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Standard Terminology Relating to Roofing, Waterproofing, and Bituminous Materials¹

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1. Referenced Documents

1.1 ASTM Standards:

- C 33 Specification for Concrete Aggregates²
- C 591 Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation³
- C 1289 Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board³
- D 312 Specification for Asphalt Used in Roofing⁴
- D 450 Specification for Coal-Tar Pitch Used in Roofing, Dampproofing, and Waterproofing⁴
- D 698 Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³(600 kN-m/m³))⁵
- D 727 Test Method for Kerosine Number of Roofing and Flooring Felt by the Vacuum Method⁶
- D 1557 Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³(2,700 kN-m/m³))⁵
- D 2822 Specification for Asphalt Roof Cement⁴
- D 4022 Specification for Coal Tar Roof Cement, Asbestos Containing⁴
- D 4586 Specification for Asphalt Roof Cement, Asbestos-Free⁴

2. Terminology

2.1 Definitions:

accelerated weathering, v —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.

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

alligatoring—the cracking of the surfacing bitumen on a built-up roof, producing a pattern of cracks similar to an alligator's hide; the cracks may not extend through the surfacing bitumen.

anionic emulsion—an emulsion in which the emulsifying system establishes a predominance of negative charges on the discontinuous phase.

application rate—the quantity (mass, volume or thickness) of material applied per unit area.

artificial weathering, v —exposure to conditions, which may be cyclic, involving temperature, relative humidity, radiant energy, and/or any other conditions or pollutants found in the atmosphere in various geographical areas, which may accelerate changes in properties of materials over those of natural weather conditions.

asbestos—a group of natural fibrous impure silicate materials.

asphalt—a dark brown to black cementitious material in which the predominating constituents are bitumens which occur in nature or are obtained in petroleum processing.

asphalt, air blown—an asphalt produced by blowing air through molten asphalt at an elevated temperature to raise its softening point and modify other properties.

asphaltene—a high molecular weight hydrocarbon fraction precipitated from asphalt by a designated paraffinic naphtha solvent at a specified temperature and solvent-asphalt ratio.

DISCUSSION—The asphaltene fraction should be identified by the temperature and solvent-asphalt ratio used.

asphalt felt—an asphalt-saturated felt.

asphalt, steam blown—an asphalt produced by blowing steam through molten asphalt to modify its properties.

asphaltite—a natural asphalt found below ground level.

asphalt mastic—a mixture of asphaltic material and graded mineral aggregate that can be poured when heated, but requires mechanical manipulation to apply.

asphalt rock (rock asphalt)—a naturally occurring rock formation, usually limestone or sandstone, containing throughout its mass a minor amount of asphalt.

asphalt roof cement, n —a trowelable mixture of asphalt, solvents, mineral stabilizers, fillers or fibers, or both. See Specifications D 2822 and D 4586.

asphalt roof cement, n —see *flashing cement*.

backnailing—the practice of blind-nailing roofing felts to a substrate in addition to hot-mopping to prevent slippage.

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² *Annual Book of ASTM Standards*, Vol 04.02.

³ *Annual Book of ASTM Standards*, Vol 04.06.

⁴ *Annual Book of ASTM Standards*, Vol 04.04.

⁵ *Annual Book of ASTM Standards*, Vol 04.08.

⁶ *Annual Book of ASTM Standards*, Vol 15.09.

bald roof—See **smooth-surfaced roof**.

base ply—the bottom or first ply in a built-up roofing membrane when additional plies are to be subsequently installed.

base sheet—a product intended to be used as a base ply in a built-up roofing system.

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 asphaltites;

(2) a generic term used to denote any material composed principally of bitumen.

bitumen trap—See **pitch pocket**.

bituminized, *adj*—impregnated with bitumen. Example: bituminized fiber pipe.

bituminous, *adj*—containing or treated with bitumen. Examples: bituminous concrete, bituminous felts and fabrics, bituminous pavement.

bituminous emulsion—(1) a suspension of minute globules of bituminous material in water or in an aqueous solution;

(2) a suspension of minute globules of water or of an aqueous solution in a liquid bituminous material (invert emulsion).

bituminous grout—a mixture of bituminous material and fine sand that will flow into place without mechanical manipulation when heated.

blast-furnace slag—the nonmetallic product, consisting essentially of silicates and aluminosilicates of calcium and other bases, that is developed in a molten condition simultaneously with iron in a blast furnace.

blind nailing—the use of nails that are not exposed to the weather in the finished roofing.

blister—(1) a raised portion of a roofing membrane resulting from local internal pressure;

(2) the similarly formed protuberances in coated prepared roofing.

blocking—(1) wood built into a roofing system above the deck and below the membrane and flashing to (a) stiffen the deck around an opening, (b) act as a stop for insulation, (c) serve as a nailer for attachment of the membrane or flashing.

(2) wood cross-members installed between rafters or joists to provide support at cross-joints between deck panels.

(3) cohesion or adhesion between similar or dissimilar materials in roll or sheet form that may interfere with the satisfactory and efficient use of the material.

blueberry—See **strawberry**.

bond—the adhesive and cohesive forces holding two roofing components in intimate contact.

brooming—embedding a ply by using a broom to smooth it out and ensure contact with the adhesive under the ply.

built-up roofing—a continuous, semiflexible membrane consisting of plies of saturated felts, coated felts, fabrics or mats assembled in place with alternate layers of bitumen, and surfaced with mineral aggregate, bituminous materials, or a granule surfaced sheet (abbreviation, BUR).

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—See **flashing**.

cap sheet—a granule-surfaced coated felt used as the top ply of a built-up roofing membrane.

cationic emulsion—an emulsion in which the emulsifying system establishes a predominance of positive charges on the discontinuous phase.

caulking—a composition of vehicle and pigment, used at ambient temperatures for filling joints, that remains plastic for an extended time after application.

channel mopping—See **mopping**, (3) *strip*.

coal tar—a dark brown to black cementitious material produced by the destructive distillation of coal.

coal tar roof cement, *n*—a trowelable mixture of processed coal tar base, solvents, mineral fillers or fibers, or both. See Specification D 4022.

coal-tar felt—a felt that has been saturated with refined coal tar.

coal-tar pitch—a dark brown to black, solid cementitious material obtained as residue in the partial evaporation or distillation of coal tar.

coated sheet (or felt)—(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.

coke-oven tar—See **coal tar**.

cold-process roofing—a continuous, semiflexible membrane consisting of plies of felts, mats, or fabrics laminated on a roof with alternate layers of roof cement and surfaced with a cold-applied coating.

concealed membrane waterproofing, *n*—also referred to as **structural slab waterproofing**; (1) for below grade: refers to a form of waterproofing where the membrane is applied to the mud mat and later covered with a topping, usually concrete, to act as a wearing layer or course, and (2) for elevated structural concrete deck: applied over the structural surface and covered/concealed by other components such as a topping slab, pavers, ballast, pavement, and plantings.

condensation—the conversion of water vapor or other gas to liquid as the temperature drops or atmospheric pressures rises. (See also **dew point**).

conditioning, *v*—the storage of a 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. $C = W/m^2 \cdot K$ ($C = \text{Btu}/\text{h} \cdot \text{ft}^2 \cdot ^\circ\text{F}$).

conductivity, thermal—the thermal transmission, by conduction only, in unit time through unit area between two isothermal surfaces of an infinite slab of a homogeneous material of unit thickness, in a direction perpendicular to the surface, when unit temperature difference is established

between the surfaces. $k = W/m \cdot K$ ($k = \text{Btu} \cdot \text{in.} / \text{h} \cdot \text{ft}^2 \cdot ^\circ\text{F}$).

cone penetration—See **penetration**.

coping—a covering on top of a wall exposed to the weather, usually sloped to carry off water.

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

coverage—the surface area to be continuously covered by a specific quantity of a particular material.

creep—the time-dependent part of a strain resulting from stress.

cricket, n—a construction to divert water around or away from a chimney, curb, wall, expansion joint, or other penetration. (See **saddle**).

crushed stone—the product resulting from the artificial crushing of rocks, boulders, or large cobblestones, substantially all faces of which have resulted from the crushing operation.

cutback—solvent-thinned bitumen used in cold-process roofing adhesives, flashing cements, and roof coatings.

cutoff—a detail designed to prevent lateral water movement into the insulation where the membrane terminates at the end of a day's work, or used to isolate sections of the roofing system. It is usually removed before the continuation of the work.

damproofing—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 also **slope**).

dead level asphalt—a roofing asphalt conforming to the requirements of Specification D 312, Type I.

dead level roofing—a roofing system applied on a surface with a 0 to 2 % incline.

deck—the structural surface to which the roofing or waterproofing system (including insulation) is applied.

direction change—a change in the orientation of the principal dimension or of the support of adjoining units of the roofing system.

double pour—to apply two layers of aggregate and bitumen to a built-up roof.

dry felt—(1) see felt;

(2) a felt which has not been saturated with bitumen.

edge stripping—application of felt strips cut to narrower widths than the normal felt-roll width to cover a joint between flashing and built-up roofing.

edge venting—the practice of providing regularly spaced protected openings at a roof perimeter to relieve water vapor pressure in the insulation.

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.

embedment—(1) the process of pressing a felt, aggregate, fabric, mat, or panel uniformly and completely into hot bitumen or adhesive to ensure intimate contact at all points;

(2) the process of pressing granules into coating in the

manufacture of factory-prepared roofing, such as shingles.

emulsion—an intimate mixture of bitumen and water, with uniform dispersion of the bitumen or water globules, usually stabilized by an emulsifying agent or system.

envelope—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.

equilibrium moisture content—(1) the moisture content of a material stabilized at a given temperature and relative humidity, expressed as percent moisture by weight;

(2) the typical moisture content of a material in any given geographical area.

equiviscous temperature (EVT), n—the temperature at which a bitumen attains the proper viscosity for built-up membrane application. EVT may or may not be applicable to polymer modified bituminous sheet materials. (See **EVT for asphalt** and **EVT for coal tar pitch**).

DISCUSSION—In England, EVT is the temperature corresponding to a standard efflux time from a road tar viscometer.

equiviscous temperature for asphalt, n—the equiviscous temperature (EVT) for roofing asphalt (Specification D 312, Type I, II, III, or IV) is as follows: (1) *mop application*—the temperature at which the asphalt's apparent viscosity is 125 cP. (2) *mechanical spreader application*—the temperature at which the asphalt's apparent viscosity is 75 cP. See **equiviscous temperature** and **EVT application range**.

equiviscous temperature for coal tar—the equiviscous temperature (EVT) for roofing coal tar (Specification D 450, Type I or III) is the temperature at which the coal tar's apparent viscosity is 25 cP. See **equiviscous temperature** and **EVT application range**.

EVT application range, n—the bitumen application temperature range. The range is from 25°F below the EVT to 25°F above the EVT (50°F span). The temperature is measured in the mop cart or mechanical spreader just prior to the application of bitumen to the substrate.

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

exposure—(1) the transverse dimension of a roofing element not overlapped by an adjacent element in any roofing system. The exposure of any ply in a membrane may be computed by dividing the felt width minus 51 mm (2 in.), by the number of shingled plies; thus, the exposure of a 914-mm (36-in.) wide felt in a shingled, four-ply membrane should be 216 mm (8½ in.);

(2) the time during which a portion of a roofing element is exposed to the weather.

extra-steep asphalt— See **super-steep asphalt**.

fabric, n—a woven or nonwoven cloth of organic or inorganic filaments, threads, or yarns.

factory square—10 m² (108 ft²).

- fallback**—a reduction in bitumen softening point, sometimes caused by refluxing or overheating in a relatively closed container. (See also **softening point drift**).
- 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 vegetable fibers (organic felts), asbestos fibers (asbestos felts) or glass fibers (glass fiber felts); other fibers may be present in each type.
- felt layer**—(1) a machine used for applying bitumen and built-up roofing felts;
(2) See **ply**.
- felt mill ream**—the mass in pounds of 480 ft² of dry, unsaturated felt, also termed “point weight.”
- fine mineral surfacing**—water-insoluble inorganic material, more than 50 % of which passes the 500- μ m (No. 35) sieve, used on the surface of roofing.
- finger blisters**—finger shaped blisters or wrinkles in the plies of a built-up roofing or waterproofing membrane.
- finger wrinkles*—See **finger blisters**.
- fishmouth**—(1) a half-cylindrical or half-conical opening formed by an edge wrinkle or failure to embed a roofing felt;
(2) *in shingles*, a half-conical opening formed at a cut edge.
- flashing**—the system used to seal membrane edges at walls, expansion joints, drains, gravel stops, and other places where the membrane is interrupted or terminated. Base flashing covers the edges of the membrane. Cap or counterflashing shields the upper edges of the base flashing.
- flashing cement**—a trowelable mixture of cutback bitumen and mineral stabilizers including asbestos or other inorganic fibers.
- flat asphalt**—a roofing asphalt conforming to the requirements of Specification D 312, Type II.
- flood coat**—the top layer of bitumen used to hold the aggregate on an aggregate-surfaced, built-up roofing membrane.
- fluid-applied elastomer**—an elastomeric material, fluid at ambient temperature, that dries or cures after application to form a continuous membrane. Such systems normally do not incorporate reinforcement.
- flux**—a bituminous material used as a feed stock for further processing and as a material to soften other bituminous materials.
- “free carbon” in tars**—the hydrocarbon fraction that is precipitated from a tar by dilution with carbon disulfide.
- glass felt**—glass fibers bonded into a sheet with resin and suitable for impregnation 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 in a smooth-surfaced built-up roof assembly;
(2) a thin protective coating of bitumen applied to the lower plies or top ply of a built-up membrane, when application of additional felts, or the flood coat and aggregate surfacing are delayed.
- granule*—See **mineral granules**.
- gravel**—coarse, granular aggregate, with pieces larger than sand grains, resulting from the natural erosion of rock.
- gravel in**—to spread aggregate into hot bitumen on the surface of the roofing membrane.
- 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.
- headlap**—the minimum distance, measured at 90 deg to the eave along the face of a shingle or felt as applied to a roof, from the upper edge of the shingle or felt, to the nearest exposed surface.
- heat exposure**, *v*—the process of subjecting a specimen to an elevated temperature at atmospheric pressure for a specified period of time with the intent of determining properties by subsequent testing.
- holiday**—an area where a liquid-applied material is missing.
- “hot stuff” or “hot”**—a roofer’s term for hot bitumen.
- hydrokinetic roof system**, *n*—a roof system that depends on quick drainage via water shedding to prevent water entry into or through the system.
- hydrostatic roof system**, *n*—a roof system that is capable of holding water without allowing water to penetrate the system.
- hygroscopic**—attracting, absorbing, and retaining atmospheric moisture.
- 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, an ice dam may cause ice and water to back up under shingles or other roofing materials.
- impregnate**, *v*—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.
- incline**—the slope of a roof expressed in percent or in the number of vertical units of rise per horizontal unit of run.
- inorganic**, *adj*—being or composed of matter other than hydrocarbons and their derivatives, or matter that is not of plant or animal origin.
- iso*—in roofing, see **polyisocyanurate foam board**.
- isoboard*—See **polyisocyanurate foam board**.
- insulation*—See **thermal insulation**.
- kerosine number**—the millilitres of kerosine held per 100 g of felt as determined by Test Method D 727. To obtain the percentage saturating capacity of the felt for any bituminous saturant, obtain the specific gravity of the saturant and multiply that figure by the kerosine number of the felt.
- knot**—an imperfection or nonhomogeneity in materials used in fabric construction, the presence of which causes surface irregularities.
- liquid bituminous material**—one having a definite volume but no definite form, except as provided by its container. It has a viscosity of 0.1 to 1×10^5 cSt (mm²/s) at 40°C. This does not include powders or granular materials.
- loose-laid membrane**—a ballasted roofing membrane that is attached to the substrate only at the edges and penetrations through the roof.
- lot**—in roofing, (1) production lot—all material produced in one eight-hour shift of the same type (and color when applicable);