

The NRCA Roofing Manual:

Architectural Metal Flashing, Condensation and Air Leakage Control, and Reroofing

2014

Includes January 2016 Updates



by unit vapor pressure difference between two specific surfaces (values in reference sources are quoted for specific material thicknesses) under specified temperature and humidity conditions. The English (inch-pound) unit of measurement for permeance is (grains)/(h·ft²·in. Hg), which is commonly referred to as “perm” units.

phased application: (1) The installation of a roof or waterproofing system during two or more separate time intervals or different days. Applications of surfacings at different time intervals are typically not considered phased application. See “surfacing.” (2) A roof system not installed in a continuous operation

phenolic foam: A closed-cell, rigid, thermosetting foam insulation product with an orange or light-red foam core. Facer materials include corrugated cellulose, aluminum foil and fiberglass mat. See “insulation.” Phenolic foam roof insulation can contribute to corrosion of steel roof decks because of leaching out of acidic compounds that takes place when the phenolic foam roof insulation contacts moisture.

pigment: An insoluble compounding material used to impart color

PIMA: Polyisocyanurate Insulation Manufacturers Association

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

pitch: See “coal tar” or “roof slope.”

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

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 it is intended for use on relatively low slopes, not vertical surfaces. See “asphalt roof cement” and “flashing cement.”

plasticizer: Liquid or solid additives used to impart flexibility to a hard, rigid polymer, such as PVC or nitrocellulose

plasticizer migration: In some thermoplastic roof membranes, the loss of plasticizer chemicals from the membrane resulting in shrinkage and embrittlement of the membrane

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

plywood: A flat panel built up of sheets of wood called veneers, united under pressure by a bonding agent to create a panel with an adhesive bond between plies as strong as or stronger than the wood. Plywood is constructed of an odd number of layers with grain of adjacent layers perpendicular. Layers may consist of a single ply or two or more plies laminated with parallel grain direction. Outer layers and all odd-numbered layers generally have the grain direction oriented parallel to the long dimension of the panel.

PMR: See “protected membrane roof (PMR).”

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

polyisocyanurate foam: A cellular, unfaced, preformed rigid thermal insulation produced by the polymerization of polyisocyanates in the presence of polyhydroxyl compounds, catalysts, cell stabilizers and blowing agents; classified in accordance with ASTM C591

polyisocyanurate foam board: A thermal insulation composed of polyisocyanurate foam with adhered facers; commonly called “iso” or “isoboard”; classified in accordance with ASTM C1289

polymer: A macromolecular material formed by the chemical combination of monomers having the same or different chemical composition

polymer-modified bitumen: (1) A bitumen modified by including one or more polymers (e.g., atactic polypropylene, styrene butadiene styrene); (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

polymeric methylene diphenyl diisocyanate (PMDI): See “methylene diphenyl diisocyanate (MDI).”

polymerization: A chemical reaction in which monomers are linked together to form polymers

polyol: A polyhydric alcohol (one containing three or more hydroxyl groups); the main ingredient of the resin component (B-component or B-side) of polyisocyanurate and polyurethane compounds. See “resin (1).”

polypropylene: A polymer prepared by the polymerization of propylene as the sole monomer

polyurethane: A polymer prepared by the reaction of an organic diisocyanate with compounds containing hydroxyl groups (polyols). Polyurethanes, or urethanes as they are sometimes called, may be thermosetting, thermoplastic, rigid or soft and flexible, cellular or solid; they can be aliphatic or aromatic. See “aliphatic polyurethane” and “aromatic polyurethane.”

polyurethane foam (cellular polyurethane): Insulation composed principally of the catalyzed reaction product of polyisocyanate and polyhydroxy compounds, processed usually with fluorocarbon gas to form a rigid foam having a predominately closed-cell structure. It is sprayed-in-place or preformed into boards. See “insulation.”

polyurethane coating: A one- or two-part solvent-based coating that contains polyisocyanate monomer and a hydroxyl containing resin, that reacts during cure to form elastomeric coating

polyvinyl chloride (PVC): A synthetic thermoplastic polymer prepared from vinyl chloride. 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.

polyvinylidene fluoride (PVDF): A highly nonreactive thermoplastic fluoropolymer. PVDF, known by the registered trade names of Kynar 500® and Hylar 5000,® is used as the principal ingredient in high-quality paints and protective coatings for metals, including architectural sheet metal and metal roofing applications. PVDF coatings have good gloss and color retention and are reported to resist chalking, cracking and fading.

polystyrene: A polymer prepared by the polymerization of styrene as the sole monomer

ponding: The excessive accumulation of water at low-lying areas on a roof that remains more than 48 hours after precipitation under conditions conducive to drying

popcorn surface texture: In spray polyurethane foam 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.

Portland cement: A hydraulic (sets and hardens by chemical reaction with water and is capable of doing so under water) cement used for making concrete and grout. Portland cement is a mixture that consists of calcium carbonate and clay-like minerals or other silica-, alumina- and iron-oxide bearing materials; various types are formulated and manufactured.

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 of rain during conditions conducive to drying

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

pour coat: See “flood (pour) coat.”

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

pressure-sensitive: A term used to describe a category of adhesives that in dry (solvent-free) form are tacky at room temperature and adhere to a variety of dissimilar surfaces when contact is promoted by application of pressure. Pressure-sensitive adhesives do not require activation by an energy source such as heat.

prestressed concrete: Concrete in which the reinforcing cables, wires or rods 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

primary drainage: Drainage devices, such as drains or scuppers, that provide for the direct removal of water from a waterproofing system

or saturated—water vapor pressure at the same temperature, expressed as a percentage

replacement: The process of removing the existing roof covering, repairing any damaged substrate and installing a new roof covering; also known as “tear-off and replacement”

reroofing: The process of re-covering or tearing off and replacing an existing roof covering. See “re-covering” and “replacement.”

resin: (1) In spray polyurethane foam roofing, the B-component (B-side). This component contains a catalyst, blowing agent, fire retardants, surfactants and polyol. It is mixed with the A-component (A-side) to form polyurethane; (2) in plastics manufacturing, any polymer that is a basic material for plastics; (3) in grouting, a material that usually constitutes the base of an organic grout system

retrofit: The modification of an existing building or facility to include new systems or components

ridge: Highest point on a roof, represented by a horizontal line where two roof areas intersect, running the length of the area

ridge board: A horizontal board in wood frame construction at the upper end of the common rafters to which the rafters are nailed

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 or shingles, 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., that 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: See “area divider.”

roof assembly: An assembly of interacting roof components including the roof deck, air or vapor retarder (if present), insulation and membrane or primary roof covering designed to weatherproof a structure

roof cement: See “asphalt roof cement” and “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 units, exhaust fans, skylights, etc., on a roof

roof overhang: A roof extension beyond the exterior wall of a building

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 in degrees.

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 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, and can be, or already is, modified to a state in which it is essentially insoluble (but can swell) in boiling solvent such as benzene, methyl ethyl ketone, and ethanol-toluene azeotrope (mixture of a composition that is unchanged by distillation)

run: Horizontal dimension of a slope

rust: (1) A reddish material, primarily hydrated iron oxide; a corrosion product formed on iron or its alloys, resulting from exposure to a humid atmosphere or chemical attack; (2) a special case of corrosion that deteriorates or alters the original surface condition

service life: (1) The period of time a building component or system will function successfully without replacement or excessive repair, assuming reasonable or expected periodic maintenance is performed; (2) the number of years of service a material, system or structure will provide before rehabilitation or replacement is required

shading: Slight differences in surfacing color, such as shingle granule coloring, that may occur as a result of manufacturing operations

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 contact plane

shelf life: The maximum time interval during which a material may be stored and remain in a usable condition according to the material manufacturer; usually related to storage conditions

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

shrinkage: A decrease in one or more dimensions of an object or material

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

silicone coating: A liquid-applied elastomeric coating; the principal polymer in the dispersion contains more than 95 percent silicone resin.

single-component (coating or foam): Polyurethane or silicone material that does not require mixing of "A-component" and "B-component"

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

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

single tees: Structural precast prestressed concrete members of a T-shaped cross-section used as precast roof and floor deck systems

SJI: Steel Joist Institute

skin: The dense film portion on the surface of a liquid coating or mastic

skinning: Function of the time necessary to form a dense film on the surface of a liquid coating or mastic to the extent that the material is unaffected by a water spray

skylight: An opening in a roof that is covered with a transparent or translucent material; used to admit diffuse light to the space below; commonly mounted on a framed curb

slag: (1) A hard aggregate that is left as a residue from blast furnaces; may be used as a surfacing material on certain (typically bituminous) roof membrane systems. See "blast furnace slag"; (2) the fused agglomerate which separates in metal smelting and floats on the surface of the molten metal

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

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 no adhesion occurs between them and to prevent possible damage from chemical incompatibility, wearing or abrasion of the membrane; also called a "separator layer" and "separator sheet"

slippage: Relative lateral movement of adjacent components of a roof membrane. It occurs mainly in roof membranes on a slope, sometimes exposing the lower plies or even the base sheet to the weather.