiency; (2) identify sections of building assemblies containing moisture; and (3) identify electrical or mechanical components that are overheating.

**INTERLAMINAR ADHESION:** Adhesion between polyurethane foam passes or coating passes. (*See also* COHESION.)

**INTERNATIONAL BUILDING CODE (IBC):** Revised every three years, one of the I-CODES® promulgated by the International Code Council (ICC) oriented toward general construction other than one- and two-family dwellings, which are covered under the International Residential Code (IRC). (*See also* INTERNATIONAL CODE COUNCIL; I-CODES; INTERNATIONAL RESIDENCE CODE.)

**INTERNATIONAL CODE COUNCIL (ICC):** The ICC formed in 1994 from the merger of BOCA, ICBO, and SBCCI to promulgate a common set of model building codes. Codes developed by the ICC are commonly referred to as the I-CODES®. (*See also* BOCA; ICBO; I-CODES; SBCCI.)

**INTERNATIONAL ENERGY CONSERVATION CODE (IECC):** A model building code promulgated by the ICC designed to set minimum standards of energy conservation for buildings. The IECC is one of the I-CODES® and is revised every three years. (*See* INTERNATIONAL CODE COUNCIL, I-CODES.)

**INTERNATIONAL RESIDENTIAL CODE (IRC):** A model building code promulgated by the ICC designed to set minimum standards of residential construction (one- and two-family dwellings). The IRC is one of the I-CODES® and is revised every three years. (*See also* INTERNATIONAL CODE COUNCIL; I-CODES.)

**INTUMESCENT COATING:** Coatings that are formulated to swell and char when exposed to heat. When applied to a combustible (or non-combustible) substrate, this “swollen char” is designed to insulate the substrate from the heat source, thus reducing the potential for fire and/or

increasing the time before the substrate becomes involved in a fire.

**IRC:** See INTERNATIONAL RESIDENTIAL CODE.

**ISO:** Vernacular for ISOCYANATE. (*See also* ISOCYANATE.)

**ISOCYANATE:** A highly reactive organic chemical containing one or more isocyanate (-N=C=O) groups. A basic component in polyurethane foam chemical systems and some polyurethane coating systems.

**ISOCYANURATE:** Also referred to as PIR, polyiso, or polyisocyanurate, it is essentially a modified polyurethane (PUR) foam. The proportion of methylene diphenyl diisocyanate (MDI) is higher than for PUR and instead of a polyether polyol resin, a polyester derived polyol is used in the reaction. Catalysts, blowing agents, and additives used in PIR foam formulations also differ from those used in PUR. Isocyanurates are generally manufactured in a factory into boardstock form, and are used in exterior roofing and sheathing applications. The thermal performance of isocyanurate or PIR boardstock foams is comparable to MEDIUM-DENSITY CLOSED CELL SPF. (*See also* MEDIUM-DENSITY SPF; CLOSED CELL SPF).

## J

[No Entries]

## K

**k-FACTOR:** Thermal conductivity for a unit thickness of material. Expressed as  $W/m^2 \cdot K$  ( $Btu \cdot in./hr \cdot ft^2 \cdot F$ ). R-VALUE is equal to the thickness of the material divided by the k-factor ( $R = x/k$  where  $x =$  thickness). (*See* R-VALUE.)

**KNIT LINE:** A high-density skin formed between one lift or pass of foam and another. Synonymous with LIFT LINE.

**KREBS UNITS (K.U.):** A measurement of viscosity for materials that have the property of changing resistance to flow when under shear. Such materials are called THIXOTROPIC. Measuring is accomplished with a Krebs/Stormer viscometer. (*See also* THIXOTROPIC.)

## L

**LAITANCE:** A layer of weak non-durable material containing cement and fines, brought by bleeding water to the top of over-wet concrete. Laitance may be detected by scraping the concrete surface with a putty knife; if a quantity of loose powdery material is observed or easily removed, excessive laitance may be considered to be present.

**LATEX:** A COLLOIDAL DISPERSION of a polymer or elastomer in water that coalesces into a film upon evaporation of the water. (See EMULSION; COLLOIDAL DISPERSION)

**LCA:** See LIFE-CYCLE ASSESSMENT.

**LEADER HEAD:** See CONDUCTOR HEAD.

**LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN (LEED):** Commonly referred to as LEED, it is a prominent green building rating system, developed by the United States Green Building Council (USGBC), that provides a suite of standards for environmentally sustainable construction. Energy efficiency, through proper application of insulation and air sealing technologies, plays an important role in the LEED evaluation process.

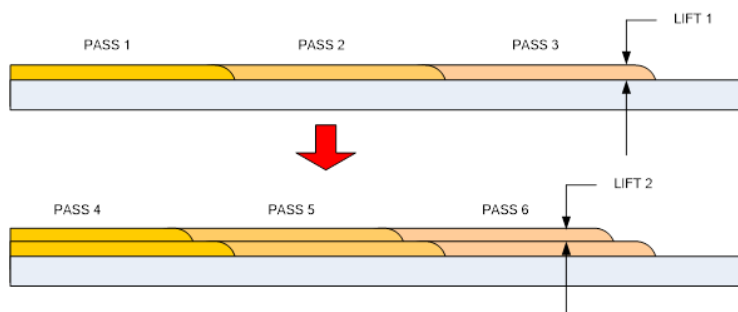
**LEED:** See LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN.

**LIFE CYCLE ANALYSIS:** See LIFE-CYCLE ASSESSMENT.

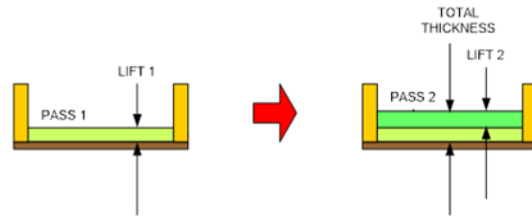
**LIFE-CYCLE ASSESSMENT (LIFE-CYCLE ANALYSIS, LCA):** An accounting and evaluation of the environmental aspects and potential impacts of materials, products, assemblies, or buildings throughout their life, from raw material acquisition through manufacturing, construction, use, operation, demolition, and disposal.

**LIFE-CYCLE INVENTORY (LIFE-CYCLE INVENTORY ANALYSIS, LCI, LCIA):** The identification and quantification of energy, resource usage, and environmental emissions for a particular product, process, or activity.

**LIFT:** The sprayed polyurethane foam resulting from tying together the perimeter of adjacent passes of foam in a specific area, as shown in Figure A below. A lift is defined by its thickness. Multiple lifts over the same area may be needed to achieve the final foam thickness. For example, a one inch lift of foam can be installed over a 20 x 20 ft area, and then a second lift of foam 1.5 inch thick can be installed to the same area to create a final installed thickness of 2.5 inches. For small areas, such as between framing members, a lift of foam is synonymous with a pass of foam per Figure B below.



LIFT FIGURE A: Lift definition for low-slope roofing



LIFT FIGURE B: Lift and pass are synonymous for SPF insulation applications

**LIFT LINE:** See KNIT LINE.

**LIVE LOAD:** The weight on a roof of temporary, mobile loads, such as foot traffic, roofing equipment, water, snow, and ice.

**LOW-DENSITY SPF (OPEN-CELL SPF, ocSPF):** A type of SPF expanded with reactive blowing agents to yield a semi-rigid cellular structure and a density between 8–22 kg/m<sup>3</sup> (0.4 and 1.4 lb/ft<sup>3</sup>).

**LOW PRESSURE SPF:** See SPF, LOW PRESSURE.

**LOW-TEMPERATURE FLEXIBILITY:** The ability of a membrane or another material to remain flexible (resist cracking when flexed), after the membrane or material has been cooled to a low temperature.

## M

**MASTIC:** A coating material of relatively thick consistency.

**MATERIAL SAFETY DATA SHEET (MSDS):** A standard formatted information sheet prepared by a material manufacturer that describes the potential hazards, physical properties, and procedures for the safe use of a material.

**MDI:** See METHYLENE DIPHENYL DIISOCYANATE.

**MECHANICAL BOND:** See BOND, MECHANICAL.

**MECHANICAL DAMAGE:** Breaks or punctures to insulation and coating systems as a result of impact or abrasion.

**MEDIUM-DENSITY SPF (CLOSED CELL SPF, ccSPF):** A type of SPF expanded with non-reactive blowing agents to yield a rigid cellular structure. It is characterized by a predominance of closed cells and a density between 1.5–2.5 lb./ft<sup>3</sup>.

**MEMBRANE:** A layer of material that acts to prevent the passage of a substance. Membranes may restrict the passage of air, liquid water, or water vapor. Some membranes allow the passage of some substances, while excluding others.

**MEMBRANE REINFORCEMENT:** Fabrics or fibers embedded in mastic or coating to provide strength and impact resistance.

**METHYLENE DIPHENYL DIISOCYANATE (MDI):** Component-A in SPF. An organic chemical compound having two reactive isocyanate (-N=C=O) groups. It is mixed with the B-component to form polyurethane.

**MIL:** One-thousandth of an inch; 0.001 in. (0.025 mm). A unit used to measure coating thickness.

**MILDEW:** A superficial coating or discoloring of an organic material due to fungal growth, especially under damp conditions.

**MIST COAT:** A very thin sprayed coat.

**MOLD:** Fungal growths often resulting in deterioration of organic materials, especially under damp conditions.

**MOISTURE VAPOR TRANSMISSION (MVT):** *See* WATER VAPOR TRANSMISSION, DIFFUSION.

**MONOLITHIC:** Formed from or composed of a single material; seamless.

**MSDS:** *See* MATERIAL SAFETY DATA SHEET.

**MUD-CRACKING:** The defect in an applied coating or mastic when it cracks into large segments or shrinks (also called alligatoring). When the action is fine and incomplete, it is usually referred to as “checking.”

**MULTIPLE COAT:** Two or more layers of coating applied to a substrate.

## N

**NEOPRENE RUBBER:** A synthetic rubber having physical properties closely resembling those of natural rubber. Made by polymerization of chloroprenes.

**NFPA:** National Fire Protection Association. The NFPA promotes safety from fire and other hazards through the promulgation of codes, standards, research, training and education.

**NIGHT SEAL:** A material and/or method used to temporarily seal a membrane edge during construction to protect the roofing assembly in place from water penetration. May be removed when the roofing application is resumed.



**NOISE REDUCTION COEFFICIENT (NRC):** A representation of the amount of sound energy absorbed upon striking a particular surface. An NRC of 0 indicates perfect reflection (strong echo), and an NRC of 1 indicates perfect absorption (lack of echo).

**NON-BREATHING MEMBRANE:** A membrane material that has a significantly greater resistance to the diffusion of water vapor than the other materials with which it is used.

**NON-FERROUS METAL:** All metals that are not iron compounds (i.e., copper, lead, gold, silver, and aluminum). These metals are non-magnetic.

**NON-FLAMMABLE:** Not easily ignited and will not burn rapidly if ignited. The material may still burn and be considered combustible. OSHA defines a flammable liquid as any liquid having a flashpoint below 100°F (37.8°C).

**NON-OXIDIZING:** A material that resists oxidation in exterior exposures or accelerated weathering.

**NON-VOLATILE CONTENT:** That portion of a coating material that does not evaporate under normal ambient conditions. *Compare with SOLIDS CONTENT. (See SOLIDS CONTENT.)*

**NRCA:** National Roofing Contractors Association.

## O

**OCF:** One-Component Foam. (*See SINGLE-COMPONENT FOAM.*)

**ocSPF:** Open-cell SPF. (*See LOW-DENSITY SPF INSULATION.*)

**OFF-GASSING:** *See OUTGASSING.*

**OFF-RATIO FOAM:** An off-ratio foam is caused by a deficiency of one of the component chemicals (A- or B-side) during application. The reaction of an off-ratio foam is readily visible to the trained SPF applicator. Off-ratio foam will negatively affect SPF yield, performance, and worker safety.

**ONE-COMPONENT FOAM:** *See SINGLE-COMPONENT FOAM.*

**OPEN-CELL SPF:** *See LOW-DENSITY SPF INSULATION.*

**OPTICAL COMPARATOR:** An eyepiece with magnification ranging from 4–12 power, with a scale used for measuring thickness.

**ORANGE PEEL SURFACE TEXTURE:** The surface texture of SPF, which exhibits a fine granular texture and is compared to the exterior skin of an orange. This surface is considered acceptable for receiving a protective coating. This surface requires at least 10% additional coating material to the theoretical amount. (*See SPFA-145, "Surface Texture of Spray Polyurethane Foam."*)

**ORGANIC:** Compounds containing carbon.

**ORIFICE:** An opening or aperture. The opening in the tip of a spray gun.

**OUTGASSING:** The slow release of a gas that was trapped, frozen, absorbed, or adsorbed in some material. Sometimes called “off-gassing,” particularly when in reference to indoor air quality.

**OVERSPRAY:** (1) Airborne spray loss of polyurethane foam or coatings. (2) Undesirable depositions of airborne spray loss.

**OVERSPRAY SURFACE TEXTURE:** The surface shows a linear coarse textured pattern and/or a pebbled surface. This surface is generally downwind of the sprayed polyurethane path and is unacceptable for proper coating coverage and protection, if severe.

## P

**p-MDI:** See POLYMERIC MDI.

**PAPR:** See POWERED-AIR PURIFYING RESPIRATOR.

**PARAPET:** A wall or top portion of a wall extending above an attached horizontal surface such as a roof, terrace, or deck; often used to provide a safety barrier at a roof edge.

**PASS:** The volume of coating or polyurethane foam applied by moving the gun from side to side and moving away from fresh material in a single continuous application. A pass is defined by its width, length and thickness. Foam passes sprayed and tied together along their adjacent edges to cover a larger area are called a lift of foam. (See LIFT)

**PASS LINES:** Pass lines are created when the end of a pass of foam or coating ties into an adjacent pass. The overlapping of the polyurethane foam or coating can be seen typically as a darker color than the middle of the pass. Foam at the pass lines typically contain thinner lifts than the middle of the foam pass as the applicator tapers the foam to uniformly tie the foam passes together.

**PCF:** Pounds per cubic foot or lb/ft<sup>3</sup>. A measure of density.

**PEEL STRENGTH:** The average force (or force per unit width) required to peel a membrane or other material from the substrate to which it has been bonded.

**PEELING:** Top-coating film inadequately bonded with undercoats resulting in partial delamination or detachment of final coat.

**PENETRATION:** (1) Any object, such as vent pipes, electrical conduit, ducts, structural supports elements, etc., passing through a roof, wall, floor, or other building assembly. (2) Any hole or opening in a building assembly that would allow the passage of air, water, or other fluids.

**PERM:** A unit of water vapor permeance defined as 1 grain of water vapor per square foot per hour per inch of mercury water vapor pressure difference (1 in. of mercury = 0.49 psi). Perm = 1 grain/ft<sup>2</sup>•hr•in. Hg. The SI unit for permeance is ng/s•m<sup>2</sup>•Pa (1 perm = 57.4 ng/s•m<sup>2</sup>•Pa).

**PERM RATING:** The permeance of a material. Breather materials have relatively high perm ratings, vapor retarders have relatively low perm ratings, and vapor barriers have essentially zero (negligible) perm ratings. (*See also* VAPOR RETARDERS.)

**PERMEABILITY, AIR:** The rate at which air will diffuse through a unit area of material induced by a unit differential in air pressure. Air permeability is generally used as a descriptive term and specific values are not usually reported. (*See* PERMEANCE, AIR.)

**PERMEABILITY, WATER VAPOR:** The rate at which water vapor will diffuse through a unit thickness and area of material, induced by a unit differential in water vapor pressure. Permeability values are related to a common thickness and can be used to compare various materials. Units are usually grains•in./ft<sup>2</sup>•hr•in Hg or perm•in. SI unit for permeability is ng/s•m•Pa (1 perm•in = 1.46 ng/s•m•Pa).

**PERMEANCE, AIR:** The rate at which air can diffuse or leak through a unit area of material induced by a specific pressure differential, for example, 75 Pa or 1.57 lb/ft<sup>2</sup>. ASTM E 2178 and ASTM E 283 are the test methods used to measure air permeance. Units are L/s•m<sup>2</sup> (ft<sup>3</sup>/min•ft<sup>2</sup>) with pressure reported as Pa (lb/ft<sup>2</sup>). (*See also* AIR IMPERMEABLE; AIR PERMEABLE.)

**PERMEANCE, WATER VAPOR:** The rate at which water vapor will diffuse through a unit area of material induced by a unit differential in water vapor pressure. Permeance values are reported for specific thicknesses (usually recommended application thickness). Units are usually grains/ft<sup>2</sup>•hr•in Hg or perm. SI unit for permeance is ng/s•m<sup>2</sup>•Pa (1 perm = 57.4 ng/s•m<sup>2</sup>•Pa).

**PERSONAL PROTECTIVE EQUIPMENT (PPE):** Includes all protective equipment and supplies designed to protect employees from serious workplace injuries or illnesses resulting from contact with chemical, radiological, physical, electrical, mechanical, or other workplace hazards. Besides face shields, safety glasses, hard hats, and safety shoes, PPE includes a variety of devices and garments, such as goggles, coveralls, gloves, vests, earplugs, and respirators.

**pH:** A measure of acidity/alkalinity of aqueous mixtures. A measure of pH 7 is neutral, lower is more acidic, and higher is more alkaline.

**PICTURE FRAMING:** Outlining the perimeter of a stud wall cavity with SPF prior to filling the center.

**PIGMENT:** Finely ground insoluble dispersed particles (powder) that when dispersed in a coating, may provide resistance to UV radiation, better resistance to weathering, hardness, durability, reflectivity, and other properties in addition to color.

**PINHOLE:** A surface defect in polyurethane foam and/or coating that appears as a small hole as if made by a pin. The term is generally applied to holes caused by expanding gases from solvents, moisture, or other volatile compounds or SPF cells open to the surface. (*See* BLOWHOLE.)

**PLASTICIZER:** A substance added to a plastic or coating to increase its flexibility or elongation.

**POLYISO:** *See* ISOCYANURATE.

**POLYMER:** A substance consisting of high-molecular-weight chemical compounds characterized by chains of repeating simpler units.

**POLYMERIC MDI (p-MDI):** Isocyanate compounds wherein the molecules contain more than two functional -NCO groups. (*See also* METHYLENE DIPHENYL DIISOCYANATE.)

**POLYOL:** A high-weight molecule that contains hydroxyl groups (-OH), typically at the terminal position on the molecular chain. Polyol is a primary ingredient in the B-side or resin of the two-component polyurethane system. After reaction with MDI (A-side), the polyol becomes part of the polyurethane polymer.

**POLYURETHANES:** Polyol and MDI react to form polyurethane. When this reaction occurs multiple times, a polyurethane molecule is created. Many end-use products are created using polyurethane chemistry, including rigid and flexible foams, rigid or flexible coatings, elastomers, structural materials, etc. (*See also* AROMATIC; ALIPHATIC; ISOCYANATE; POLYOL; RESIN.)

**POLYURETHANE COATINGS:** A one- or two-part coating that contains polyisocyanate monomer and a hydroxyl containing resin, which react during cure to form a polyurethane elastomer.

**PONDING:** The accumulation of water in low-lying areas that exceeds the manufacturer's specification and/or contract documents. (*See* POSITIVE DRAINAGE.)

**POPCORN SURFACE TEXTURE:** The surface exhibits texture of SPF where valleys form sharp angles. This surface is unacceptable for coating application. Also termed "treebark surface texture." (*See* SPFA-145, "Surface Texture of Spray Polyurethane Foam.")

**POSITIVE DRAINAGE:** The condition in which there is no consequential standing water on the roof 48 hours after a rain. (*See* PONDING.)

**POST EXPANSION:** A characteristic of some single-component SPFs wherein additional expansion occurs after the initial application and froth expansion. Post expansion is due mainly to the chemical curing process.

**POT LIFE:** The period of time during which a multi-component or catalyzed material remains suitable for application after being mixed.

**POUR FOAM:** A polyurethane foam system, with a slower reactivity profile (relative to SPF), designed for pouring or injection into confined spaces such as a mold, panel, or concrete blocks.

**POWERED-AIR PURIFYING RESPIRATOR:** A type of air purifying respirator which consists of a powered fan that forces incoming air through one or more filters for delivery to the user for breathing. The fan and filters may be carried by the user or, with some units, the air is fed to the

user via tubing while the fan and filters are remotely mounted. (See RESPIRATOR.)

**PPE:** See PERSONAL PROTECTIVE EQUIPMENT.

**PRIMER:** The first layer of coating applied to a surface to improve the adhesion of subsequently applied materials or to inhibit corrosion.

**PROPELLANT:** Liquified or compressed gas formulated into single-component SPF or two-component FROTH PACKS used to expel the SPF ingredients from its containers. The propellant also functions as a BLOWING AGENT. (See *also* BLOWING AGENT; FROTH PACKS.)

**PROPORTIONER:** The basic pumping unit for spraying polyurethane foam or two-component coating systems. Consists of two positive displacement pumps designed to dispense two components at a precisely controlled ratio.

**PSI:** Pounds per square inch (lb/in<sup>2</sup>).

**PSYCHROMETER:** (1) A device for measuring ambient humidity by employing a dry-bulb thermometer and a wet-bulb thermometer. (2) An electronic device for measuring ambient temperature and humidity.

**PSYCHROMETRIC CHART:** A diagram relating the properties of humid air with temperature.

**PURGE:** To cleanse or remove liquid materials from equipment or hoses.

## Q

**QUV:** An apparatus used to simulate the effects of weathering of materials.

## R

**R-VALUE:** The resistance of a material to heat transfer. Insulators have relatively high R-Values. Units are °K•m<sup>2</sup>/W (°F•ft<sup>2</sup>•hr/Btu).

**RACKING TEST:** Colloquial name for ASTM E 72, “Standard Methods of Conducting Strength Tests of Panels for Building Construction.” ASTM E 72 tests a stud wall’s resistance to wind, seismic, and weight loads.

**RCI:** Roof Consultants Institute.

**RADIANT BARRIERS:** Typically in the form of a single highly reflective sheet or coating (e.g., aluminum foil or metallized mylar), radiant barriers are applied as a component of the building enclosure to inhibit heat transfer by thermal radiation. They do not provide resistance to heat transfer by conduction or convection.

**RECOVERING:** The process of installing a new roofing system over an existing roofing system.

**RECYCLE CONTENT:** The proportion of material (typically percentage by weight) in an end-use product that contains previously used materials. Recycle content can be further classified as “post-industrial” or “post-consumer.” The former refers to re-use of by-product materials that are created during the manufacturing process, while the latter refers to waste materials that come from the consumer sector.

**REFLECTANCE:** The fraction of incident radiation (usually the visible spectrum of sunlight) that is scattered (i.e., not absorbed or transmitted) by a surface. Reflectance is expressed as a number between 0–1 or as a percentage between 0%–100%. Cool roofs and reflective coatings have high reflectance values. (*See also* REFLECTIVITY.)

**REFLECTIVE INSULATION:** Similar to radiant barriers, reflective insulations are made from multiple sheets of highly reflective film that inhibit heat transfer by radiation. Multiple sheets of the reflective film are formed to create thin air pockets that can reduce heat transfer by conduction and convection in certain applications. Examples of reflective insulation would be a metalized bubble-wrap material or foil panels that unfold or deploy into a sheet with integral air compartments.

**REFLECTIVITY:** *See* REFLECTANCE.

**REGLET:** (1) An interlocking two-part flashing between a wall or other vertical surface and a roof. (2) A sheet metal clamp or receiver attached to a wall to which a counterflashing may be affixed. (3) A groove in a vertical surface to which a counterflashing may be affixed.

**RELATIVE HUMIDITY:** The ratio of absolute humidity to saturation humidity, expressed as a percentage.

**RENEWABLE CONTENT:** *See* BIO-CONTENT.

**REPLACEMENT:** The process of removing an existing roof and installing a new roofing system.

**RE-ROOFING:** Either the recovering or the replacement of a roofing system. (*See* RECOVERING; REPLACEMENT.)

**RESIDENTIAL ENERGY SERVICES NETWORK (RESNET):** A trade association of energy raters (HERS Raters) serving the residential market. This organization provides training and certification to home energy raters. Certified home energy raters must evaluate the entire energy use of a residential building in order for the building to become EnergyStar certified.

**RESIN:** (1) Component-B in SPF. This component contains a polyol, catalyst, blowing agent, fire retardant, and surfactants. It is mixed with the A-component to form polyurethane. (2) General term applied to a wide variety of more or less transparent and fusible products, which may be natural or synthetic. Higher molecular weight synthetic resins are referred to as polymers. (3) Any polymer that is a basic material for coatings and plastics.

**RESNET:** See RESIDENTIAL ENERGY SERVICES NETWORK.

**RESPIRATOR:** A device designed to protect the wearer from inhaling harmful dusts, fumes, vapors, and/or gases. Respirators come in a wide range of types and sizes. There are two main categories: (1) the air purifying respirator, which forces contaminated air through a filtering element; and (2) the air-supplied respirator, in which an alternate supply of fresh air is delivered. Within each category, different techniques are employed to reduce or eliminate noxious airborne contaminants. Some respirators require medical screening and fit testing. (See AIR PURIFYING RESPIRATOR; POWERED-AIR PURIFYING RESPIRATOR; SUPPLIED-AIR RESPIRATOR.)

**RESPIRATORY PROTECTION PROGRAM:** An OSHA requirement whereby any employer who requires or permits employees to wear a respirator must have a written Respiratory Protection Program. The written respirator program establishes standard operating procedures concerning the use and maintenance of respiratory equipment. In addition to having such a written program, the employer must also be able to demonstrate that the program is enforced and updated as necessary. (See CPI Publication AX246, “Model Respiratory Protection Program for Compliance with the Occupational Safety and Health Administration’s Respiratory Protection Program Standard 29 CFR § 1910.134.”)

**RETROFIT:** The modification of an existing building or facility to include new systems or components.

**ROOF CURB:** Raised frame used to mount mechanical units, such as air conditioning or exhaust fans, skylights, etc.

**ROOF SLOPE:** The angle of a roof surface measured in the number of inches of vertical rise in a horizontal length of 12 in.

**ROOFING FOAM:** Spray polyurethane foam used in exterior roofing applications. Roofing foam nominal core density is typically 40–56 kg/m<sup>3</sup> (2.5–3.5 lb/ft<sup>3</sup>) and compressive strength is typically 280 kPa (40 lb/in.<sup>2</sup>) minimum. Building codes do not limit the smoke development index (per ASTM E 84) for roofing foams; therefore, roofing foams should not be used for interior applications.

**RUST BLUSH:** The earliest stage of rusting characterized by an orange or red color. Occurs frequently on freshly sandblasted steel if allowed to stand too long before coating.

## S

**SADDLE:** A relatively small raised substrate or structure constructed to channel or direct surface water to drains or off the roof. A saddle may be located between drains or in a valley, and is often constructed like a small hip roof or like a pyramid with a diamond-shaped base. (See CRICKET.)

**SAG:** Undesirable excessive flow or run in material after application to a sloped or vertical surface.

**SAR:** See SUPPLIED-AIR RESPIRATOR.

**SATURATION HUMIDITY:** The maximum concentration of water vapor in the air at a given temperature before condensation occurs.

**SBCCI:** Southern Building Code Congress International. SBCCI, once one of three model code agencies in the United States, developed the Southern Building Code, which had been commonly adopted in the Southern U.S. SBCCI has been absorbed into the ICC. (See also INTERNATIONAL CODE COUNCIL.)

**SCARF:** To remove the surface or coating from polyurethane foam by cutting, grinding, or other mechanical means. Synonymous with SCARIFY.

**SCARIFY:** See SCARF.

**SCRIM:** A woven, non-woven, or knitted fabric, composed of continuous strands of material used for reinforcing or strengthening membranes. Scrim may be incorporated into a membrane by the laminating or coating process.

**SCUPPER:** An opening in a parapet wall allowing runoff water to exit a roof.

**SCV:** Solid content by volume.

**SEALANT:** Any of a variety of compounds used to fill and seal joints or openings in wood, metal, masonry, and other construction materials. Some common types of sealants are Neoprene, polysulfide, acrylic latex, butyl, polyurethane, foams, and silicone.

**SEALANT FOAM:** One- or two-component polyurethane foam typically applied as a bead and used to control air leakage as part of an air barrier system within the building envelope. Sealant foams generally have nominal core densities of 8–40 kg/m<sup>3</sup> (0.5–2.5 lb/ft<sup>3</sup>).

**SELF-FLASHING:** The ability of sprayed polyurethane foam to be applied around a penetration or at a roof transition without the need for other materials.

**SERVICE TEMPERATURE LIMITS:** The maximum continuous temperature at which a coating, polyurethane foam, or other material will perform satisfactorily.

**SET:** To convert into a fixed or hardened state by chemical or physical action.

**SET OF FOAM:** A container of A-side (MDI) and a container of B-side (polyol or resin blend) that can be combined through mixing equipment to form SPF. A set of foam consists of two containers, typically 55-gallon drums.

**SHELF LIFE:** The period of time within which a material remains suitable for use. Synonymous with STORAGE LIFE.



**SHORE HARDNESS:** A measure of hardness based on the Shore scale.

**SILICONE COATING:** A liquid-applied, solvent dispersed, elastomeric protective coating whose principal polymer in the dispersion contains more than 95% silicone resin. Some high-solids silicone coatings may have little or no solvent content.

**SINGLE-COMPONENT FOAM:** A fully formulated foam system packaged in a single aerosol can or pressurized cylinder. Essentially a moisture cure polyurethane prepolymer in a pressurized container. Also called One-Component Foam or OCF.

**SKINNING:** The formation of a dense film on the surface of a liquid coating or mastic.

**SLIT SAMPLES:** Small cut samples approximately 2 in. long, 1/2 in. wide, and 3/4 in. deep that are taken for evaluation of sprayed materials.

**SMOKE DEVELOPED:** The amount of smoke measured for a sample tested in the ASTM E 84 tunnel test when compared to inorganic reinforced cement board and select-grade red-oak flooring, which have been arbitrarily established as 0 and 100, respectively.

**SMOOTH SURFACE TEXTURE:** The surface texture of SPF that exhibits spray undulation and is ideal for receiving a protective coating. Even though the surface texture is classified as smooth, this surface requires at least 5% additional coating material to the theoretical amount. (*See SPFA-145, "Surface Texture of Spray Polyurethane Foam."*)

**SOCIETY OF THE PLASTICS INDUSTRY:** A trade association representing the interests of the plastics industry.

**SOLAR REFLECTANCE:** The measure of a surface material's ability to scatter sunlight. COOL ROOFS and reflective coatings typically have a high solar reflectance. Also termed "albedo." (*See also COOL ROOFS.*)

**SOLAR REFLECTANCE INDEX (SRI):** A calculated index (0–100+ based on ASTM E 1980) that combines a surface material's solar reflectance and infrared emittance into a single value. The SRI provides a relative indication of how hot a surface material will become when exposed to sunlight. Cool surfaces have high index values, while hot surfaces have low index values.

**SOLIDS CONTENT:** The percentage of non-volatile matter in a coating or mastic formulation; may be expressed as a volume or weight percent.

**SOLVENT:** A liquid that dissolves other substances. (*See also THINNER.*)

**SOUND TRANSMISSION CLASS (STC):** An integer rating of how well a building partition reduces airborne sound. STC is widely used to rate interior partitions, ceilings/floors, doors, windows, and exterior wall configurations.

**SPI:** *See also* SOCIETY OF THE PLASTICS INDUSTRY.

**SPI / SPFD:** The Society of the Plastics Industry / Spray Polyurethane Foam Division. From 1987 to 1999, SPFA was known as SPFD a division of SPI. In 1999, SPFA became an independent trade association, with strong collaborative relationships with the American Chemistry Council's (ACC's) Center for the Polyurethanes Industry (CPI), Insulation Contractors Association of America (ICAA), and the National Roofing Contractors Association (NRCA).

**SPF:** Acronym for SPRAY POLYURETHANE FOAM.

**SPF, HIGH PRESSURE:** Spray polyurethane foam where the A- and B-components are delivered at a pressure between 1000 and 1300 psi, at a rate up to 30 lb/min wherein the components are atomized and impingement mixed in a spray gun.

**SPF, LOW PRESSURE:** Spray polyurethane foam where the A- and B- components are delivered a pressure of less than 250 psi, at a rate between 5 and 7 lb/min wherein the components are mixed using a static mixing nozzle. Components are typically delivered in pressurized tanks.

**SPFA:** Spray Polyurethane Foam Alliance.

**SPFA DOCUMENTS:** Technical and informational documents published by the Spray Polyurethane Foam Alliance (SPFA) for use by members and distribution to the public. Documents are numbered "SPFA-XXX." (Previous documents were designated "AY," which was developed as part of a numbering system by the Society of the Plastics Industries.)

**SPRAY POLYURETHANE FOAM (SPF):** A foamed plastic material formed by the reaction of an isocyanate and a polyol, and by employing a blowing agent to develop a cellular structure. Spray polyurethane foam, may be a two-component reactive system mixed at a spray gun or a single-component system that cures by exposure to moisture. SPF can be formulated to have physical properties appropriate for the application requirements, such as density, compressive strength, closed cell content, and R-Value. Common uses of SPF include insulation, air barrier, and roofing membrane.

**SPUD:** To remove the roofing aggregate and most of the bituminous top coating by scraping and chipping.

**SQUARE:** A standard measurement for roofing area equal to 100 square feet. Also called "roofing square."

**SRI:** See SOLAR REFLECTANCE INDEX.

**STACK EFFECT:** Also referred to as the "chimney effect," stack effect results from air density differences between building interiors and exteriors. During heating seasons, the stack effect results in higher relative pressures at the tops of buildings and lower relative pressures at the bases of buildings. These pressure differences can drive air infiltration/exfiltration. Proper sealing measures, such as air barriers formed by SPF and sealants, can mitigate stack effect.

**STC:** See SOUND TRANSMISSION CLASS.

**STORAGE LIFE:** See SHELF LIFE.

**STRESS:** An applied force that tends to deform a body. May be tensile stress (pulling or stretching force), compressive stress (pushing or compacting force), or shear stress (opposite, but offset parallel forces tending to produce a sliding motion).

**STRESS-CRACK:** External or internal cracks within a material caused by long-term stress.

**SUBSTRATE:** The surface to which polyurethane foam is applied.

**SUPPLIED-AIR RESPIRATOR (SAR):** Often referred to as an airline respirator. These devices provide air to the user, through an airline, from a source located some distance away. (See RESPIRATOR.)

**SURFACE EROSION:** The wearing away of a surface due to abrasion, dissolution, or weathering.

**SURFACE TEXTURE:** The resulting surface from the final pass of SPF. The following terms are used to describe the types of SPF surfaces: smooth, orange peel, coarse orange peel, verge of popcorn, popcorn, treebark, and overspray.

**SURFACING:** The top layers of a roof covering, specified or designed to protect the underlying roofing from direct exposure to the weather.

**SURFACTANT:** Short for “surface active agent.” Used to alter the surface tension of liquids. An ingredient in polyurethane foam formulations to aid in mixing and controlling cell size.

## T

**TACK-FREE:** A curing phase of polyurethane foam wherein the material is no longer sticky.

**TACK-FREE TIME:** The time between the start of mixing the two SPF-forming components and the time that the surface of the foam can be touched with a wooden stick without it sticking.

**TEAR STRENGTH:** The maximum force required to tear a specimen, the force acting substantially parallel to the major axis of the test specimen. Values reported as a stress per unit of thickness.

**TENSILE STRENGTH:** The tensile (pulling or stretching) force necessary to rupture a material sample divided by the sample’s original cross sectional area. Units are usually kPa or psi or lb/in<sup>2</sup>.

**TERMINATION:** The treatment or method of anchoring and/or sealing the free edges of the membrane in roofing or waterproofing system.

**THERMAL BARRIER:** A material applied over spray polyurethane foam (and other foam plastics) designed to slow the temperature rise of the foam during a fire situation and delay its involvement in the fire. With certain exceptions, building codes require that SPF be separated from interior spaces with a thermal barrier. Building codes define thermal barriers as those

specifically listed in the code (such as ½-inch gypsum wallboard) or those tested in accordance with NFPA 275 (meeting both the Temperature Transmission Fire Test and the Integrity Fire Test).

**THERMAL BRIDGE:** A thermally conductive material that penetrates or bypasses an insulation system such as a metal fastener or stud.

**THERMAL CONDUCTANCE (C):** A unit of heat flow that is used for a specific thickness of material or for materials of composite construction, such as laminated insulation.  $C=k/\text{thickness}$ . Units are  $W/m^2 \cdot ^\circ K$  (Btu/hr•ft<sup>2</sup>•°F).

**THERMAL CONDUCTIVITY (k):** The heat energy that will be transmitted by conduction through 1 sq. ft of 1 in. thick homogeneous material in 1 hr when there is a difference of 1 degree Fahrenheit perpendicularly across the two surfaces of the material. Units are  $W/m \cdot ^\circ K$  (Btu•in/hr•ft<sup>2</sup>•°F).

**THERMAL MOVEMENT:** Changes in the dimension of a material as a result of temperature changes.

**THERMAL RESISTANCE (R):** An index of a material's resistance to heat flow; it is the reciprocal of thermal conductance (C) or the thickness divided by THERMAL CONDUCTIVITY (k). (*See also R-VALUE; THERMAL CONDUCTIVITY*).

**THERMAL SHOCK:** The stress-producing phenomenon resulting from sudden temperature drops in a roof membrane, for example, a rain shower following brilliant sunshine.

**THERMOGRAPHY:** *See* INFRA-RED THERMOGRAPHY.

**THERMOPLASTIC:** A polymer that softens and/or melts when heated. Polystyrene is an example of a thermoplastic material.

**THERMOSET:** A polymer that irreversibly cures to its finished state through a catalytic reaction. Unlike thermoplastic foam, a thermoset foam cannot be melted. Polyurethane spray foam and polyisocyanurate board foam are examples of thermoset materials.

**THINNER:** A liquid used to reduce the viscosity of coatings or mastics. Thinners evaporate during the curing process. Thinners may be used as solvents for cleanup of equipment.

**THIXOTROPIC:** Having the property of decreasing viscosity with increasing shear stress. A coating is thixotropic if it thins with stirring or pumping, but thickens again when movement ceases.

**TIE-IN LINES:** The starting or stopping point at which new foam is applied to foam that had been sprayed earlier.

**TINT:** A color produced by the introduction of small amounts of a colored pigment.

**TOXICITY:** The quality, property, or degree of being poisonous or toxic.

**TRANSITION MATERIAL:** A material (typically a tape or membrane) or a combination of materials used between adjacent building-envelope components to provide continuity for an air barrier or water resistive barrier assembly.

**TREEBARK SURFACE TEXTURE:** *See* POPCORN SURFACE TEXTURE.

**TWO-COMPONENT SYSTEM:** A coating or polyurethane foam formed by the mixing and the reaction of two different materials.

**TWO-PART SYSTEM:** *See* TWO-COMPONENT SYSTEM.

## U

**UBC:** Uniform Building Code. A model code promulgated by the ICBO. The UBC has largely been displaced by the I-CODES®. (*See also* ICBO, I-CODES.)

**U-FACTOR:** The U-factor, or thermal transmittance, is a measure of the thermal conductivity for a building enclosure assembly (e.g., wall, floor, ceiling, roof) or a building component (e.g., window, door). Incorporating parallel and series conductive heat transfer principles and the R-VALUE or thermal conductivities of each component in the assembly, the U-factor can be calculated. The U-factor, when multiplied by the surface area and the indoor-outdoor temperature difference, predicts the amount of heat loss through the assembly, which means assemblies with low U-factors are more energy efficient. U-factors are typically expressed as (Btu/hr•ft<sup>2</sup>•F) or (W/m<sup>2</sup>•C). (*See* R-VALUE; THERMAL CONDUCTIVITY.)

**UFFI:** *See* UREA-FORMALDEHYDE INSULATION.

**UL:** Underwriter’s Laboratory. An independent testing agency.

**ULTRA-VIOLET RADIATION (UV):** Electro-magnetic radiation beyond the visible spectrum at its violet end. Invisible high-energy sunlight that degrades many organic materials.

**UNDERLAYMENT:** A material that is laid down as a substrate for the sprayed polyurethane foam to make the surface smooth or to give a specific rating for interior fire exposures.

**UPLIFT:** *See* WIND UPLIFT.

**UREA-FORMALDEHYDE FOAM INSULATION (UFFI):** Urea-formaldehyde foam insulation was developed as an improved means of insulating difficult-to-reach cavities in house walls. It is typically made at a construction site from a mixture of urea-formaldehyde resin, a foaming agent, and compressed air. When the mixture is injected into the wall, urea and formaldehyde unite and “cure” into an insulating foam plastic. The chemistry of UFFI and SPF are very different, as SPF contains no added formaldehyde.

**UV:** An abbreviation for ultraviolet. (*See also* ULTRAVIOLET RADIATION)

**V**

**VAPOR BARRIER:** (1) A membrane, coating, or other material that has very low water vapor transmission rates. (2) A component within a building assembly used to limit the transmission of water vapor by diffusion. Note: The term vapor barrier is imprecise and the term VAPOR RETARDER is generally preferred. (*See also* VAPOR RETARDER.)

**VAPOR MIGRATION:** The movement of water vapor from a region of high vapor pressure to a region of lower vapor pressure.

**VAPOR PRESSURE:** The portion of atmospheric pressure contributed by water vapor; an indicator of absolute humidity. Units are kPa (in Hg).

**VAPOR RETARDER:** A vapor retarder is a component of the building enclosure used to control moisture diffusion through the component or assembly. It is generally placed at the warm side of the enclosure assembly to control condensation within the assembly. In terms of the International Model Building Codes, there are three classes of vapor retarders used in building enclosures, categorized as follows, based on the measured water vapor transmission per ASTM E 96 dry-cup or desiccant method A. Class I: less than 0.1 perms, for example, a 6 mil polyethylene sheet. Class II: greater than 0.1 perms but less than or equal to 1.0 perms. Class II vapor retarders are generally required in colder climates; check with the local building code. Examples of Class II vapor retarders include asphalt-kraft facings, ~2 inches of medium-density SPF. Class III: greater than 1.0 perms but less than or equal to 10 perms.

**VERGE OF POPCORN SURFACE TEXTURE:** The verge of popcorn surface is the roughest texture suitable for receiving the protective coating. The surface shows a texture where nodules are larger than valleys, with the valleys relatively curved. The surface is considered undesirable due to the additional amount of coating required to protect the surface. This surface requires at least 50% additional material to the theoretical amount. (*See* SPFA-145, “Surface Texture of Spray Polyurethane Foam.”)

**VISCOSITY:** The thickness or resistance to flow of a liquid. Viscosity generally decreases as temperature increases.

**VOC:** *See* VOLATILE ORGANIC COMPOUNDS.

**VOLATILE ORGANIC COMPOUNDS:** Generally carbon-containing compounds that have sufficient vapor pressure to be present as a gas or vapor at room temperatures. The EPA specifically defines regulated VOCs in 40 CFR51.100s. In the United States CLOSED CELL SPF systems generally contain fluorocarbon blowing agents (HFC, HCFC, or CFC) that are not classified as VOCs by the U.S. EPA. (*See* CFC; CLOSED CELL SPF; HFC; HCFC.)

## W

**WALKWAYS:** High-traffic and high-service areas on a rooftop, particularly those with vents, hatches, and heavy-duty air conditioning units, that have been reinforced with extra coating and granules to prevent damage to the polyurethane foam system.

**WATER ABSORPTION:** The percentage increase in the weight of a specimen after immersion in water for a specified time. For SPFs, water absorption is reported as a volume percentage in accordance with ASTM D 2842.

**WATER-BLOWN FOAM:** A spray polyurethane foam formulation of any density that uses water as the predominant (reactive) blowing agent.

**WATER-RESISTANT BARRIER (WRB):** Materials or a combination of materials that are primarily designed to be used to keep liquid water from entering the building enclosure. Water-resistive barriers are combined with flashing and other materials to ensure that there is a shingled assembly to direct liquid water which passes on the cladding system to the exterior. Also known as a weather-resistive barrier.

**WATER VAPOR PERMEABILITY:** *See* PERMEABILITY; WATER VAPOR.

**WATER VAPOR PERMEANCE:** *See* PERMEANCE; WATER VAPOR.

**WATER VAPOR TRANSMISSION:** The migration of water vapor.

**WATER VAPOR TRANSMISSION RATE:** The rate at which water vapor will diffuse through a unit area of material. Units are usually grains/ft<sup>2</sup>•hr.

**WEATHER-RESISTIVE BARRIER:** *See* WATER-RESISTANT BARRIER.

**WET-BULB TEMPERATURE:** The temperature of air as registered by a thermometer whose bulb is covered by a water wetted wick. Units are °C or °F.

**WET-FILM GAUGE:** A gauge for measuring the thickness of wet coating as applied to a flat smooth surface.

**WET-FILM THICKNESS:** The thickness, expressed in mm or mils, of a coating or mastic as applied, but not cured. Compare to DRY-FILM THICKNESS. (*See also* DRY-FILM THICKNESS; MIL.)

**WINDSCREEN:** A device to minimize the effects of wind on coating or polyurethane foam application.

**WIND UPLIFT:** The force caused by the obstructions causing a drop in air pressure deflection of wind at roof edges, roof peaks, or immediately above the roof surface.

**WRB:** *See* WATER-RESISTANT BARRIER.

**WUFI:** A computer-based, one-dimensional model to simulate transient heat and moisture

transfer through building assemblies, developed by the Fraunhofer Institute in Holtzkirchen, Germany. WUFI can be used to predict condensation, moisture accumulation, and mold growth potential in building assemblies. WUFI is an acronym for the German phrase Wärme Und Feuchte Instationär (translation: transient heat and moisture).

## **X**

[No Entries]

## **Y**

[No Entries]

## **Z**

[No Entries]