The NRCA

Roofing and Waterproofing

Manual

Fifth Edition

Includes 2003 and 2006 Updates

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Foreword

The NRCA Roofing and Waterproofing Manual, Fifth Edition is the tenth in a series of publications from the National Roofing Contractors Association (NRCA) intended to provide in-depth technical information concerning the design and installation of quality roof systems.

NRCA published its first manual, titled *A Manual of Roofing Practice*, in 1970. This was NRCA's first reference guide developed by roofing contractors that dealt with good roofing practice. This manual was subsequently revised in 1971, 1973 and 1976. In its original and revised editions, *A Manual of Roofing Practice* primarily addressed roofing practices relating to built-up membrane roof systems.

In 1981, the first edition of the manual with its present title, *The NRCA Roofing and Waterproofing Manual*, was published. This first edition consisted of 442 pages and contained information on built-up membrane and steep-slope roof systems, waterproofing systems, a limited number of construction details and reprints of NRCA's then-current technical bulletins and *Handbook of Accepted Roofing Practice* (HARK). At the time the first edition was published, single-ply membrane roof systems were just beginning to enter the U.S. roofing market and, therefore, little information regarding single-ply membrane roof systems was included in this edition.

An updated version of the first edition of the manual was published in 1983; this updated edition was still referred to as the first edition of the manual. Changes incorporated into the 1983 version of the manual include revised built-up roofing, HARK and glossary sections and inclusion of the new technical bulletins released since the first edition was originally published in 1981.

In 1985, a reformatted, updated and expanded second edition of *The NRCA Roofing and Waterproofing Manual* was published. This edition consisted of 702 pages and provided new detailed information about single-ply and polymer-modified bitumen sheet membrane roof systems, as well as a separate section providing specifications for low-slope membrane roof systems.

In 1989, the third edition of the manual was published. This edition consisted of 726 pages and contained information updated from the second edition.

In 1996, the fourth edition of *The NRCA Roofing and Waterproofing Manual* was published and consisted of a two volume-set containing a total of 1,858 pages. The fourth edition represented a significant change from previous editions in that a vast majority of the text was rewritten. Also several new sections were added including "The NRCA Metal Roofing Manual," "The NRCA Sprayed Polyurethane Foam-based Roofing Manual" and "The NRCA Energy Manual."

Although past editions of the manual are no longer available in print, *A Manual of Roofing Practice, 1971 Edition* and the first, second and third editions of *The NRCA Roofing and Waterproofing Manual* are available from NRCA in a single CD ROM format, titled *The NRCA Roofing and Waterproofing Manual 1970-1995, A 25-Year History*. *The NRCA Roofing and Waterproofing Manual, Fourth Edition* is also available in CD ROM format from NRCA.

The work that was necessary to develop and update the *Manual of Roofing Practice* and *The NRCA Roofing and Waterproofing Manual* was performed predominantly by committees consisting of NRCA-member roofing contractors. In some cases, other NRCA members, including representatives from roofing material manufacturers, were asked to participate by reviewing drafts of sections of the document, and occasionally were appointed as active committee members. NRCA staff assisted by compiling comments from committees and developing successive drafts, and in the editing, design and layout of the publications.

Before the publication of the fourth edition, ad hoc task forces were appointed by the then-current NRCA president for the purpose of developing the manuals. Following the publication of the earlier editions, these ad hoc committees were disbanded until the process of developing the next edition of the manual began. After the fourth edition was published in 1996, NRCA decided to establish a standing committee, the NRCA Manual Update Committee, for the purpose of maintaining the current edition of the manual and developing the next edition.

Development of *The NRCA Roofing and Waterproofing Manual, Fifth Edition* began in 1997. The NRCA Manual Update Committee was responsible for providing the overall direction, content and format for the various sections that would collectively form the fifth edition. Five additional NRCA technical committees were assigned the task of updating individual sections of the manual.

- The Architectural Sheet Metal and Metal Roofing Committee was responsible for updating the metal roofing manual, turning it into the Architectural Sheet Metal and Metal Roofing section.
- The Low-slope Roofing Committee was responsible for revising the Low-slope Membrane Roofing section, Low-slope Membrane Roofing Construction Details and Guide Specifications and Illustrations for Low-slope Membrane Roofing sections.
- The Steep-slope Roofing Committee was responsible for revising the Steep-Slope Roofing section, as well as developing new sections addressing moisture control and construction details for steep-slope roof systems.
- The Spray Polyurethane Foam-based Roofing Committee was responsible for updating the Spray Polyurethane Foam-based Roofing section.
- The Reroofing Manual Committee was responsible for developing an entirely new section, the Reroofing section.

NRCA's Technical Operations Committee and Executive Committee also assisted in manual development process by reviewing all text, figures and construction details incorporated into *The NRCA Roofing and Waterproofing Manual, Fifth Edition*.

From 1998 through late 2000, each of the committees involved in manual development met on approximately a six-week cycle to develop, review and revise the various drafts of the sections for which they were responsible. The collective effort that was required and the number of volunteer hours that were spent to develop the fifth edition is overwhelming. In total, 66 volunteer committee members participated in various stages of development of *The NRCA Roofing and Waterproofing Manual, Fifth Edition*. Each of theses individuals spent many long hours away from their own businesses in order to contribute their experiences and expertise to the roofing industry. NRCA would like to acknowledge the tremendous efforts and sacrifices that these volunteers made to the publication of *The NRCA Roofing and Waterproofing Manual, Fifth Edition*. The committee members who contributed their expertise and time are listed as follows.

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The NRCA

Glossary

Manual

Fifth Edition

Abrasion resistance: the ability to resist being worn away by contact with another moving, abrasive surface, such as foot traffic, mechanical equipment, wind-blown particles, etc.

Absorption: the ability of a material to accept within its body, quantities of gases or liquid, such as moisture.

Accelerated weathering: the exposure of a specimen to a specified test environment for a specified time with the intent of producing in a shorter time period, effects similar to actual weathering.

Acid etch: in waterproofing, the use of a strong acid to remove the surface of concrete to expose the aggregate.

Acrylic coating: a liquid coating system based on an acrylic resin. Generally, a latex-based coating system that cures by air drying.

Acrylic resin: polymers of acrylic or methacrylic monomers. Often used as a latex base for coating systems.

Active metal (anodic): a metal or material that readily gives up electrons to a cathodic (noble) material. (See anodic). An active metal will corrode in the presence of moisture when in contact with a cathodic metal.

Adhesion: steady or firm attachment.

Adhesive bond break: a material to facilitate independent movement between two units that would otherwise bond together.

Aggregate: (1) crushed stone, crushed slag or water-worn gravel used for surfacing a built-up roof system; (2) any granular material.

Aged R-value: thermal resistance value established by utilizing artificial conditioning procedures for a prescribed time period.

Air leakage: the unintended movement of air from a location where it is intended to be contained to another location.

Alligatoring: the cracking of the surfacing bitumen on a bituminous roof or coating on a SPF roof, producing a pattern of cracks similar to an alligator's hide; the cracks may not extend completely through the surfacing bitumen or coating.

Aluminized steel: sheet steel with a thin aluminum coating bonded to the surface to enhance weathering characteristics.

Aluminum: a nonrusting, malleable metal sometimes used for metal roofing and flashing.

Anodic: a metal or material that readily gives up electrons to a cathodic material in the presence of an electrolyte (see Galvanic series).

ANSI: American National Standards Institute.

Anticapillary hem: a hem used in a metal panel seam to reduce the potential for water migration.

APA: American Plywood Association.

APC: American Plastics Council.

APP: see Atactic polypropylene.

Application rate: the average quantity (mass, volume or thickness) of material applied per unit area.

Apron flashing: a term used for a flashing located at the juncture of the top of a sloped roof and a vertical wall, chimney or steeper-sloped roof.

APC/SPFA: American Plastics Council/Spray Polyurethane Foam Alliance.

Architectural panel: a metal roof panel, typically a double standing seam or batten seam; usually requires solid decking underneath and relies on slope to shed water.

Architectural shingle: an asphalt shingle that provides a dimensional appearance.

Area divider: a raised, flashed assembly, typically a single- or double-wood member attached to a wood base plate, that is anchored to the roof deck. It is used to accommodate thermal stresses in a roof system where an expansion joint is not required, or to separate large roof areas or separate roof systems comprised of different/incompatible materials, and may be used to facilitate installation of tapered insulation.

ARMA: Asphalt Roofing Manufacturers Association.

Area practices: design or application techniques peculiar to a specific geographical region.

Asbestos: a group of natural, fibrous, impure silicate materials.

ASHRAE: American Society of Heating, Refrigerating and Air-Conditioning Engineers.

Asphalt: a dark brown or black substance found in a natural state or, more commonly, left as a residue after evaporating or otherwise processing crude oil or petroleum. Asphalt may be further refined to conform to various roofing grade specifications:

Dead-level asphalt: a roofing asphalt conforming to the requirements of ASTM Specification D 312, Type I.

Flat asphalt: a roofing asphalt conforming to the requirements of ASTM Specification D 312, Type II.

Steep asphalt: a roofing asphalt conforming to the requirements of ASTM Specification D 312, Type III.

Special steep asphalt: a roofing asphalt conforming to the requirements of ASTM Specification D 312, Type IV.

Asphalt, Air blown: asphalt produced by blowing air through molten asphalt to raise its softening point and modify other properties.

Asphalt emulsion: a mixture of asphalt particles and emulsifying agent, such as bentonite clay and water.

Asphalt felt: an asphalt-saturated and/or asphalt-coated felt (see Felt).

Asphalt primer: see Primer.

Asphalt roof cement: a trowelable mixture of solvent-based bitumen, mineral stabilizers, other fibers and/or fillers. Classified by ASTM Standard D 2822-1 Asphalt Roof Cement, and D 4586-2 Asphalt Roof Cement, Asbestos-Free, Types I and II.

Type I is sometimes referred to as “plastic cement,” and is made from asphalt characterized as self-sealing, adhesive and ductile, and conforming to ASTM Specification D 312, Type I; Specification D 449, Types I or II; or Specification D 946 (see Plastic cement and Flashing cement.)

Type II is generally referred to as “vertical-grade flashing cement,” and is made from asphalt characterized by a high softening point and relatively low ductility, and conforming to the requirement of ASTM Specification D 312, Types II or III; or Specification D 449, Type III. (see Plastic cement and Flashing cement.)

Asphalt shingle: a shingle manufactured by coating a reinforcing material (felt or fibrous glass mat) with asphalt and having mineral granules on the side exposed to the weather. (see Shingle)

Asphaltene: a high molecular weight hydrocarbon fraction precipitated from asphalt by a designated solvent (paraffinic naphtha) at a specified temperature and solvent-asphalt ratio.

ASTM: American Society for Testing and Materials.

Atactic polypropylene: a group of high molecular weight polymers formed by the polymerization of propylene.

Attic: the cavity or open space above the ceiling and immediately under the roof deck of a steep-sloped roof.

Back-nailing (also referred to as "Blind-nailing"): the practice of blind nailing the back portion of a roofing ply, steep roofing unit, or other components in a manner so that the fasteners are covered by the next sequential ply, or course, and are not exposed to the weather in the finished roof system

Ballast: a material, such as aggregate or precast concrete pavers, which employs its mass and the force of gravity to hold (or assist in holding) single-ply roof membranes in place.

Bar joist: (see Steel joist).

Barrel vault: a building profile featuring a rounded profile to the roof on the short axis, but with no angle change on a cut along the long axis.

Barrier board: noncombustible board stock material of low thermal conductivity placed between two elements of a roof assembly.

Base flashing (membrane base flashing): plies or strips of roof membrane material used to close-off and/or seal a roof at the horizontal-to-vertical intersections, such as at a roof-to-wall juncture. Membrane base flashing covers the edge of the field membrane. (see Flashing.)

Base ply: the bottom or first ply in a built-up roof membrane when additional plies are to be subsequently installed.

Base sheet: an impregnated, saturated, or coated felt placed as the first ply in some low-slope roof systems.

Batten: (1) cap or cover; (2) in a metal roof, a metal closure set over, or covering the joint between, adjacent metal panels; (3) in a wood roof, a strip of wood usually set in or over the structural deck, used to elevate and/or attach a primary roof covering such as tile; (4) in a single ply membrane roof system, a narrow plastic, wood or metal bar that is used to fasten or hold the roof membrane and/or base flashing in place.

Batten seam: a metal panel profile attached to and formed around a beveled wood or metal batten.

Bentonite: a porous clay formed by the decomposition of volcanic ash that swells 5 to 6 times its original volume in the presence of water.

Bermuda seam: a metal panel profile featuring a step-down profile that runs perpendicular to the slope of the roof.

Bird bath: random, inconsequential amounts of residual water on a roof membrane.

Bitumen: (1) a class of amorphous, black or dark colored, (solid, semi-solid or viscous) cementitious substances, natural or manufactured, composed principally of high molecular weight hydrocarbons, soluble in carbon disulfide, and found in asphalts, tars, pitches and asphaltenes; (2) a generic term used to denote any material composed principally of bitumen, typically asphalt or coal tar.

Bitumen-stop: see Envelope or Bleed-sheet.

Bituminous emulsion: a suspension of minute particles of bituminous material in water.

Blackberry (also referred to as "Blueberry" or "Tar-boil"): a small bubble or blister in the flood coat of an aggregate-surfaced built-up roof membrane.

Blanket (batt) insulation: glass fiber or other compressible fibrous insulation, generally available in roll form.

Bleed-sheet: a sheet material used to prevent the migration of bitumen.

Bleeder strip: (see Rake-starter).

Blind-nailing: the use of nails that are not exposed to the weather in the finished roofing system.

Blister: an enclosed pocket of air, which may be mixed with water or solvent vapor, trapped between impermeable layers of felt or membrane, or between the membrane and substrate.

Blocking: sections of wood (which may be preservative treated) built into a roof assembly, usually attached above the deck and below the membrane or flashing, used to stiffen the deck around an opening, act as a stop for insulation, support a curb, or serve as a nailer for attachment of the membrane and/or flashing.

Blowing agent: an expanding agent used to produce a gas by chemical or thermal action, or both, in manufacture of hollow or cellular materials.

BOCA: Building Officials and Code Administrators, International, Inc.

Bond: the adhesive and/or cohesive forces holding two components in positive contact.

Boot: (1) a covering made of flexible material, which may be preformed to a particular shape, used to exclude dust, dirt, moisture, etc., from around a penetration; (2) a flexible material used to form a closure, sometimes installed at inside and outside corners.

Brake: hand- or power-activated machinery used to bend metal.

Bridging: (1) when membrane or base flashing is unsupported at a juncture; (2) bridging in steep-slope roofing occurs when reroofing over standard-sized asphalt shingles with metric-sized asphalt shingles.

British thermal unit (BTU): the heat energy required to raise the temperature of 1 pound of water degree Fahrenheit (joule). For the metric equivalent, see Joule.

Broadcast: uniformly cast or distribute granular or aggregate surfacing material.

Brooming: to improve the embedding of a ply or membrane by using a broom or squeegee to smooth it out and ensure contact with the adhesive under the ply or membrane.

Buckle: an upward, elongated displacement of a roof membrane frequently occurring over insulation or deck joints. A buckle may be an indication of movement within the roof assembly.

Building code: The minimum construction requirements established generally by national organizations of experts and adopted completely or in altered form by local governing authorities.

Built-up roof (BUR): a continuous, semi-flexible roof membrane, consisting of multiple plies of saturated felts, coated felts, fabrics or mats assembled in place with alternate layers of bitumen, and surfaced with mineral aggregate, bituminous materials, a liquid-applied coating or a granule-surfaced cap sheet.

Bundle: an individual package of shakes or shingles.

Bun stock: large solid box-like structure formed during the production of polystyrene insulation; individual board stock pieces are then cut from the bun.

Butt joint: a joint formed by adjacent, separate sections of material, such as where two neighboring pieces of insulation abut.

Button punch: a process of indenting two or more thicknesses of metal that are pressed against each other to prevent slippage between the metal.

Butyl: rubber-like material produced by polymerizing isobutylene.

Butyl coating: an elastomeric coating system derived from polymerized isobutylene. Butyl coatings are characterized by low water vapor permeability.

Butyl rubber: a synthetic elastomer based on isobutylene and a minor amount of isoprene. It can be vulcanized and features low permeability to gases and water vapor.

Butyl tape: a sealant tape sometimes used between metal roof panel seams and/or end laps; also used to seal other types of sheet metal joints, and in various sealant applications.

Calender: (1) to press between rollers or plates in order to smooth and glaze or to thin into sheets; (2) a machine for calendering.

Camber: a slight convexity, arching or curvature (as of a beam, roof deck or road).

Canopy: any overhanging or projecting roof structure, typically over entrances or doors.

Cant: in SPF-based roofing, a beveling of foam at horizontal/vertical joints to increase strength and promote water run off.

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: (1) usually composed of metal, used to cover or shield the upper edges of the membrane base flashing wall flashing; (2) a flashing used to cover the top of various buildings components, such as parapets or columns. (see Flashing and Coping.)

Cap sheet: a sheet, often granule-surfaced, used as the top ply of some built-up or modified bitumen roof membranes and/or flashings.

Capacitance meter: a device used to locate 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 non-conductor.

Capillary action: (1) the action by which the surface of a liquid where it is in contact with a solid is elevated or depressed depending on the relative attraction of the molecules of the liquid for each other and for those of the solid; (2) the siphoning of liquid into a joint or void between two adjacent surfaces.

Catalyst: an ingredient that initiates a chemical reaction or increases the rate of a chemical reaction when combined with another chemical.

Cathodic: A metal or material that readily attracts electrons from an anodic material in the presence of an electrolyte (see Galvanic Series).

Caulk: a composition of vehicle and pigment used at ambient temperatures for filling/sealing joints or junctures, that remains elastic for an extended period of time after application.

Caulking: (1) the physical process of sealing a joint or juncture; (2) sealing and making weather-tight the joints, seams or voids between adjacent surfaces by filling with a sealant.

Cavitation: the formation of a partial vacuum or cavity in a liquid.

Cavity wall: an exterior wall usually of masonry, consisting of an outer and inner withe separated by a continuous air space, but connected together by wire or sheet-metal tiles.

C-channel: a structural framing member.

Cellular glass insulation: A rigid closed-cell insulation board made from crushed glass and hydrogen sulfide gas.

Cementitious waterproofing: heavy cement-based compounds and various additives that are mixed and packaged for use in a dry form; the packaged mixture is then mixed with water and liquid bonding agents to a workable concrete-like consistency.

Centipoise: a unit of measure of absolute viscosity. (The viscosity of water is one centipoise. The lower the number, the less viscous the material.)

Centistoke: a unit of viscosity; the ratio of a liquid's absolute viscosity to the density of that liquid.

CERL: Construction Engineering Research Laboratory.

Chalk: a powdery residue on the surface of a material.

Chalk line: a line made on the roof or other flat surface by snapping a taut string or cord dusted with colored chalk.

Chalking: the formation of a powdery surface condition from the disintegration of a binder or elastomer.

Channel flashing: in steep-slope roof construction, a type of flashing used at roof-to-wall junctures and other roof-to-vertical plane intersections where an internal gutter is needed to handle runoff. Commonly used with profile tile.

Chemical resistance: the ability to withstand contact with specified chemicals without a significant change in properties.

Chimney: stone, masonry, prefabricated metal or wood-framed structure, containing one or more flues, projecting through and above the roof.

Chlorinated polyethylene (CPE): a thermoplastic material, used for single-ply roof membranes, composed of high molecular weight polyethylene that has been chlorinated with a process that yields a flexible rubber-like material.

Chlorosulfonated polyethylene (CSPE or CSM): probably best known by the DuPont trade name Hypalon™, a synthetic, rubber-like thermoset material, based on high molecular weight polyethylene with sulphonyl chloride, usually formulated to produce a self-vulcanizing membrane. Classified by ASTM Standard D 5019.

Cladding: a material used as the exterior wall enclosure of a building.

Cleat: a continuous metal strip, or angled piece, used to secure metal components (also see Clip).

Clerestory: an upward extension of enclosed space created by carrying a setback vertical, wall (typically glazed) up and through the roof slope. Two intersecting shed roofs on different planes.

Clip: A non-continuous metal component or angle piece used to secure two or more metal components together. (see Cleat.)

Clipped gable: a gable cutback near the peak in a hip-roof form.

Closed-cut valley: a method of valley application in which shingles from one side of the valley extend across the valley while shingles from the other side are trimmed back approximately 2 inches (51 mm) from the valley centerline.

Closure strip: a metal or resilient strip, such as neoprene foam, used to close openings created by joining metal panels or sheets and flashings.

Coal tar: a dark brown to black colored, semi-solid hydrocarbon produced by the distillation of coal. Coal tar pitch is further refined to conform to the following roofing grade specifications:

> **Coal tar pitch:** a coal tar used as the waterproofing agent in dead-level or low-slope built-up roof membranes and membrane waterproofing systems, conforming to ASTM Specification D 450, Type I.
>
> **Coal tar waterproofing pitch:** a coal tar used as the dampproofing or waterproofing agent in below-grade structures, conforming to ASTM Specification D 450, Type II.
>
> **Coal tar bitumen:** a proprietary trade name for Type III coal tar used as the dampproofing or waterproofing agent in dead-level or low-slope built-up roof membranes and membrane waterproofing systems, conforming to ASTM D 450, Type III.

Coal tar felt: a felt that has been saturated or impregnated with refined coal tar.

Coal tar roof cement: a trowelable mixture of processed coal tar base, solvents, mineral fillers and/or fibers. Classified by ASTM Standard D 4022, “Coal Tar Roof Cement, Asbestos Container.”

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.

Coated base sheet: a coated felt intended to be used as a base ply in a built-up or modified bitumen roof membrane.

Coated fabric: fabrics that have been impregnated and/or coated with a plastic like material in the form of a solution, dispersion hot-melt or powder. The term also applies to materials resulting from the application of a preformed film to a fabric by means of calendering.

Coated felt (Sheet): (1) an asphalt felt that has been coated on both sides with harder, more viscous asphalt; (2) a glass fiber felt that has been simultaneously impregnated and coated with asphalt on both sides.

Coating: a layer of liquid material applied to a surface for protection or appearance.

Cobwebbing: a phenomenon observed during spray application characterized by the formation of web-like threads along with the usual droplets leaving the spray gun nozzle.

Code: a collection of laws (regulations, ordinances or statutory requirements) adopted by governmental authority. (see Building code and Model code.)

Coefficient of thermal expansion: the coefficient of change in dimension of a material per unit of dimension per degree change in temperature.

Cohesion: the molecular forces of attraction by which the body of a material is held together.

Coil coating: the application of a finish to a coil of metal using a continuous mechanical coating process.

Cold forming: the process of shaping metal into desired profiles without the application of heat.

Cold rolled: the process of forming steel into sheets, panels, or shapes on a series of rollers at room temperature.

Cold roof assembly: a roof assembly configured with the insulation below the deck, not typically in contact with the deck, allowing for a ventilation space. The temperature of the roof assembly remains close to the outside air temperature.

Color stability: the ability of a material to retain its original color after exposure to weather.

Column: in structures, a relatively long, slender structural compression member such as a post, pillar or strut; usually vertical which acts in (or near) the direction of its longitudinal axis.

Combing ridge: a term used to describe an installation of finishing slate or wood at the ridge of a roof whereby the slates on one side project beyond to the apex of the ridge.

Combustible: capable of burning.

Combustion: a chemical process of oxidation that occurs at a rate fast enough to produce heat and usually light either as glow or flames; the process of burning.

Compatible materials: two or more substances that can be mixed, blended, or attached without separating, reacting, or affecting the materials adversely.

Composition shingle: a unit of asphalt shingle roofing.

Composite board roof insulation: rigid board insulation generally comprised of perlite or wood fiberboard factory bonded to polyisocyanurate or polystyrene.

Compounded thermoplastics: a category of roofing membranes made by blending thermoplastic resins with plasticizers, various modifiers, stabilizers, flame retardants, UV absorbers, fungicides and other proprietary substances alloyed with proprietary organic polymers.

Compressive strength: the property of a material that relates to its ability to resist compression loads.

Concealed-nail method: a method roofing application in which all nails are driven into the underlying course of roofing and covered by a subsequent, overlapping course.

Concealed plate: see Cover plate.

Condense: to make denser or more compact, as when a material (e.g., water vapor) changes from its gas phase to its liquid phase.

Condensate: the liquid resulting from the condensation of a gas.

Condensation: the conversion of water vapor or other gas to liquid phase as the temperature drops; the act or process of condensing.

Conditioning: the storage of a material specimen under specified temperature, humidity, etc. for a specified time prior to testing.

Conductance, Thermal: the thermal transmission in unit time through unit area of a particular body or assembly having defined surfaces, when unit average temperature difference is established between the surfaces. C=Btu/h·ft^2·°F (C=W/m^2·K).

Conductor head: an enlargement or catch basin at the top of a downspout or leader to receive rainwater from a gutter or scupper.

Construction joint: (1) a joint where two successive placements of concrete meet; (2) a separation provided in a building which allows its component parts to move with respect to each other.

Contact cements: adhesives used to adhere or bond various roofing components. These adhesives adhere mated components immediately on contact of surfaces to which the adhesive has been applied.

Contamination: the process of making a material or surface unclean or unsuited for its intended purpose, usually by the addition or attachment of undesirable foreign substances.

Control joint: a groove which is formed, sawed, or tooled in a concrete or masonry structure to regulate the location and amount of cracking and separation resulting from the dimensional change of different parts of the structure, thereby avoiding the development of high stresses.

Coping: the covering piece on top of a wall exposed to the weather, usually made of metal, masonry, or stone and sloped to carry off water.

Copolymer: the product of polymerization of two or more substances (as two different isomers) together.

Copolymerization: a chemical reaction that results in the bonding of two or more dissimilar monomers to produce large, long-chain molecules that are copolymers.

Copper: a natural weathering metal used in metal roofing or flashing; typically used in 16 ounce per square foot (0.56 mm) and 20 ounce per square foot (0.69 mm) thicknesses.

Core cut or core sample: (1) a sample from a low-slope roof system taken for the purpose of obtaining primarily qualitative information about its construction. Typically, core cut analysis can verify or reveal the type of membrane surfacing; the type of membrane; the approximate number of plies; the type, thickness and condition of the insulation (if any); and the type of deck used as a substrate for the roof system. (2) for in SPF-based roof systems, core cuts are used to obtain both quantitative and qualitative information, such as the thickness of the foam, the thickness and adhesion of the coating, thickness of individual passes and adhesion between passes and the adhesion of the foam to its substrate.

Cornice: the decorative horizontal molding or projected roof overhang.

Counter batten: vertical wood strips installed on sloped roofs over which horizontal battens are secured. The primary roof covering is attached or secured to these horizontal battens.

Counterflashing: formed metal or elastomeric sheeting secured on or into a wall, curb, pipe, rooftop unit or other surface, to cover and protect the upper edge of a base flashing and its associated fasteners.

Course: (1) the term used for a row of roofing material that forms the roofing, waterproofing or flashing system; (2) one layer of a series of materials applied to a surface (e.g., a five-course wall flashing is composed of three applications of roof cement with one ply of felt or fabric sandwiched between two layers of roof cement).

Cover board: an insulation board used over closed cell plastic foam insulation (e.g., polyisocyanurate) to prevent blistering when used in conjunction with hot bituminous membranes. Suitable cover board insulation are glass-faced siliconized gypsum board, glass-fiber board, perlite board, wood-fiber board or mineral-fiber board. Cover boards are also recommended between polyisocyanurate insulation and single ply membranes to protect the polyisocyanurate.

Cover plate: a metal strip sometimes installed over or under the joint between formed metal pieces.

Coverage: the surface area uniformly covered by a specific quantity of a particular material at a specific thickness.

CPA: copolymer alloy.

Crack: a nonlinear separation or fracture occurring in a material.

Cream time: time in seconds (at a given temperature) when the A and B components of polyurethane foam will begin to expand after being mixed. Recognizable as a change in color of the materials.

Cricket: a relatively small area of a roof constructed to divert water from a horizontal intersection of the roof with a chimney, wall, expansion joint or other projection. (see Saddle.)

Cross-linking: the formation of chemical bonds between polymeric chains. Cross-linking of rubber is referred to as vulcanization or "curing."

CRREL: Cold Regions Research and Engineering Laboratory.

Crystalline waterproofing: a compound of cement, quartz or silica sand, and other active chemicals that are mixed and packaged for use in a dry powder form; the packaged mixture is then mixed with water and applied to a concrete surface where it penetrates into the pores of concrete.

CSPE: chlorosulfonated polyethylene.

Cupola: a relatively small roofed structure, generally set on the ridge or peak of a main roof area for ventilation or aesthetic purposes.

Curb: (1) a raised member used to support roof penetrations, such as skylights, mechanical equipment, hatches, etc. above the level of the roof surface; (2) a raised roof perimeter relatively low in height.

Cure: a process whereby a material is caused to form permanent molecular linkages by exposure to chemicals, heat, pressure and/or weathering.

Cure time: the time required for a material to reach its desirable long-term physical characteristics.

Cured concrete: concrete that has attained its intended design performance properties.

Curing agent: an additive in a coating or adhesive that results in increased chemical activity between the components with an increase or decrease in rate of cure.

Curing compound: a liquid that is sprayed or otherwise applied to newly placed concrete which retards the loss of water during curing.

Cutback: solvent-thinned bitumen used in cold-process roofing adhesives, roof cements and roof coatings.

Cutoff: a permanent detail designed to prevent lateral water movement in an insulation system and used to isolate sections of a roofing system. (Note: A cutoff is different from a tie-in, which may be a temporary or permanent seal.) (see Tie-In.)

Cutout: the open portions of a strip shingle between the tabs. Sometimes referred to as a keyway.

Dampproofing: treatment of a surface or structure to resist the passage of water in the absence of hydrostatic pressure.

Dead level: absolutely horizontal or zero slope. (see Slope.)

Dead-level asphalt: see Asphalt.

Dead loads: the weight of a structure itself, including the weight of fixtures or equipment permanently attached to it.

Deck: a structural component of the roof of a building. The deck must be capable of safely supporting the design dead and live loads, including the weight of the roof systems, and the additional live loads required by the governing building codes and provide the substrate to which the roofing or waterproofing system is applied the structural surface of a building to which a roof assembly is installed. Decks are either non-combustible (e.g., corrugated metal, concrete, or gypsum) or combustible (e.g., wood plank or plywood).

Deflection (bowing, sagging): (1) the deformation of a structural member as a result of loads acting on it; (2) any displacement in a body from its static position, or from an established direction or plane, as a result of forces acting on the body.

Degradation: a deleterious change in the chemical structure, physical properties or appearance of a material from natural or artificial exposure (e.g., exposure to radiation, moisture, heat, freezing, wind, ozone, oxygen, etc.).

Degree days: a unit used in estimating the fuel consumption for a building; equal to the number of degrees that the mean temperature, for a 24-hour day, is below the "base temperature"; the base temperature is taken as 65° F (18.3° C) in the U.S.A.

Delamination: separation of the laminated layers of a component or system.

Design loads: the total load on a structural system for the most severe combination of loads and forces which it is designed to sustain.

Dew-point temperature: the temperature at which air becomes saturated with water vapor. The temperature at which air has a relative humidity of 100%.

Diaphragm: a floor slab, metal wall panel, roof panel, or the like, having a sufficiently large in-plane shear stiffness and sufficient strength to transmit horizontal forces to resisting systems.

Diffusion: the movement of water vapor from regions of high concentration (high water vapor pressure) toward regions of lower concentration.

Dimensional shingle: a shingle that is textured, overlayed, or laminated and designed to produce a three-dimensional effect. (also see Laminated shingle and Architectural shingle.)

Dimensional stability: the degree to which a material maintains its original dimensions when subjected to changes in temperature and humidity.

DOE: U.S. Department of Energy.

Dormer: a structure projecting from a sloping roof usually housing a window or ventilating louver.

Double coverage: application of asphalt, slate, or wood roofing such that the lapped portion is at least 2 inches (50 mm) wider than the exposed portion, resulting in two layers of roofing material over the deck.

Double lock standing seam: in a metal roof panel or metal cap, a standing seam that uses a double overlapping interlock between two metal panels. (see Standing seam.)

Double pour: to apply two layers or flood coats of bitumen and aggregate to a built-up roof.

Downspout: a vertical pipe or conduit used to carry runoff water from a scupper, conductor head or gutter of a building to a lower roof level or to the ground or storm water runoff system.

Drag load: the external force (e.g., from the weight of ice and snow) applied to a steep-slope roof system component forcing the component downslope.

Drain: an outlet or other device used to collect and direct the flow of runoff water from a roof area.

Drip edge: a metal flashing or other overhanging component with an outward projecting lower edge, intended to control the direction of dripping water and help protect underlying building components.

Dry: free or relatively free from a liquid, especially water; (2) to remove water or moisture.

Dry bulb temperature: the temperature of air as measured by an ordinary thermometer.

Dry film thickness: the thickness, expressed in mils, of an applied and cured coating or mastic. For comparison, see Wet film thickness.

Drying time: the time required for the loss of volatile components so that the material will no longer be adversely affected by weather conditions such as dew, rain, or freezing.

Dual level drain: in waterproofing, an outlet or other device with provisions for drainage at both the wearing surface and waterproofing membrane levels used to collect and direct the flow of runoff water from a horizontal slab.

Dynamic load: any load which is nonstatic, such as a wind load or moving live load.

Eave: the lower edge of a sloping roof that part of a roof which projects beyond the wall.

Eave height: the vertical dimension from finished grade to the eave.

Eave-trough: see Gutter.

ECH: polyepichlorohydrin, commonly referred to as epichlorohydrin. (see Epichlorohydrin.)

Edge stripping: membrane flashing strips cut to specific widths used to seal/flash perimeter edge metal and the roof membrane application of felt strips cut to narrower widths than the normal felt-roll width to cover a joint between metal perimeter flashing and built-up roofing.

Edge venting: the practice of providing regularly spaced or continuously protected (e.g., louvered) openings along a roof edge or perimeter, used as part of a ventilation system to dissipate heat and moisture vapor.

Efflorescence: an encrustation of soluble salts, commonly white, deposited on the surface of stone, brick, plaster, or mortar; usually caused by free alkalies leached from mortar or adjacent concrete as moisture moves through it.

EIP: ethylene interpolymer.

Elasticity: the property of a body that causes it to tend to return to its original shape after deformation (as stretching, compression or torsion).

Elastomer: a macromolecular material that returns rapidly to its approximate initial dimensions and shape after substantial deformation by a weak stress and subsequent release of that stress.

Elastomeric coating: a coating that is capable of being stretched at least twice its original length (100 percent elongation) and recovering to its original dimensions.

Elongation: the ratio of the extension of a material to the length of the material prior to stretching.

Embedment: (1) the process of pressing/positioning a felt, aggregate, fabric, mat, or panel into hot bitumen or adhesive to ensure intimate contact at all points; (2) the process of pressing/positioning granules into coating in the manufacture of factory-prepared roofing, such as shingles.

Embrittlement: the loss of flexibility or elasticity of a material.

Emulsion: A mixture of bitumen and water, with uniform dispersion of the bitumen or water globules, usually stabilized by an emulsifying agent or system.

End lap: the distance of overlap where one ply, pane, or piece extends beyond the end of the immediately adjacent underlying ply, panel, or piece.

Envelope (Bitumen-stop): a continuous membrane edge seal formed at the perimeter and at penetrations by folding the base sheet or ply over the plies above and securing it to the top of the membrane. The envelope prevents bitumen seepage from the edge of the membrane.

EPDM: Ethylene propylene diene monomer (see also Ethylene propylene diene terpolymer.)

Epichlorohydrin (ECH): a synthetic rubber including two epichlorohydrin based elastomers. It is similar to and compatible with EPDM.

Epoxy: a class of synthetic, thermosetting resins that produce tough, hard, chemical-resistant coatings and adhesives.

Equilibrium moisture content (EMC): (1) the moisture content of a material stabilized at a given temperature and relative humidity, expressed as percent moisture by weight.

Equiviscous temperature (EVT): the temperature at which a bitumen attains the proper viscosity for built-up membrane application.

Equiviscous temperature (EVT) application range: the recommended bitumen application temperature range. The range is approximately 25° F (14° C) above or below the EVT, thus giving a range of approximately 50° F (28° C). The EVT range temperature is measured in the mop cart or mechanical spreader just prior to application of the bitumen to the substrate.

Equiviscous temperature (EVT) for asphalt: the recommended EVT for roofing asphalt (ASTM D 312, Type I, II, III or IV) is as follows:

Mop application: the temperature at which the asphalt's apparent viscosity is 125 centipoise (0.125 Pa·s).

Mechanical spreader application: the temperature at which the asphalt's apparent viscosity is 75 centipoise (0.075 Pa·s).

Note: In order to avoid the use of two kettles if there are simultaneous mop and mechanical spreader applications, the EVT for mechanical spreader application can be used for both application techniques.

Equiviscous temperature (EVT) for coal tar: the recommended EVT for roofing coal tar (ASTM D 450, Type I or III) is the temperature at which the coal tar's apparent viscosity is 25 centipoise (0.025 Pa·s).

Ethylene interpolymers (EIP): a group of thermoplastic compounds generally based on PVC polymers from which certain single-ply roofing membranes can be formulated.

Ethylene propylene diene terpolymer (EPDM): designated nomenclature of ASTM for a terpolymer of ethylene, propylene and diene. EPDM material is a thermosetting synthetic elastomer.

EVT: Equiviscous temperature.

Exhaust ventilation: air that is vented or exhausted from the roof cavity, typically through vents installed on the up slope portion of the roof. For example, with most steep-slope roof assemblies, exhaust vents are typically located at or near the ridge.

Exotherm: heat generated by a chemical reaction.

Expansion cleat: a cleat designed to accommodate thermal movement of metal roof panels.

Expansion joint: a structural separation between two building elements that allows free movement between the elements without damage to the roofing or waterproofing system.

Exposed-nail method: a method of asphalt roll roofing application in which all nails are driven into the adhered, overlapping course of roofing. Nails are exposed to the weather.

Exposure: (1) the traverse dimension of a roofing element or component not overlapped by an adjacent element or component in a roof covering. For example, the exposure of any ply in a built-up roof membrane may be computed by dividing the felt width, minus 2 inches (51 mm), by the number of shingled plies; thus, the exposure of 36 inch (914 mm) wide felt in a shingled, four-ply membrane should be approximately 8½ inches (216 mm) (See Figure 8); (2) the dimension of sidewall or roofing covering that is not covered or overlapped by the up slope course of component. The typical exposure for a standard-sized, three-tab shingle is 5 inches (127 mm), depending on manufacturer specifications.

Extrusion: a process in which heated or unheated material is forced through a shaping orifice (a die) in one continuously formed shape, as in film, sheet, rod or tubing.

Eyebrow: a dormer, usually of small size, whose roof line over the upright face is typically an arched curve, turning into a reverse curve to meet the horizontal at either end. Also, a small shed roof projecting from the gable end of the larger, main roof area.

Fabric: a woven cloth or material of organic or inorganic filaments, threads, or yarns used for reinforcement in certain membranes and flashings.

Factory Mutual Research (FMR): commonly referred to as "FM," a research and testing organization that classifies roofing components and assemblies for their fire, traffic, impact (hail), weathering, and wind-uplift resistance for four major insurance companies in the United States.

Factory seam: a splice/seam made by the manufacturer during the assembly of sections of materials into larger sheets/panels.

Fading: any lightening of initial color.

Fallback: a reduction in bitumen softening point, sometimes caused by refluxing or overheating in a relatively closed container. (see Softening Point Drift.)

Fascia: (1) in steep-slope roofing, a board that is nailed to the ends of a roof rafter; sometimes supports a gutter; (2) in low-slope roofing, the vertical or steeply sloped roof or trim located at the perimeter of a building. Typically, it is a border for the low-slope roof system.

Fastener: any of a wide variety of mechanical securement devices and assemblies, including nails, staples, screws, cleats, clips and bolts, which may be used to secure various components of a roof assembly.

Feathering strips: tapered wood filler strips placed along the butt ends of old wood shingles to create a relatively smooth surface when reroofing over existing wood shingle roofs. Referred to in some regions of the country as "horse feathers," or leveling strips.

Felt: a flexible sheet manufactured by the interlocking of fibers with a binder or through a combination of mechanical work, moisture and heat. Felts are manufactured principally from wood pulp and vegetable fibers (organic felts), asbestos fibers (asbestos felts), glass fibers (glass fiber felts or ply sheets), or polyester fibers.

Felt machine (Felt Layer): a mechanical device used for applying bitumen and roofing felt or ply sheet simultaneously.

Ferrule: a metal sleeve placed inside a gutter at the top. A spike or screw is nailed/screwed through the gutter face and ferrule into the fascia board to hold the gutter in place. The ferrule acts as a spacer in the gutter to maintain its original shape.

Field seam: a splice or seam made in the field (not factory) where overlapping sheets are joined together using an adhesive, splicing tape, or heat- or solvent-welding.

Filler: a relatively inert ingredient added to modify physical characteristics.

Fillet: a heavy bead of waterproofing compound or sealant material generally installed at the point where vertical and horizontal surfaces meet; to reduce the desired effect to take out the 90° angle at the base of a vertical flashing.

Film: sheeting having a nominal thickness not greater than 10 mils (0.25 mm).

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 mils (thousandths of an inch).

Fin: a term used to describe a deck surface condition. A sharp raised edge (generally in concrete) capable of damaging a roof membrane or vapor retarder.

Fine mineral-surfacing: water-insoluble, inorganic material, more than 50 percent of which passes through a No. 35 sieve. Used on the surface of various roofing materials and membranes to prevent sticking.

Fire resistance: the property of a material or assembly to withstand fire or give protection from it.

Fire retardant treated (FRT) plywood: plywood which has been impregnated, under pressure, with mineral salts; in the event of fire, the burning wood and salts emit noncombustible gases and water vapor instead of the usual flammable vapors.

Fishmouth: (also referred to as an edge wrinkle) (1) 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; (2) in shingles, a half-conical opening formed at a cut edge.

Flaking: in protective coatings, the detachment of small pieces of the coating film.

Flammable: subject to easy ignition and rapid flaming combustion.

Flame retardant: a chemical used to impart flame resistance.

Flame spread: the propagation of a flame away from its source of ignition.

Flammability: those characteristics of a material that pertain to its relative ease of ignition and ability to sustain combustion.

Flange: the projecting edge of a rigid or semi-rigid component, such as a metal edge flashing flange.

Flash point: the lowest temperature at which vapors above a volatile combustible substance ignite in air when exposed to a flame.

Flashing: components used to weatherproof or seal roof system edges at perimeters, penetrations, walls, expansion joints, valley, drains and other places where the roof covering is interrupted or terminated. For example, membrane base flashing covers the edge of the field membrane, and cap flashings or counterflashings shield the upper edges of the base flashing.

Flashing cement: a trowelable mixture of solvent-based bitumen and mineral stabilizers that may include asbestos or other inorganic or organic fibers. Generally, flashing cement is characterized as vertical-grade, which indicates it is intended for use on vertical surfaces. (see Asphalt Roof Cement and Plastic Cement.)

Flashing collar: (sometimes referred to as a roof jack or flashing boot) an accessory flashing used to cover and/or seal soil pipe vents and other penetrations through the roof.

Flat lock: a method of interlocking metal panels in which one panel edge is folded back on top of itself and the other panel is folded under, after which the two panels are hooked together.

Fleece: mats or felts composed of fibers, sometimes used as a membrane backer.

Flood (pour) coat: the surfacing layer of bitumen into which surfacing aggregate is embedded on an aggregate-surfaced built-up roof.

Flood test: the procedure in which a controlled amount of water is temporarily retained over a horizontal surface to determine the effectiveness of the waterproofing system.

Fluid-applied elastomer: a liquid elastomeric material that cures after application to form a continuous waterproofing membrane.

Fly-in: method of application for roll materials by which the dry sheet is set into the bitumen or adhesive applied to the roof surface.

FM: see Factory Mutual Research (FMR).

Foam stop: the roof edge treatment upon which SPF is terminated.

Force: a strength or energy exerted or brought to bear; cause of motion or change.

FPL: Forest Products Laboratory.

Froth pack: a term used to describe small, disposable aerosol cans that contain SPF components. Two component froth packs are available to do small repairs for sprayed polyurethane foam-based roofs.

G-90: a designation for galvanized metal sheet, indicating 0.90 ounces (26 g) of zinc per square foot, measured on both sides.

Gable: the vertical triangular portion of the end of a building having a double-sloping roof, from the level of the eaves to the ridge of the roof.

Gable roof: a single-ridge roof that terminates at gable end(s).

Galvalume: trade name for a metal alloy coating that is composed of aluminum, zinc and silicone.

Galvanic action: an electrochemical action that generates electrical current between two metals of dissimilar electrode potential.

Galvanic series: a list of metals and alloys arranged according to their relative electrolytic potentials in a given environment.

Galvanize: to coat steel or iron with zinc.

Galvanized steel: steel coated with zinc for corrosion resistance.

Gambrel: a roof that has two pitches on each side, where the upper roof area has less slope than the lower roof areas.

Gauge: a metal thickness measurement.

Geocomposite: a prefabricated water drainage material used to relieve hydrostatic pressure against waterproofing and promote drainage.

Geotextile: a tightly woven fabric used to restrict the flow of fine soil particles and other contaminants while allowing water to pass freely through; used to protect drainage systems from clogging.

Girt: a horizontal beam that supports wall cladding between columns.

Glass fiber insulation: blanket or rigid board insulation, composed of glass fibers bound together with a binder, faced or unfaced, used to insulate roofs and walls.

Glass felt: glass fibers bonded into a sheet with resin and suitable for impregnation with asphalt in the manufacture of bituminous waterproofing, roofing membranes and shingles.

Glass mat: a thin mat of glass fibers with or without a binder.

Glaze coat: (1) the top layer of asphalt on a smooth-surfaced built-up roof membrane; (2) a thin protective coating of bitumen applied to the lower plies or top ply of a built-up roof membrane when application of additional felts or the flood coat and aggregate surfacing are delayed. (also see Flood coat.)

Gloss: the shine, sheen or luster of a dried film.

Grain: a unit of measure in the English System of units; 7,000 grains equals 1 lb.; used as a measure of the weight of moisture in air.

Granule: (also referred to as mineral or ceramic granule) opaque, natural or synthetically colored aggregate commonly used to surface cap sheets, shingles, and other granule-surfaced roof coverings.

Gravel: coarse granular aggregate resulting from the natural erosion of rock.

Gravel stop: a flanged device, frequently metallic, designed to prevent loose aggregate from washing off the roof and to provide a continuous finished edge for the roofing.

Groundwater level: at a particular site, the level, below which the subsoil and rock masses of the earth are fully saturated with water.

Grout: a mixture of cement, sand, and water used to fill cracks and cavities in masonry.

Gusset: used at the bottom of a steep-slope roof system valley, a large flat metal piece(s) wider than the valley to help prevent build-up at the base of the valley, either from debris or ice dam formations.

Gutter: a channeled component installed along the downslope perimeter of a roof to convey runoff water from the roof to the drain leaders or downspouts.

Gypsum board panels: cementitious board stock with noncombustible core primarily comprised of gypsum that is commonly used as a barrier board thermal barrier or cover board in a roof assembly.

Hand-tabbing: method of spot applying asphalt-based adhesive to shingles for securement and wind resistance.

Headlap: the distance of overlap measured from the uppermost ply or course to the point where it laps over the undermost ply or course.

Heat flow: the quantity of heat transferred to or from a system in a unit of time.

Heat seaming: the process of joining thermoplastic films, membranes, or sheets by heating and then applying pressure to bring both materials in contact with each other. (see Heat welding.)

Heat transfer: the transmission of thermal energy from a location of higher temperature to a location of lower temperature. This can occur by conduction, convection or radiation.

Heat welding: method of melting and fusing together the overlapping edges of separate sheets or sections of polymer modified bitumen, thermoplastics or some uncured thermoset roofing membranes by the application of heat (in the form of hot air or open flame) and pressure. (see Heat seaming.)

Hem: the edge created by folding metal back on itself.

Hip: the inclined external angle formed by the intersection of two sloping roof planes.

Hip roof: a roof that rises by inclined planes to form one or more hips.

Hoist: a mechanical lifting device.

Holiday: an area where a liquid-applied material is missing or absent.

Honeycomb: voids left in concrete resulting from failure of the mortar to effectively fill the spaces among coarse aggregate particles.

Hot or Hot stuff: a roofing worker's term for hot bitumen.

Hue: the subjective perception of color such as red, yellow, green, blue, purple or some combination; white, black or gray possess no hue.

Humidity: the condition of the atmosphere with respect to water vapor. See relative humidity.

HVAC: heating, ventilating, and air conditioning equipment.

Hybrid roof covering: combination of two or more separate and distinct roof membranes; e.g., three ply smooth BUR and a modified bitumen cap.

Hydration: the chemical reaction by which a substance (such as Portland cement) combines with water, giving off heat to form a crystalline structure in its setting and hardening.

Hydrocarbon: an organic chemical compound primarily containing the elements carbon and hydrogen.

Hydrostatic pressure: the pressure equivalent to that exerted on a surface by a column of water of a given height.

Hydrostatic pressure relief system: a system of perimeter and/or under slab drains used to regulate the hydrostatic pressure in the earth surrounding a below-grade structure.

Hygroscopic: attracting, absorbing and retaining atmospheric moisture.

Hypalon™: a registered trademark of E.I. du Pont de Nemours & Co., for "chlorosulfonated polyethylene" (CSPE). (see Chlorosulfonated polyethylene.)

ICBO: International Conference of Building Officials.

Ice dam: a mass of ice formed at the transition from a warm to a cold roof surface, frequently formed by refreezing meltwater at the overhang of a steep roof, causing ice and water to back up under roofing materials.

Ice dam protection membrane: a continuous membrane installed under steep slope roofing materials in areas subject to ice damming that prohibits water which gets through the roof covering from getting into the structure. Must also seal the fasteners that penetrates it.

Ignition temperature: the lowest temperature at which combustion will occur spontaneously under specific conditions.

Impact resistance: resistance to fracture under the sudden application of an exerted force.

Impregnate: In roofing materials manufacture, to completely surround the fibers in a felt or mat with bitumen, with the spaces between the fibers partially or completely filled without a continuous coating of bitumen on the surface.

Infrared thermography: The process of displaying variations of apparent temperatures (variation of temperature or emissivity or both) over the surface of an object by measuring variations in infrared radiance.

Inorganic: being or composed of materials other than hydrocarbons and their derivatives, or matter that is not of plant or animal origin.

Insect screen: wire mesh used to prevent insects from entering the building through ventilators, louvers, or other openings.

In-service R-value: thermal resistance value established under installed conditions and measured over the expected service life of the material.

Insulation: any of a variety of materials designed to reduce the flow of heat, either from or into a building. (see also Thermal insulation.)

Intake ventilation: the fresh air that is drawn into a passive ventilation system through vents typically installed in the soffit or eave of a roof.

Interlayment: a felt, metal, or membrane sheet material used between courses of steep-slope roofing to improve the weather- and water-shedding characteristics of the primary roof covering during times of wind-driven precipitation. Typically used with wood shakes.

Interlocking shingles: individual shingles that mechanically attach to each other to provide enhanced wind resistance without reliance on sealing strips.

Inverted roof membrane assembly (IRMA™): a patented, proprietary variation of the "protected membrane roof assembly" in which Styrofoam® brand insulation and ballast are placed over the roof membrane. IRMA™ and Styrofoam® are registered trademarks of the Dow Chemical Company.

ISANTA: International Staple, Nail & Tool Association

Isocyanate: a highly reactive organic chemical containing one or more isocyanate (-N=C=0) groups. A basic component in SPF based systems and some polyurethane coating systems.

Isolation sheet: refer to slip sheet.

Joist: any of the small timbers, metal or wood beams arranged parallel to each other and spanning from wall to wall to support a floor, ceiling, or roof of a building.

Joule: a unit of energy or work; equals the work done by a force of 1 newton which acts over a distance of 1 meter in the direction of the force.

k or k-Value: thermal conductivity; the time rate of heat flow through a unit area of a homogeneous material in a direction perpendicular to isothermal planes induced by a unit temperature gradient. In English (inch-pound) units of measurement, it is the number of BTUS that pass through a 1 inch (25 mm) thickness of a 1 square foot (0.09 m^2) sample of material in 1 hour with a temperature difference between the two surfaces of 1° F. It is expressed as Btu·inch/h·ft^2·°F.

Kerf: (1) a slit or notch made by a saw or cutting torch; (2) the width of cut made by a saw or cutting torch.

Kesternich test: simulates acid rain conditions by subjecting test specimens to a sulfur dioxide atmosphere as well as condensing moisture for the purpose of evaluating rust/corrosion characteristics.

Knee cap: a metal cover trim that fits over a panel rib after it has been cut and bent.

Knee joints: see Knuckle.

Knuckle: a metal closure, either shop-or pre-fabricated, installed over the cut seam of a continuous metal roof panel at the transition from a steep-slope roof to a vertical roof or wall.

Laitance: a weak layer of cement and aggregate fines on a concrete surface that is usually caused by an overwet mixture, overworking the mixture, improper or excessive finishing or combination thereof.

Laminate: to join layers of materials together using fusion; the process of joining layers of materials together using adhesion.

Laminated shingles: see Dimensional shingles or Architectural shingles.

Lap: that part of a roofing, waterproofing, or flashing component that overlaps or covers any portion of the same or another type of adjacent component.

Lap cement: an asphalt-based roof cement formulated to adhere overlapping plies or asphalt roll roofing.

Lap seam: occurs where overlapping materials are seamed, sealed or otherwise bonded.

Latex: a stable dispersion of polymeric substance in an essentially aqueous medium.

Lead: a soft malleable, heavy metal; has low melting point and a high coefficient of thermal expansion.

Leader head: see Conductor head.

Lift: the sprayed polyurethane foam that results from a pass. It usually is associated with a certain pass thickness and has a bottom layer, center mass and top skin in its makeup.

Liquid-applied: application of bituminous cements, adhesives or coatings installed at ambient or slightly elevated temperatures.

Liquid-applied built-up roof: a continuous, semi-flexible roof membrane, consisting of multiple plies of felts, mats or fabrics laminated together with alternate layers of roof cements and surfaced with a liquid -applied coating with or without aggregate surfacing.

Live loads: temporary loads that the roof structure must be designed to support, as required by governing building codes. Live loads are generally moving and/or dynamic or environmental, (e.g., people, installation equipment, snow, ice or rain, etc.).

Loose-laid membrane: a ballasted roofing membrane that is attached to the substrate only at the edges and penetrations through the roof.

Low-slope roofs: a category of roofs that generally include weatherproof membrane types of roof systems installed on slopes at or less than 3:12 (14 degrees).

Low temperature flexibility: the ability of a membrane or other material to resist cracking when flexed after it has been cooled to a low temperature.

Mansard: a decorative steep-sloped roof on the perimeter of a building.

Mansard roof: a steeper roof that terminates into a flat roof at its high point.

Masonry: construction, usually set in mortar, of natural building stone or manufactured units, such as brick, concrete block, adobe, glass block, tile, manufactured stone or gypsum block.

Mastic: a thick adhesive material used as a cementing agent for holding waterproofing membrane in place. (see Asphalt roof cement).

Mat: a thin layer of woven, non-woven, or knitted fiber that serves as reinforcement to a material or membrane.

Mat slab: a concrete slab designed with reinforcement to resist the uplift forces created by hydrostatic pressure.

Material safety data sheets (MSDS): a written description of the chemicals in a product and other pertinent data, including such things as safe handling and emergency procedures. In accordance with OSHA regulations, it is the manufacturer's responsibility to produce an MSDS and the employers responsibility to communicate its contents to employees.

Mechanical damage: in SPF-based roofing, physical damage to a completed SPF-based roof system not caused by normal wear and tear.

Mechanically fastened membranes: generally used to describe membranes that have been attached at defined intervals to the substrate.

Membrane: a flexible or semi-flexible roof covering or waterproofing whose primary function is to exclude water.

Metal: any of various opaque, fusible, ductile and typically lustrous substances that are good conductors of electricity and heat.

Metallic waterproofing: consist of finely graded iron particles combined with an oxidizing catalyst. When mixed with water (or water, cement, and sand), the finely distributed particles expand, creating a waterproof layer that becomes a part of the surface to which it is applied.

Metal rain collar: a metal counterflashing used to wrap a penetration and prevent water infiltration though the top of the penetration base flashing.

Meter: unit of length measurement in the metric system; 1 meter is equal to 39.37 inches.

Metal roof panel: an interlocking metal sheet having a minimum installed weather exposure of 3 square feet (279000 mm^2 or 0.28 m^2) per sheet.

Metal roof shingle: an interlocking metal sheet having an installed weather exposure less than 3 square feet (279000 mm^2 or 0.28 m^2) per sheet.

Mil: a unit of measure, one mil is equal to 0.001 inches, or 25.4 micrometers (µm), often used to indicate the thickness of a roofing membrane.

Mildew: a superficial growth produced on organic matter or living plants by fungi.

Millimeter: a unit of measure equal to one thousandth (0.001) of a meter, or 0.03937 inches.

Mineral fiber: insulation composed principally of fibers manufactured from rock, slag or glass, with or without binders.

Mineral granules: see Granules.

Mineral stabilizer: a fine, water-insoluble inorganic material, used in a mixture with solid or semi-solid bituminous materials.

Mineral-surfaced roofing: roofing materials whose surface or top layer consists of a granule-surfaced sheet.

Mineral-surfaced sheet: a roofing sheet that is coated on one or both sides with asphalt and surfaced with mineral granules.

Miter joint: a joint between two members at an angle to each other; each member is cut at an angle equal to half the angle of the junction; usually the members are at right angles to each other.

Model (building) codes: a compilation of standards or codes established to provide uniformity in regulations pertaining to building construction.

Modified bitumen: (1) a bitumen modified by including one or more polymers (e.g., atactic polypropylene, styrene butadiene styrene, etc.); (2) composite sheets consisting of a polymer modified bitumen often reinforced with various types of mats or films and sometimes surfaced with films, foils or mineral granules.

Moisture contour map: a map used to graphically define the location of moisture within a roof assembly after a moisture scan has been performed.

Moisture relief vent: a venting device installed through the roofing membrane to relieve moisture vapor pressure from within the roofing system.

Moisture scan: the use of a mechanical device (capacitance, infrared, or nuclear) to detect the presence of moisture within a roof assembly. (see Non-destructive testing.)

Mole run: a meandering ridge in a roof membrane not associated with insulation or deck joints.

Monolithic: formed from or composed of a single material; seamless.

Monomer: a low-molecular-weight substance consisting of molecules capable of reacting with like or unlike molecules to form a polymer.

Mop-and-flop: an application procedure in which roofing elements (insulation boards, felt plies, cap sheets, etc.) are initially placed upside down adjacent to their ultimate locations; coated with adhesive or bitumen; and turned over and adhered to the substrate.

Mopping: the application of hot bitumen with a mop or mechanical applicator to the substrate or plies of a bituminous membrane. There are four types of mopping.

- Solid mopping: a continuous coating.
- Spot mopping: bitumen is applied roughly in circular areas, leaving a grid of unmopped perpendicular areas.
- Sprinkle mopping: bitumen is shaken onto the substrate from a broom or mop in a random pattern.
- Strip mopping: bitumen is applied in parallel bands.

Mud cracking: surface cracking resembling a dried mud flat.

Mud slab: a layer of concrete, typically 2 inches (50 mm) to 6 inches (150 mm) thick, used as the substrate for membrane waterproofing.

Nailer: (sometimes referred to as blocking) a piece or pieces of dimensional lumber and/or plywood secured to the structural deck or walls, which provide a receiving medium for the fasteners used to attach membrane or flashing.

NBP: acrylonitrile butadiene polymer blend. One proprietary NBP membrane is commonly referred to as nitrile butadiene copolymer.

Negative side waterproofing: an application wherein the waterproofing system and source of hydrostatic pressure are on opposite sides of the structural element.

Neoprene: a synthetic rubber (polychloroprene) used in liquid and sheet-applied elastomeric roof membranes or flashings.

Nesting: (1) the installation of new metal roof deck directly on top of existing metal roof deck; (2) a method of reroofing with new asphalt shingles over existing shingles in which the top edge of the new shingle is butted against the bottom edge of the existing shingle.

Net free vent area: the area (measured in square inches) open to unrestricted air flow and commonly used as a yardstick to measure relative vent performance; the area of the opening of a vent minus the area displaced by the screening material.

Newton (N): SI unit of measure for force.

Night seal (or night tie-in): a material and/or method used to temporarily seal a membrane edge during construction to protect the roofing assembly in place from water penetration. Usually removed when roofing application is resumed.

NIST: National Institute of Standards and Technology

Nitrile alloy: an elastomeric material of synthetic nonvulcanizing polymers.

Nitrile rubber: a membrane whose predominant resinous ingredient is a synthetic rubber made by the polymerization of acrylonitrile with butadiene.

Noble metal: a metal that readily receives electrons from an anodic metal (see Galvanic series).

No-cutout shingles: shingles consisting of a single solid strip with no cutouts.

Nondestructive testing (NDT): a method to evaluate the disposition, strength or composition of materials or systems without damaging the object under test. Typically used to evaluate moisture content in roofing assemblies, the three common test methods are electrical capacitance, infrared thermography and nuclear back-scatter.

Nonflammable: not easily ignited and not burning rapidly if ignited.

Nonfriable: a material that, when dry, cannot be crumbled, pulverized or reduced to powder by hand pressure.

Nonoxidizing: a material which resists oxidation in exterior exposures or accelerated weathering.

Non-traffic bearing: for waterproofing purposes, a membrane system requiring some form of protection barrier and wearing surface.

Nonvolatile content: the portion of a coating that does not evaporate during drying or curing under specified conditions, comprising the binder and, if present, the pigment. (The percent volatile content is obtained by subtracting the nonvolatile content from 100.).

Nonwoven fabric: a textile structure produced by bonding or interlocking of fibers, or both, accomplished by mechanical, chemical, thermal, or solvent means and combinations thereof.

NRCA: National Roofing Contractors Association.

Nuclear hydrogen detection (NHD) meter: a device that contains a radioactive source to emit high velocity neutrons into a roof system. Reflecting neutrons are measured by a gauge that is used to detect hydrogen; the quantity of hydrogen detected may be linked to the pressure of water.

Nylon: generic name for a family of polyamide polymers, used as a scrim in some fabric-reinforced sheeting.

Off-ratio foam: SPF that has excess isocyanate or resin. Off-ratio will not exhibit the full physical properties of normal SPF.

Open time: the period of time after an adhesive has been applied and allowed to dry, during which an effective bond can be achieved by joining the two surfaces.

Open valley: a method of valley construction in which the steep-slope roofing on both sides are trimmed along each side of the valley, exposing the metal valley flashing.

Orange peel surface texture: in SPF roofing, a condition of the foam in which the surface shows a fine texture and is compared to the exterior skin of an orange. This surface is considered acceptable for receiving a protective coating.

Organic: being or composed of hydrocarbons or their derivatives, or matter of plant or animal origin.

Organic felt: an asphalt roofing base material manufactured from cellulose fibers.

Organic shingle: an asphalt shingle reinforced with material manufactured from cellulose fibers.

ORNL: Oak Ridge National Laboratory.

Osmosis: movement of a solvent through a semipermeable membrane into a solution of higher solute concentration that tends to equalize the concentration of solute on the two sides of the membranes.

Overflow drainage: component in a roof drainage system used to protect the roof against damage from a water load imposed by blocked or partially blocked primary drainage system; e.g., overflow scupper, overflow interior drain.

Overspray: undesirable depositions of airborne spray.

Overspray surface texture: in SPF roofing, a condition of the foam in which the surface shows a linear coarse textured pattern and/or a pebbled surface. This surface is generally downwind of the sprayed polyurethane path and, if severe, unacceptable for proper coating coverage and protection.

Ozone: a triatomic form of oxygen that is a bluish gas of pungent odor; is formed naturally in the upper atmosphere by a photochemical reaction with solar ultraviolet radiation.

Ozone resistance: the ability of a material to resist the deteriorating effects of ozone exposure.

Pallet: a platform (typically wooden) used for storing and shipping materials.

Pan: the bottom flat part of a roofing panel that is between the ribs of the panel.

Pan former: power roll-forming equipment that produces a metal roofing panel from a flat sheet.

Parapet wall: the part of a perimeter wall that extends above the roof.

Parge: in masonry construction, a coat of cement mortar on the face of rough masonry, the earth side of foundation and basement walls, or the like.

Partially attached: a roofing assembly in which the membrane has been "spot affixed" to a substrate, usually with an adhesive or a mechanical device.

Parting agent: a material applied to one or both surfaces of a sheet to prevent blocking.

Pascal: SI unit of measure for force per unit area; 1 Pa=1 N/m^2.

Pass: (1) a layer of material, usually applied by the spray method, that is allowed to reach cure before another layer ("pass") is applied; (2) a term used to explain a spray motion of the foam gun in the application of the spray polyurethane foam (SPF) material. The speed of the pass controls the thickness of the SPF.

Pass line: the junction of two passes of SPF. A distinct line is formed by the top skin of the bottom pass and the next pass adhering to this skin.

Pedestal: a support or base for roof top components such as pavers, pipes and small roof top units.

Peel strength: the average load per unit width required to separate progressively a flexible member from a rigid member or another flexible member.

Penetration: (1) any construction (e.g., pipes, conduits, HVAC supports) passing through the roof; (2) the consistency of a bituminous material expressed as the distance, in tenths of a millimeter (0.1 mm), that a standard needle penetrates vertically into a sample of material under specified conditions of loading, time, and temperature.

Perlite: an aggregate used in lightweight insulating concrete and preformed perlitic insulation boards, formed by heating and expanding siliceous volcanic glass.

Perm: see Permeance.

Permeability: (1) the capacity of a porous material to conduct or transmit fluids; (2) the time rate of vapor transmission through unit area of flat material of unit thickness induced by unit vapor pressure difference between two specific surfaces, under specified temperature and humidity conditions. The English (inch·pound) unit of measurement for permeability is gr/hr·ft^2·(in. Hg/in.), which is commonly referred to as "perm·inch" units.

Permeance: (1) the rate of water vapor transmission per unit area at a steady state through a material, membrane, or assembly; (2) the time rate of water vapor transmission through unit area of flat material or construction induced by unit vapor pressure difference between two specific surfaces, under specified temperature and humidity conditions. The English (inch·pound) unit of measurement for permeance is gr/h·ft^2·in. Hg, which is commonly referred to as "perm" units.

pH: a measure of the acidity or alkalinity of a solution, with neutrality represented by a value of 7, with increasing acidity represented by increasingly smaller values, and with increasing alkalinity represented by increasingly larger values.

Phased application: the installation of a roofing or waterproofing system during two or more separate time intervals or different days. Application of surfacings at different time intervals are typically not considered phased application. (see Surfacing.) A roofing system not installed in a continuous operation.

Picture framing: a square or rectangular pattern of ridges in a roof membrane or covering over insulation or deck joints.

Pigment: an insoluble compounding material used to impart color.

Pinhole: a tiny hole in a coating, film, foil, membrane or laminate comparable in size to one made by a pin.

Pipe boot: prefabricated flashing piece used to flash around circular pipe penetrations.

Pitch: see Coal tar.

Pitch-pocket (Pitch-pan): a flanged, open bottomed enclosure made of sheet metal or other material, placed around a penetration through the roof, filled with grout and bituminous or polymeric sealants to seal the area around the penetration.

Pittsburgh lock seam: a method of interlocking metal, usually at a slope change.

Plastic cement: a roofing industry generic term used to describe asphalt roof cement that is a trowelable mixture of solvent-based bitumen, mineral stabilizers, and other fibers and/or fillers. Generally, intended for use on relatively low slopes, not vertical surfaces. (also see Asphalt roof cement and Flashing cement.)

Plasticizer: a material incorporated in a material to increase its ease of workability, flexibility or distensibility.

Plasticizer migration: in some thermoplastic roofing membranes, the loss of plasticizer chemicals from the membrane, resulting in shrinkage and embrittlement of the membrane, typically PVC.

Pliability: the material property of being flexible or moldable.

Ply: a layer of felt or ply sheet in a built-up roof membrane or roof system.

PMR: protected membrane roof.

Polychloroprene: see Neoprene.

Polyester: a polymer in which the repeated structural unit in the chain is of the ester type.

Polyisobutylene (PIB): a product formed by the polymerization of isobutylene. May be compounded for use as a roof membrane material.

Polymer: a macromolecular material formed by the chemical combination of monomers having either the same or different chemical composition.

Polymer modified bitumen: see Modified bitumen.

Polymeric methylene diphenyl diisocyanate (PMDI): component A in SPF. An organic chemical compound having two reactive isocyanate groups. It is mixed with the B component to form polyurethane.

Polymerization: a chemical reaction in which monomers are linked together to form polymers.

Polypropylene: a polymer prepared by the polymerization of propylene as the sole monomers.

Polyol: a polyhydric alcohol, i.e., one containing three or more hydroxyl groups, one component of polyisocyanurate and polyurethane compounds.

Polyvinyl chloride (PVC): a synthetic thermoplastic polymer prepared from vinylchloride. PVC can be compounded into flexible and rigid forms through the use of plasticizers, stabilizers, fillers and other modifiers. Rigid forms are used in pipes; flexible forms are used in the manufacture of sheeting and roof membrane materials.

Polystyrene: a polymer prepared by the polymerization of styrene as the sole monomer.

Pond: a surface which is incompletely drained.

Ponding: the excessive accumulation of water at low-lying areas on a roof that remains after the 48 hours after the end rainfall under conditions conducive to drying.

Pop rivet: a relatively small-headed pin with an expandable head for joining light gauge sheet metal.

Popcorn surface texture: in SPF roofing, the condition in which the foam surface shows a coarse texture where valleys form sharp angles. This surface is unacceptable for proper coating and protection.

Positive drainage: the drainage condition in which consideration has been made during design for all loading deflections of the deck and additional roof slope has been provided to ensure drainage of the roof area within 48 hours following rainfall during conditions conducive to drying.

Positive side waterproofing: an application where the waterproofing systems and the source of the hydrostatic pressure are on the same side of the structural element.

Pot life (Working life): the period of time during which a reacting composition remains suitable for its intended processing after mixing with reaction initiating agents .

Pourable sealer: a type of sealant often supplied in two parts and used at difficult-to-flash penetrations, typically in conjunction with pitch-pockets to form a seal.

Press brake: a machine used in cold-forming sheet metal or strips of metal into desired profiles.

Prestressed concrete: concrete in which the reinforcing cables, wires or rods in the concrete are tensioned before there is load on the structural member, holding the concrete in compression for greater strength.

Pre-tinning: coating a metal with solder or tin alloy prior to soldering or brazing it.

Primer: (1) a thin, liquid-applied solvent-based bitumen that may be applied to a surface to improve the adhesion of subsequent applications of bitumen; (2) a material that is sometimes used in the process of seaming single-ply membranes to prepare the surfaces and increase the strength (in shear and peel) of the field splice; (3) a thin liquid-applied material that may be applied to the surface of SPVF to improve the adhesion of subsequent application of SPVF protective coatings.

Proportioner: the basic pumping unit for SPF or two-component coating systems. Consists of two positive displacement pumps designed to dispense two components at a precisely controlled ratio.

Protection course: a sacrificial material used to shield a waterproofing material from damaging external forces.

Protection mat: a sacrificial material used to shield one roof system component from another.

Protected membrane roof (PMR): an insulated and ballasted roofing assembly in which the insulation and ballast are applied on top of the membrane (sometimes referred to as an “inverted roof assembly”).

Psychrometer: an instrument used to measure humidity in the atmosphere from two thermometers which are similar except that the bulb of one is kept wet, the bulb of the other being dry.

Psychrometric chart: chart showing the relationship between dew point temperature, dry bulb temperature, wet bulb temperature and relative humidity.

Puncture resistance: the ability of a material to withstand the action of a penetrating or puncturing object.

Purlin: horizontal secondary structural member that transfers loads from the primary structural framing.

PVC: polyvinyl chloride.

R-value: see Thermal resistance.

Racking: a method of asphalt shingle application, also referred to as the straight-up method, whereby shingle courses are applied vertically, up the roof rather than laterally or across and up.

Rafter: one of a series of sloped structural members, that extend from the ridge or hip to the downslope perimeter or eave, designed to support the roof deck and its associated loads.

Raggle: a groove or slot, often cut in a masonry wall or other vertical surface adjoining a roof, for inserting an inset flashing component such as a reglet.

Rake: the sloped edge of a roof at or adjacent to the first or last rafter.

Rake-starter (Bleeder strip): starter-strip used along rake edges in conjunction with asphalt shingle roofing.

Re-cover: the addition of a new roof membrane or steep-slope roof covering over a major portion of an existing roof assembly. This process does not involve removal of the existing roofing.

Reflectivity: see Light reflectance.

Reglet: a sheet metal receiver for the attachment of counterflashing. A reglet may be surface-mounted, inset into a raggle or embedded behind cladding.

Reinforced membrane: a roofing or waterproofing membrane that has been strengthened by the addition or incorporation of one or more reinforcing materials, including woven or nonwoven glass fibers, polyester mats or scrims, nylon, or polyethylene sheeting.

Relative humidity (RH): the ratio of the pressure of water vapor present in a given volume of air to the pressure of fully saturated water vapor at the same temperature, expressed as a percentage.

Release tape (or Strip): a plastic film or paper strip that is applied to the back of self-sealing shingles and other materials. The strip prevents the material from sticking together in the roll or bundle. With asphalt shingles, the strip need not be removed for application of the shingles.

Replacement: the practice of removing an existing roof system down to the roof deck and replacing it with a new roofing system.

Reroofing: the process of re-covering, or tearing-off and replacing an existing roof system.

Resin: component B in SPF. This component contains a catalyst, blowing agent, fire retardants, surfactants and polyol. It is mixed with the A component to form polyurethane.

Ridge: highest point on the roof, represented by a horizontal line where two roof areas intersect, running the length of the area.

Ridge cap: a material or covering applied over the ridge of a roof.

Ridge course: the last or top course of roofing materials, such as tile, roll roofing, shingles, etc., that covers the ridge and overlaps the intersecting field roofing.

Ridge vent: a ventilator located at the ridge that allows the escape of warm and/or moist air from the attic area or rafter cavity.

Ridging: see Buckle.

Roll materials: a general term applied to rolls of roofing felt, ply sheet, etc., which are typically furnished in rolls.

Roll roofing: coated felts, either smooth or mineral-surfaced.

Roof: (1) the cover of a building; (2) to cover with a roof.

Roof area divider: refer to area divider.

Roof area expansion Joint: see expansion joint.

Roof assembly: an assembly of interacting roof components including the roof deck, vapor retarder (if present), insulation and roof covering.

Roof cement: see Asphalt roof cement or Coal tar roof cement.

Roof covering: the exterior roof cover or skin of the roof assembly, consisting of membrane, panels, sheets, shingles, tiles, etc.

Roof curb: raised frame used to mount mechanical units (such as air conditioning or exhaust fans), skylights, etc. on a roof.

Roof jack: a metal or wood bracket used to support toe-boards on steep-slope roofs. (also see Flashing Collar.)

Roof overhang: a roof extension beyond the exterior wall of a building.

Roof seamer: (1) machine that crimps neighboring metal roof panels together; (2) machine that welds laps of membrane sheets together using heat, solvent, or dielectric energy.

Roof slope: the angle a roof surface makes with the horizontal, expressed as a ratio of the units of vertical rise to the units of horizontal length (sometimes referred to as run). For English units of measurement, when dimensions are given in inches, slope may be expressed as a ratio of rise to run, such as 4:12 or as an angle.

Roof system: a system of interacting roof components, generally consisting of a membrane or primary roof covering and roof insulation (not including the roof deck) designed to weatherproof and, sometimes, to improve the building's thermal resistance.

Rosin paper (specifically Rosin-sized sheathing paper): a nonasphaltic paper used as a sheathing paper or slip sheet in some roof systems.

Rubber: a material that is capable of recovering from large deformations quickly and forcibly.

Run: horizontal dimension of a slope.

Saddle: a small tapered/sloped roof area structure that helps to channel surface water to drains. Frequently located in a valley. A saddle is often constructed like a small hip roof or pyramid with a diamond-shaped base. (see Cricket.)

Sag: undesirable excessive flow in material after application to a surface.

Saturated felt: a felt that has been immersed in hot bitumen; the felt adsorbs as much bitumen as it can retain under the processing conditions, but remains porous and contains voids.

SBCCI: Southern Building Code Congress International, Inc.

SBS: see Styrene butadiene styrene.

Scarfed: shaped by grinding.

Screeding: the process of striking off excess concrete to bring the top surface of the concrete to the proper finish and elevation.

Screen wall: a nonstructural wall erected around units or curbs on a roof. Typically the framing consists of girts with a wood or metal covering attached to the frame.

Scrim: a woven, nonwoven or knitted fabric composed of continuous strands of material used for reinforcing or strengthening membranes.

Scupper: drainage device in the form of an outlet through a wall, parapet wall or raised roof edge lined with a soldered sheet metal sleeve.

Scuttle: a hatch that provides access to the roof from the interior of the building.

SDI: Steel Deck Institute.

Sealant: (1) a material that has the adhesive and cohesive properties to form a seal; (2) a mixture of polymers, fillers, and pigments used to fill and seal joints where moderate movements is expected; unlike caulking, it cures to a resilient solid.

Sealant backing: a compressible material placed in a joint before applying a sealant.

Sealer: a coating designed to prevent excessive absorption of finish coats into porous surfaces; a coating designed to prevent bleeding.

Sealing washer: a rubber or neoprene washer, sometimes metal-backed, typically placed on a fastener to prevent water from migrating into and through the fastener hole.

Seam: a joint formed by mating two separate sections of material. Seams can be made or sealed in a variety of ways, including adhesive bonding, hot-air welding, solvent welding, using adhesive tape, sealant, etc.

Seam sample: in single-ply and sometimes modified bitumen membrane roofing, a sample from the membrane that extends through the side lap of adjacent rolls of membrane, taken for the purpose of assessing the quality of the seam.

Self-adhering membrane: a membrane that can adhere to a substrate and to itself at overlaps without the use of an additional adhesive. The undersurface of a self-adhering membrane is protected by a release paper or film, which prevents the membrane from bonding to itself during shipping and handling.

Self-drilling screw: a fastener that taps and drills its own hole during application.

Self-sealing shingle: an asphalt shingle containing a factory-applied strip or spots of heat sensitive adhesive intended to adhere the overlying shingle once installed on the roof and warmed by the sun.

Self-tapping screw: a fastener that forms receiving threads when turned in a previously drilled hole.

Selvage: (1) an edge or edging that differs from the main part of a fabric, granule-surfaced roll roofing or cap sheet, or other material; (2) a specially defined edge of the material (lined for demarcation), which is designed for some special purpose, such as overlapping or seaming.

Separator layer: refer to Slip sheet.

Service temperature limits: the minimum or maximum temperature at which a coating, SPF or other material will perform satisfactorily.

Set: to convert into a fixed or hardened state by chemical or physical action.

Shading: slight differences in surfacing color, such as shingle granule coloring, that may occur as a result of manufacturing operations.

Shark fin: an upward-curled felt side lap or end lap.

Shear strength: the resistance to forces that cause or tend to cause two contiguous parts of a body to slide relative to each other in a direction parallel to their contrast.

Shed roof: a roof having only one sloping plane and no hips, ridges or valleys.

Shelf life: the maximum time a packaged material can be stored under specified conditions and still meet the performance requirements specified.

Shingle: (1) a small unit of prepared roofing designed for installation with similar units in overlapping rows or courses on inclines normally exceeding 3:12 slope (14°); (2) to cover with shingles; (3) to apply any sheet material in succeeding overlapping rows like shingles.

Shingling: (1) the application of shingles; (2) the procedure laying parallel felts so that one longitudinal edge of each felt overlaps and the other longitudinal edge underlaps an adjacent felt. Normally felts are shingled on a slope so that water flows over rather than against each lap.

Shrinkage: a decrease in one or more dimensions of an object or material.

Shrinkage crack: in waterproofing, a separation in a material, such as a concrete substrate, caused by the inability of the material to resist a reduction in size which occurs during its hardening or curing process or both.

SI: an abbreviation for the International System of Units (Le Systeme International d'Unites).

Side lap: the continuous longitudinal overlap of neighboring like materials.

Side lap fastener: a fastener used to connect adjacent panels together at the side lap.

Siding: the finish covering of an exterior wall of a frame building; the siding may be a cladding material such as wood, aluminum or vinyl (but not masonry).

Sieve: an apparatus with square apertures for separating sizes of material.

Sill: the bottom horizontal framing member of an opening, such as below a window or door.

Sill flashing: a flashing of the bottom horizontal framing member of an opening, such as below a window or door.

Single-lock standing seam: a standing seam that uses one overlapping interlock between two seam panels, in contrast with the double interlocking used in a double standing seam.

Single-ply membranes: roofing membranes that are field applied using just one layer of membrane material (either homogeneous or composite) rather than multiple layers.

Single-ply roofing: a roofing system in which the principal roof covering is a single layer flexible membrane often thermoset or thermoplastic membrane.

Skinning: the formation of a dense film on the surface of a liquid coating or mastic.

Skirt flashing: a formed metal counterflashing secured under a mechanical unit or skylight to cover and protect the upper edge of a base flashing and its associated fasteners.

Skylight: an opening in a roof that is glazed with a transparent or translucent material; used to admit diffused light to the space below.

Slab on grade: a horizontal placement of concrete placed directly over a prepared earth substrate.

Slag: a hard aggregate that is left as a residue from blast furnaces, which may be used as a surfacing material on certain (typically bituminous) roof membrane systems.

Slate: a hard, brittle metamorphic rock consisting mainly of clay minerals, used extensively as dimensional stone for steep roofing and in granular form as surfacing on some other roofing materials.

Slating hook: a steep-slope roofing attachment device, shaped like a hook, that can be used for fastening roofing slate.

Slip sheet: sheet material, such as reinforced kraft paper, rosin-sized paper, polyester scrim or polyethylene sheeting, placed between two components of a roof assembly (such as between membrane and insulation or deck) to ensure that no adhesion occurs between them and to prevent possible damage from chemical incompatibility, wearing or abrasion of the membrane.

Slit sample: in SPF roofing, a small cut about 1 inch x ½ inch x ½ inch (25 mm x 13 mm x 13 mm), in a half-moon shape, used to measure coating film thickness.

Slope: the angle of incline, usually expressed as a ratio of rise to run, or as an angle. (See Roof Slope.)

SMACNA: Sheet Metal and Air Conditioning Contractors National Association.

Smooth surface texture: in SPF roofing, the condition of the foam in which the surface shows spray undulation and is ideal for receiving a protective coating.

Smooth-surfaced roof: a roof membrane without mineral granule or aggregate surfacing.

Snap-on cap: a separate cap that snaps on over the vertical legs of some single standing or batten seam metal roof systems.

Snow guard: a series of devices attached to the roof in a pattern that attempts to hold snow in place, thus preventing sudden snow or ice slides from the roof; any device intended to prevent snow from sliding off a roof.

Snow load: the live load due to the weight of snow on a roof; included in design calculations.

Soffit: the exposed undersurface of any exterior overhanging section of a roof eave.

Soffit vent: a premanufactured or custom built air inlet source located at the downslope eave or in the soffit of a roof assembly.

Softening point: the temperature at which bitumen becomes soft enough to flow, as determined by an arbitrary, closely defined method (ASTM Standard test method D 36 or D 3461).

Softening point drift: a change in the softening point of bitumen during storage or application. (see Fallback.)

Soil stack: a sanitation pipe that penetrates the roof; used to vent plumbing fixtures.

Solder: a lead/tin mixture that is melted and used to bond two pieces of some types of metals together.

Solid mopping: see Mopping.

Solids content: the percentage by weight of the nonvolatile matter in an adhesive.

Solvent: any liquid used to dissolve another material.

Solvent cleaners: used to clean some single-ply roofing membranes prior to splicing, typically including heptane, hexane, white gasoline, and unleaded gasoline.

Solvent welding: a process where a liquid solvent is used to chemically weld or join together two or more layers of certain membrane materials (usually thermoplastic).

Spalling: breaking off of plate-like pieces from a concrete, rock or masonry surface.

Special steep asphalt: asphalt complying with ASTM D 312, Type IV. (see Asphalt.)

Specification: a precise statement of a set of requirements to be satisfied by a material, product, system, or service.

SPF: spray polyurethane foam.

SPFA: Sprayed Polyurethane Foam Alliance (a business unit of the American Plastics Council).

SPF compound: a term used to describe the raw materials (isocyanate and resin) used to make polyurethane foam.

Splash block: a small masonry or polymeric block laid on the ground or lower roof below the opening of a downspout used to help prevent soil erosion and aggregate scour in front of the downspout.

Splice: bonding or joining of overlapping materials. (see Seam.)

Splice plate: a metal plate placed underneath the joint between two pieces of metal.

Splice-tape: cured or uncured synthetic rubber tape used for splicing membrane materials.

Split: a membrane tear resulting from tensile stresses.

Split slab: a term used to describe two separate concrete slabs. The first is placed as a slab on grade or suspended slab, and covered with waterproofing and a drainage system. The second slab, also referred to as a topping slab, is then placed over the underlying slab and waterproofing.

Spot mopping: see Mopping.

Sprayed polyurethane foam (SPF): a foamed plastic material, formed by spraying two components, PMDI (A component) and a resin (B component) to form a rigid, fully adhered, water-resistant, and insulating membrane.

Spread coating: a manufacturing process in which membranes are formed using a liquid compound that is spread onto a supporting reinforcement base layer and then dried to its finished condition.

Sprinkle mopping: see Mopping.

Spunlaced: a nonwoven fabric made by mechanically bonding a dry-laid staple fabric by water jet, which entangles the individual fibers.

Spud: to remove the roofing aggregate and most of the bituminous top coating by scraping and chipping.

Square: a unit used in measuring roof area equivalent to 100 square feet (9.29 m2) of roof area.

Square-tab shingles: shingles with tabs that are all the same size and exposure.

Squeegee: (1) a blade of leather or rubber set on a handle and used for spreading, pushing or wiping liquid material on, across or off a surface; (2) to smooth, wipe or treat with a squegee.

Stainless steel: an alloy of steel that contains chromium and also may contain nickel or copper. Generally, has very good resistance to corrosion.

Standing seam: in metal roofing, a type of seam between adjacent sheets of material made by turning up the edges of two adjacent metal panels and then folding or interlocking them in a variety of ways.

Starter course: the first layer of roofing, applied along a line adjacent to the downslope perimeter of the roof area. With steep-slope watershedding roof coverings, the starter course is covered by the first course.

Starter sheets: (1) felt, ply sheet or membrane strips that are made or cut to widths narrower than the standard width of the roll and used to start the shingling pattern at an edge of the roof; (2) particular width sheets designed for perimeters in some mechanically attached and fully adhered single-ply systems.

Starter strip: roll roofing or shingle strips applied along the downslope eave line before the first course of roofing and intended to fill spaces between cutouts and joints of the first course.

Static load: any load, as on a structure, that does not change in magnitude or position with time.

Steel: a malleable alloy of iron and carbon produced by melting and refining pig iron and/or scrap steel; graded according to the carbon content (in a range from 0.02 to 1.7%); other elements, such as manganese and silicon, may be included to provide special properties.

Steel joist (open web steel joist): normally used as a horizontal supporting member between beams or other structural members, suitable for the support of some roof decks.

Steep asphalt: asphalt complying with ASTM D 312, Type III. (see Asphalt.)

Steep-slope roofs: a category of roofing that generally include water-shedding types of roof coverings installed on slopes exceeding 3:12 (14 degrees).

Step flashing: individual pieces of sheet metal material used to flash walls, around chimneys, dormers and such projections along the slope of a roof. Individual pieces are overlapped and stepped up the vertical surface.

Stick clip: in waterproofing, a non-penetrating fastener that is adhered to the waterproofing surface; typically used to retain insulation, drainage panels, prefabricated protection materials, etc., against the waterproofing to prevent sliding and displacement.

Stiffener rib: small intermediate bends in a metal pan used to strengthen the panel.

Storm anchor: see Wind clip.

Strapping (felts): a method of installing roofing rolls or sheet good materials parallel with the slope of the roof.

Straw nail: a long-shanked nail. Sometimes used for fastening over tile at hips and ridges.

Stress: the internal resistance of a material to a force, measured as a force per unit area.

Striations: a parallel series of small grooves, channels, or impressions typically within a metal roof panel used to help reduce the potential for oil-canning.

Strip mopping: see Mopping.

Strip shingles: asphalt shingles that are manufactured in strips, approximately three times as long as they are wide.

Strippable films: (for metal) added protection of plastic films sometimes applied to coated or finished metals after the coil coating process. Applied after prime and top coats to resist damage to the finish prior to and during shipping, fabrication and installation.

Stripping or strip-flashing: membrane flashing strips used for sealing or flashing metal flashing flanges into the roof membrane.

Stripping in: application of membrane stripping ply or plies.

Structural panel: a metal roof panel designed to be applied over open framing rather than a continuous or closely spaced roof deck.

Styrene butadiene rubber: high molecular weight polymers having rubber-like properties, formed by the random copolymerization of styrene and butadiene monomers.

Styrene butadiene styrene copolymer (SBS): high molecular weight polymers that have both thermoset and thermoplastic properties, formed by the block copolymerization of styrene and butadiene monomers. These polymers are used as the modifying compound in SBS polymer modified asphalt roofing membranes to impart rubber-like qualities to the asphalt.

Substrate: the surface upon which the roofing or waterproofing membrane is applied (e.g., in roofing, the structural deck or insulation).

Sump: an intentional depression around a roof drain or scupper that promotes drainage.

Sump pan: a metal pan used to create a depression around a drain or scupper to enhance drainage.

Superimposed loads: loads that are added to existing loads. For example, a large stack of insulation boards placed on top of a structural steel deck.

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 different SPF surface textures: smooth orange peel, coarse orange peel, verge of popcorn, popcorn, treebark, and oversprayed.

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

Surfactant: contraction for "surface active agent;" a material that improves the emulsifying, dispersing, spreading, wetting or other surface-modifying properties of liquids.

Tab: the exposed portion of strip shingles defined by cutouts.

Tack-free time: in SPF-based roofing, a curing phase of polyurethane foam to when the material is no longer sticky. When the polyurethane foam is tack free, it can be sprayed over with another pass, referred to as a "lift". With some care the polyurethane foam can be walked on soon after it is tack free.

Talc: whitish powder applied at the factory to the surface of some roofing materials (e.g., vulcanized EPDM membranes), used as a release agent to prevent adhesion of the membrane to itself.

Tapered edge strip: a tapered insulation strip used to (1) elevate and slope the roof at the perimeter and at curbs, and (2) provide a gradual transition from one layer of insulation to another.

Taping: (1) the technique of connecting joints between insulation boards or deck panels with tape; (2) the technique of using self-adhering tape-like materials to seam or splice single-ply membranes.

Tar: a brown or black bituminous material, liquid or semi-solid in consistency, in which the predominating constituents are bitumens obtained as condensates in the processing of coal, petroleum, oil-shale, wood, or other organic materials.

Tar boils: bubbles of moisture vapor encased in a thin film of bitumen, also known as "blackberries."

Tarred felt: see Coal tar felt.

Tear-off and reroof: the removal of all roof system components down to the structural deck, followed by installation of a completely new roof system.

Tear resistance: the load required to tear a material, when the stress is concentrated on a small area of the material by the introduction of a prescribed flaw or notch. Expressed in psi (pounds force) per inch width or kN/m (kilonewton per meter width).

Tear strength: the maximum force required to tear a specimen.

Tensile strength: the strength of a material under tension as distinct from torsion, compression or shear.

Tension leveling: the process of pulling metal coil stock between two spools under a certain pressure to help reduce side camber and potential oil canning in the coil stock caused by manufacturing and cutting processes.

Termination: the treatment or method of anchoring and/or sealing the free edges of the membrane in a roofing or waterproofing system.

Terne: an alloy of lead and tin, used to coat sheets of carbon steel or stainless steel for use as metal roofing sheet.

Terra cotta: low-fired clay, either glazed or unglazed.

Test cut: a sample of the roof system or assembly which exposes the roof deck and is used to diagnose the condition of the membrane, evaluate the type and number of plies or number of membranes, or rates of application (e.g., the weight of the average interply bitumen moppings).

Thermal block: a compression-resistant insulation block installed between structural steel roof panels and their supporting members to help maintain insulation R-values and reduce condensation.

Thermal bridge: the penetration of a material of high thermal conductivity (e.g., a metal insulation or roof membrane fastener) through a material of low thermal conductivity (e.g., thermal insulation); the result is a lowered thermal resistance for the assembly.

Thermal cycling: sequence of values caused by a repetitive temperature differential due to changes in radiant energy.

Thermal conductance (C): the time rate of heat flow through a unit area of a body induced by a unit temperature difference between bodies. In English (inch-pound) units of measurement, the number of BTUs that pass through a specified thickness of a one square foot (0.09 m2) sample of material in one hour with a temperature difference between the two surfaces of 1° F. In English (inch-pound) units it is expressed as Btu/h·ft^2·F.

Note 1: A thermal conductance (C) value applies to a specific thickness of a specific material.

Note 2: It is mathematically incorrect to multiply or divide the thermal conductance (C) value for a specific thickness of a material to determine the thermal conductance value of a different thickness of the same material.

Note 3: It is mathematically incorrect to add thermal conductance (C) values to determine overall thermal performance. If it is necessary to determine the overall thermal performance of a construction, it is appropriate to convert the individual thermal conductance (C) values to thermal resistance (R) values (i.e., R= 1/c), and then add the thermal resistance values (i.e., RT=R1, + R2 + ...).

Thermal conductivity (k): the time rate of heat flow through a unit area of a homogeneous material in a direction perpendicular to isothermal planes induced by a unit temperature gradient is called thermal conductivity (k or k-value). In English (inch-pound) units of measurement, it is the number of BTUs that pass through a 1 inch (25 mm) thickness of a 1 square foot (0.09 m^2) sample of material in one hour with a temperature difference between the two surfaces of 1°F. In English (inch-pound) units it is expressed as Btu·inch/h·ft^2·°F.

Note 1: A thermal conductivity (k) value applies to 1 inch (25 mm) thickness of a specific material.

Note 2: It is mathematically incorrect to add, multiply, or divide the thermal conductivity (k) value of a material to determine the thermal performance value of a different thickness of the same material. If it is necessary to determine the thermal performance of a specific thickness of a material, it is appropriate to convert the thermal conductivity (k) of the material to a thermal resistance (R) value (i.e., R = 1/k), and then perform the mathematical calculation.

Thermal expansion: the increase in the dimension or volume of a body due to temperature variations.

Thermal insulation: a material applied to reduce the flow of heat.

Thermal movement: changes in dimension of a material as a result of temperature changes.

Thermal resistance (R): under steady conditions, thermal resistance is the mean temperature difference between two defined surfaces of material or construction that induces unit heat flow through a unit area. In English (inch·pound) units it is expressed as °F·ft^2·h/Btu.

Note 1: A thermal resistance (R) value applies to a specific thickness of a material or construction.

Note 2: The thermal resistance (R) of a material is the reciprocal of the thermal conductance (C) of the same material (i.e., R = 1/C).

Note 3: Thermal resistance (R) values can be added, subtracted, multiplied, and divided by mathematically appropriate methods.

Thermal shock: the stress-producing phenomenon resulting from sudden temperature changes in a roof membrane when, for example, a cold rain shower follows brilliant sunshine.

Thermal stress: stress introduced by uniform or non-uniform temperature change in a structure or material that is contained against expansion or contraction.

Thermal transmittance (U or U-factor): thermal transmittance (U or U-factor) is the time rate of heat flow per unit area under steady conditions from the fluid (e.g., air) on the warm side of a barrier to the fluid (e.g., air) on the cold side, per unit temperature difference between the fluids. In English (inch·pound) units expressed as Btu/h·ft^2·°F.

Note 1: A thermal transmittance (U) value applies to the overall thermal performance of a system (e.g., roof assembly).

Note 2: Thermal transmittance (U) is sometimes called the overall coefficient of heat transfer.

Note 3: Thermal transmittance (U) is reciprocal of the overall thermal resistance (RT) of a system (i.e., U = 1/RT).

Thermography, Infrared: see Infrared thermography.

Thermoplastic: a material that softens when heated and hardens when cooled. This process can be repeated provided that the material is not heated above the point at which decomposition occurs.

Thermoplastic olefin membrane (TPO): a blend of polypropylene and ethylene-propylene polymers. Colorant, flame retardants, UV absorbers, and other proprietary substances which may be blended with the TPO to achieve the desired physical properties. The membrane may or may not be reinforced.

Thermoset: a class of polymers that, when cured using heat, chemical, or other means, changes into a substantially infusible and insoluble material.

Thinner: (1) a volatile liquid added to an adhesive or coating material to modify the consistency or other properties; (2) a liquid used to clean equipment or other surfaces.

Thixotropic: the property of a material that enables it to stiffen in a relatively short time on standing, but upon agitation or manipulation to change to a very soft consistency or to a fluid of high viscosity, the process being completely reversible.

Through-wall flashing: a water-resistant membrane or material assembly extending totally through a wall and its cavities, positioned to direct water within the wall to the exterior, usually through weep holes.

Tie-in: in roofing and waterproofing, the transitional seal used to terminate a roofing or waterproofing application at the top or bottom of flashings or by forming a watertight seal with the substrate, membrane, or adjacent roofing or waterproofing system.

T-joint: the condition created by the overlapping intersection of three or four sheets in the membrane.

Toggle bolt: a bolt having a nut with pivoted, flanged wings that close against a spring when it is pushed through a hole, and open after emerging from the hole; used to fasten objects to a hollow wall or to a wall which is accessible only from one side.

Tongue and groove planks: one of the oldest types of dimensional structural wood used as roof decking. The sides are cut with convex and concave grooves so adjacent planks may join in alignment with each other to form a uniform roof deck.

Torch-applied: method used in the installation of polymer modified bitumen membranes characterized by using open flame propane torch equipment.

TPO: thermoplastic olefin.

Traffic bearing: in waterproofing, a membrane formulated to withstand a predetermined amount of pedestrian or vehicular traffic with separate protection and a wear course.

Transverse seam: the joint between the top of one metal roof panel and the bottom of the next panel, which runs perpendicular to the roof slope.

Treebark surface texture: in SPF roofing, the surface condition of the foam which shows a coarse texture where valleys form sharp angles. This surface is unacceptable for proper coating and protection.

Tuckpointing: the process of removing deteriorated mortar from an existing masonry joint and troweling new mortar or other filler into the joint.

U-Value: see Thermal transmittance.

UBC: Uniform Building Code.

UL: Underwriters Laboratories, Inc.

UL label: an identification label or seal affixed to a roofing product or package with the authorization of Underwriters Laboratories, Inc. The presence of the label indicates that the product has met certain performance criteria.

Ultraviolet (UV): invisible light radiation, adjacent to the violet end of the visible spectrum, with wavelengths from about 200 to 400 nm (nanometres).

Underlayment: an asphalt-saturated felt or other sheet material (may be self-adhering) installed between the roof deck and roof covering, usually used in a steep-slope roof construction. Underlayment is primarily used to separate the roof covering from the roof deck, shed water and provide secondary weather protection for the roof area of the building.

Underwriters Laboratories, Inc. (UL): an organization that tests, rates and classifies roof assemblies for their resistance to fire, impact, leakage, corrosion of metal components and wind uplift.

Uplift: see Wind uplift.

Valley: the internal angle formed by the intersection of two sloping roof planes.

Vapor migration: the movement of water vapor from a region of high vapor pressure to a region of lower vapor pressure.

Vapor pressure: the pressure exerted by a vapor of a solid or liquid when in equilibrium with the liquid or solid.

Vapor retarder: a layer(s) of material or a laminate used to appreciably reduce the flow of water vapor into a roof assembly.

Veneer: (1) a single wythe of masonry for facing purposes that may not be structurally connected; (2) any of the thin layers of wood glued together to form plywood.

Vent: an opening designed to convey air, heat, water vapor or gas from inside a building or a building component to the atmosphere.

Ventilator: an accessory that is designed to allow for the passage of air.

Verge of popcorn texture: in SPF roofing, the verge of popcorn surface texture is the roughest texture suitable for receiving the protective coating on a sprayed polyurethane foam roof. The surface shows a texture where nodules are larger than valleys, with the valleys relatively cured. This surface is acceptable for receiving a protective coating only because of the relatively cured valleys. However, the surface is considered undesirable because of the additional amount of coating material required to protect the surface properly.

Vermiculite: an aggregate used in lightweight insulating concrete, formed by heating and expanding of a micaceous material.

Viscosity: the resistance of a material to flow under stress. For bitumen, measured in centipoise. (see Viscous.)

Viscous: resistant to flow under stress.

Void: an open space or break in consistency.

Volatile: a relative term expressing the tendency to form vapor.

Volatile organic compounds (VOC): means any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participate in atmospheric photochemical reactions.

Vulcanization: an irreversible process during which a rubber compound, through a change in its chemical structure (for example, cross-linking), becomes less plastic and more resistant to swelling by organic liquids and elastic properties are conferred, improved, or extended over a greater range of temperature.

Warm roof assembly: a roof assembly configured with each component placed immediately on top of the preceding component; each component is in contact with the adjacent component. No space is provided for ventilation of the roof assembly. Also known as a "compact" roof assembly.

Wash coat: a primer, typically provided on the back side of painted metal products to help protect the underlying metal from wear and corrosion.

Water cure: a method of curing a material, such as concrete, by applying a fine mist of water over the surface to control the rate of moisture evaporation from the material.

Water cutoff: see Cutoff.

Water-shedding: the ability of individual, overlapping components to resist the passage of water without hydrostatic pressure.

Water stop: a diaphragm used across a joint as a sealant, usually to prevent the passage of water.

Water table: the level within the ground, below which the soil is saturated with water.

Water vapor transmission: a measure of the rate of transmission of water vapor through a material under controlled laboratory conditions of temperature and humidity. Customary units are grains/h·ft^2.

Waterproof: the quality of a membrane, membrane material, or other component to prevent water entry.

Waterproofing: treatment of a surface or structure to prevent the passage of water under hydrostatic pressure.

Wear course: the top layer of surfacing that carries pedestrian or vehicular traffic. Sometimes referred to as wearing surface.

Wearing surface: see Wear course.

Weatherproof: the ability of a membrane or roof covering to prevent the passage of water with a limited amount of hydrostatic pressure.

Weep holes: small openings whose purpose is to permit drainage of water that accumulates inside a building component (e.g., a brick wall, skylight frame, etc.).

Weld: to join pieces of metal together by heat fusion.

Wet: a condition where free water is present in a substance.

Wet bulb temperature: the temperature of air as registered by a thermometer whose bulb is covered by a water wetted wick.

Wet film thickness: the thickness, expressed in mils, of a coating or mastic as applied but not cured. For comparison, see Dry film thickness.

Wicking: the process of moisture movement by capillary action.

Wind clip: a steep-slope roofing attachment device that fits over the butt end of tile, slate and stone to help secure individual roofing units from wind uplift.

Wind load: force exerted by the wind on a structure or part of a structure.

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

Wire tie system: a system of attachment for steep-slope roofing units (e.g., tile, slate and stone) using fasteners (nails and/or screws) in conjunction with wire to provide a concealed fastening system.

Work slab: see Mud slab.

Woven valley: a method of valley construction in which shingles or roofing from both sides of the valley extend across the valley and are woven together by overlapping alternate courses as they are applied.

Wythe: a masonry wall, one masonry unit, a minimum of two inches thick.

Yield: in SPF-based roofing, the volume of foam per unit weight, normally expressed as board feet per pound or board feet per 1000 pounds.

Z section: a member formed in the shape of a “Z” from coiled steel stock.

Zinc: a hard bluish white metal, brittle at normal temperatures, very malleable and ductile when heated; not subject to corrosion; used for galvanizing sheet steel and iron, in various metal alloys, and as an oxide for white paint pigment.