

SECTION 14: GLOSSARY AND DEFINITIONS

The following definitions sometimes are not as strict as those which would be applied by a physicist, but are phrased in the terms familiar to and commonly used by engineers and the people of the construction industry. Users of this Glossary should note that, in many cases, words are used in the connotations familiar to the industry, and the definitions are restricted to this limited usage.

ABSORPTION	That property of a material which enables it to retain liquids (in either liquid or vapour form) upon its surfaces, both internal and external.
AFTERGLOW	The incandescence in a material after removal of an external flame or fire, or after an integral flaming has been extinguished.
AIR BARRIER	A continuous network of materials and joints providing air tightness, with adequate strength and stiffness to not deflect excessively under air pressure differences, to which it will be subjected in service. It can be comprised of a single material or a combination of materials to achieve the required performance requirements.
ALLIGATORING	A term describing the action of a coating or mastic when it cracks into large segments. When the action is fine and incomplete it is usually referred to as "checking".
AMBIENT TEMPERATURE	The temperature of the medium, usually air, surrounding the object under consideration.
ASBESTOS	A group of fibrous minerals which occur as small veins in the massive body of natural hydrous silicates of serpentine of amphibole, and have heat-, fire-, and solvent-resistant properties. Used as a reinforcement in the manufacture of mastics.
ASPHALT EMULSION	A colloidal dispersion of petroleum asphalt in water. The emulsifying agent may be a colloidal clay or a chemical soap.
BATT	A piece of insulation of the flexible type, cut into easily handled sizes, square or rectangular in shape, usually 600 mm or 1200 mm long and usually with a vapour retarder on one side, and with, or without, a container sheet on the other side.
BEDDING COMPOUND	A plastic material, composed of various ingredients, spread on the substrate and used as a medium in which to embed the insulation layer. The compound acts as a cushion, anti-abrasive, and adhesive.
BLANKET	Insulation, of the flexible type, formed into sheets or rolls, usually with a vapour retarder on one side and with or without a container sheet on the other side.

BLEEDING	The diffusion of colouring matter through a coating from the substrate. (Such as bleeding of asphalt mastic through a topcoat of paint.)
BLOCK	Rigid or semi-rigid insulation formed into sections, rectangular both in plan and cross section, usually 900 mm to 1200 mm long, 150 mm to 600 mm wide, and 25 mm to 150 mm thick.
BOND STRENGTH	The unit load applied in tension, compression, peel, impact, cleavage, or shear required to break an adhesive assembly with failure occurring in or near the plane of the bond.
BRITISH THERMAL UNIT (BTU)	Originally the amount of heat necessary to raise one pound of water one degree Fahrenheit at standard atmospheric pressure. Now, by international agreement has been established as 778.26 ft lbs.
CANVAS	A light, plain weave, coarse, cotton cloth with hard twisted yarns, usually not more than 271 g/sq m (8 oz. per square yard).
CAPILLIARITY	That property of a material which will enable it to suck a liquid up into or through itself, with the driving force of the liquid being its surface tension.
CAULKING COMPOUND	A soft, plastic material, consisting of pigment and vehicle, used for sealing joints in buildings, and other structures, where normal structural movement may occur.
CENTIGRADE	The temperature measuring scale in which the ice point of water is taken at 0° and the steam point at 100°. The absolute zero on this scale is -273.2°.
CHEMICALLY FOAMED PLASTIC	A cellular plastic produced by gases generated from chemical interaction of constituents.
CHLORINATED SOLVENT	An organic chemical liquid characterized by a high chlorine content and used in coating products to impart non-flammability.
CLOSED-CELL FOAMED PLASTIC	A cellular plastic in which there is a predominance of non-interconnecting cell.
COATING	A liquid, or semi-liquid, protective finish capable to application to thermal thickness, less than 30 mils (0.030 inches).
COEFFICIENT OF EXPANSION (CONTRACTION)	The increase (decrease) in length of a material, one unit long, due to the increase (decrease) of its temperature one degree. In the British System the unit is usually one foot, and the temperature Fahrenheit.
COMBUSTIBLE	Capable of uniting with air or oxygen in a reaction initiated by heating, accompanied by the subsequent evolution of heat and light. Capable of burning.

COMBUSTIBILITY	That property of a material which measures its tendency to burn. Combustibility is measured in accordance to CAN4-S114 and is a measurement of the non-combustibility of a material. Combustibility should not be confused with the arbitrary terms of "Flame Spread Index" and "Smoke Density Index" according to CAN/ULC-S102-2003, as they are separate material properties and measured differently.
COMPACTION OR SETTLING	The property of the blankets, or batts, which measures their change in density and thickness resulting from loading, or vibration, with a resultant change of thermal efficiency.
CONDENSATION	The act of water vapour turning into liquid water upon contact with a surface at a lower temperature than the dew point of the vapour.
CONCEALED SPACES	Spaces not generally visible after the project is completed such as furred spaces, pipe spaces, pipe and duct shafts, spaces above ceilings, unfinished spaces, crawl spaces, attics and tunnels.
CONDUCTION	The transfer of energy within a body, or between two bodies in physical contact, from a higher temperature region to a lower temperature region by tangible contact.
COVERAGE-WET	The property of a material which measures the amount of material necessary to cover a given area to obtain a specific dried or cured thickness.
CREEP	The dimensional change with time of a material under load apart from, and following, the initial instantaneous elastic or rapid deformation.
CRYOGENIC	Pertaining to the extremely low temperatures, such as the liquefaction points of gaseous elements, usually below -75°C on down to absolute zero.
CURING AGENT	An additive incorporated in a coating or adhesive resulting in increased chemical activity between the components, with an increase or decrease in the rate of cure.
CURVED SEGMENTAL BLOCK	A piece of rigid insulation, rectangular in plan, and the sector of a tube, in cross section, molded or cut from block of the proper thickness
DEWPOINT	The temperature at which the quantity of water vapour in a material would cause saturation, with resultant condensation of the vapour into liquid water by any further reduction of temperature.
DRYING TIME (ADHESIVES)	Time elapsed since bonding at the optimum time when no further increase in bond strength is realized
DRYING TIME FINISHES	Time elapsed after which no further significant changes take place in appearance or performance properties, due to drying.

EFFLORESCENCE (BLOOM)	A white powdery substance occurring on the surface of coated insulation (products, caused by the migration of soluble salts from the insulation, followed by precipitation and carbonation.
EMULSION	Strictly stated, a colloidal suspension of one liquid in another.
EXPLOSIVE LIMITS	In the case of solvent vapours which form flammable mixtures with air or oxygen, there is a minimum concentration of vapour in air or oxygen below which propagation of flame does not occur on contact with a source of ignition. There is also a maximum proportion of vapour or gas in air, above which propagation of flame does not occur. These boundary-line mixtures of vapour with air, which if ignited, will just propagate flame, are known as the "lower and upper flammable" usually expressed in terms of percentage by volume of vapour in air.
EXPLOSIVE RANGE	The range of combustible vapour and air mixtures between the upper and lower flammable limits is known as the "flammable range", sometimes referred to as the "explosive range".
FACING	A thin layer on the surface of an insulating product, variously acting as either a vapour retarder, weather-barrier, protector from damage, or a decorative coating.
FAHRENHEIT	The temperature scale of the British System of units in which the ice point of water is assigned the value of 32°, and the steam point the value of 212°, with 180 even divisions between, and corresponding divisions above and below. Absolute zero on this scale is - 459.6°.
FILLER	A relative inert material added to a mastic or coating to modify its strength, permanence, working properties, or other qualities.
FILLET	That portion of an adhesive, mastic coating, or sealant which fills the corner, or angle, where two adherents or surfaces are joined.
FILM	An optional term for sheeting having nominal thickness not greater than 0.25mm (0.010").
FINISHING CEMENT	A mixture of asbestos fibers and bonding clays, water-mixed to a plastic mass on the job, and used on the surface of insulations to provide a medium-hard to hard, even finish.
FIRE POINT TEMPERATURE	The lowest temperature of a material at which it gives off vapour, which, when combined with air near its surface, forms an ignitable mixture at a rate sufficient to support combustion continuously after the external ignition source is removed.
FIRE RESISTANCE	That property of a material which enables it to resist a decomposition or deterioration when exposed to a fire.
FIRE RETARDANCE	That property of a material which delays the spread of fire, either through or over itself.

FISH-MOUTH	A transverse gap between layers of sheet materials caused by warping or bunching of one or both layers.
FLAME SPREAD	The rate, expressed in distance-time, at which a material will propagate flame on its surface. As this is a difficult property to measure in time and distance, the measure is now by flame spread index to enable the comparison of materials by test methods. (CAN/ULC-S102-2003).
FLAMMABLE	That property of a material which permits it to oxidize rapidly and release heat of combustion when exposed to flame or fire, and allows continuous burning after the external ignition source is removed.
FLASH POINT	The lowest temperature of a material at which it gives off vapour, which, when combined with air near its surface, forms an ignitable mixture. Various apparatus is used depending on the type of material to be tested, such as Tagliabue Open or Closed Cup, Cleveland Open or Closed Cup or Pennsky-Martens Closed Tester.
FLEXIBILITY	That property of a material which allows it to be bent (flexed) without loss of strength.
FREEZE-THAW RESISTANCE	The property of a material which permits it to be alternately frozen and thawed - through many cycles - without damage from rupture or cracking.
FUEL CONTRIBUTED	Flammable by-products of fire generated by, and emitted from, a burning object. (Fuel-Contributed.)
GALVANIC CORROSION	Pitting or eating away of one of the metals when two metals of different electric potential are in direct contact, or electrically connected by an electrolyte.
HEAT TRANSFER CEMENT	A soft, plastic material, which under use quickly solidifies to a rock-like hardness, having a high coefficient of heat transfer, which is used to bond tubes, or other heat-conveying devices, to the pipe or equipment to which it is desired to transfer the heat.
HOLIDAY	In a coating application a place not covered by coating compound.
HYGROSCOPICITY	That property of a material which enables it to readily absorb and retain water in either its liquid or vapour state.
INSULATING MASTIC	A premixed soft, plastic material of various consistencies, applied by spray, trowel, brush or palm, which possesses some insulating value in addition to its other vapour retarder or weather-barrier characteristics.
INSULATING CEMENT	A mixture of various fibers and binders, to be mixed with water to form a soft, plastic mass, and used to insulate small irregular surfaces and fill the cracks and crevices between the units insulating larger surfaces.

INSULATION COVER	The cover for a flange, pipe fitting, or valve, composed of the specified thickness insulating material, and preformed into its proper shape before application.
INTUMESCENCE	The process of swelling or expanding on fire exposure to form a cellular charred layer which insulates and retards flaming.
INSULATION SYSTEM	An application of insulation to piping, ductwork or equipment that may include the use of adhesives, mechanical fastenings, coatings, reinforcing fabrics, sealants and metal covering.
INSULATION COATING	A material, or materials, used over insulation or over the weather coating to provide the desired colour or texture for decorative purposes.
JACKET	A covering placed around an insulation to protect it from mechanical damage, and, insofar as it is intrinsically able, from weather, water, ultra violet light, etc.
LAG	A long, narrow piece of rigid insulation, rectangular in plan, trapezoidal in cross section, molded, or cut from block of the proper thickness.
LAGGING	An insulation layer, on a cylindrical surface, composed of lags.
MASTERFORMAT	A standard listing of specification section numbers and titles, used for organizing construction documents in a specification. MasterFormat 2004 is published by Construction Specifications Canada (CSC) and Construction Specifications Institute (CSI-USA).
MASTIC	A relatively thick consistency protective finish capable of application to thermal insulation or other surfaces, usually by spray or trowel, in thick coats, greater than 0.76mm (30 mil).
MINERAL FIBER	A durable fibrous material processed from rock, slag or glass.
MUD CRACKING	A form of alligating, or stress cracking, which may occur during drying in thick applications of water-base mastics or coatings, usually caused by shrinkage from excessive volatile content.
NOISE REDUCTION COEFFICIENT (N.R.C.)	Is an arithmetic average representation of sound absorption coefficients of frequencies from 250 to 2000 Hertz. Refer also to "Sound Absorption Coefficient".
NON-COMBUSTIBLE	A material which will not contribute fuel or heat to a fire to which it is exposed (CAN4-S114-1980(R1997))
NONFLAMMABLE	That property of a material which prevents it from oxidizing rapidly and releasing heat of combustion when exposed to fire or flame.
OPEN-CELL FOAMED PLASTIC	A cellular plastic in which there is a predominance of inter-connected cells.

OPEN TIME MAXIMUM (ADHESIVES)	That open time which corresponds to 90 percent of the optimum strength after the maximum value has been reached.
OPEN TIME MINIMUM (ADHESIVES)	That open time which corresponds to 90 percent of the optimum strength prior to reaching the maximum value.
OPEN TIME OPTIMUM (ADHESIVES)	That open time which gives the optimum strength at a bond age of 24 hours.
ORANGE-PEEL	Uneven surface of a spray-applied coating, somewhat resembling an orange peel.
PENETRATION	The consistency of a mastic material, expressed as the distance that a standard cone vertically penetrates a sample of the material under known conditions of loading, time, and temperature. The units of penetration indicate hundredths of a centimeter.
PERM	The accepted unit of Water Vapour Permeance. Is expressed as 1 grain per square foot, hour, inch of mercury.
PERM-INCH	The accepted unit of Water Vapour Permeability. Is expressed as 1 grain per square foot, hour, inch of mercury, inch of thickness.
PINHOLE	Very small hole through a mastic or coating.
PIT	Small regular or irregular crater in the surface of a plastic, usually with its width approximately of the same order of magnitude as its depth.
POLYSTYRENE	A resin made by polymerization of styrene as the sole monomer.
POT LIFE	The period of time during which an adhesive or coating, after mixing with catalyst, solvent, or other compounding ingredients, remains suitable for use.
PUNKING	The incandescent, or glow, which lingers in some material after any flame, or other evidence of fire, has departed.
PRIMER	The first application of a coating system used to seal or condition the surface for the proper bonding of subsequent layers or coats.
RADIATION	The transfer of energy from a higher temperature body, through space, to another body, or bodies, some distance away at a lower temperature, without raising the temperature of the medium through which the energy passes.
REFLECTANCE	The ratio of the radiant energy reflected by a body to that incident upon it.
REINFORCING MEMBRANE	A loosely woven cloth or fabric of glass or resilient fibres, placed approximately in the centre of the vapour-retarder or weather-barrier to act as reinforcing to the mastic of the barrier.

REINFORCING MESH	Generic term for poultry netting, chicken wire, etc., usually made from galvanized wire woven in 25 mm mesh size. Also available in galvanized and rustless metal alloys.
RELATIVE HUMIDITY	The ratio of the actual pressure of existing water vapour to the maximum possible (saturation) pressure of water vapour in the atmosphere at the same temperature, expressed as a percentage. (See dew point.)
RESILIENT	Capable of recoiling from pressure or shock unchanged or undamaged.
SAG	Excessive flow in material after application to a surface, resulting in "curtaining" or running.
SELF-IGNITION TEMPERATURE (AUTOGENOUS IGNITION)	The lowest temperature of a material which will cause it to ignite without other ignition source.
SELF-EXTINGUISHING	That property of a material which enables it to stop its own ignition after external ignition sources are removed.
SEALER	A substance, composed of various materials, used to retard the passage of water vapour or liquid water into the joint formed by the mating surface of jackets and vapour retarder over insulation. A good sealer will possess relatively little shrinkage. There are several types of sealers, such as non-setting, setting, and heat resisting.
TEMPERATURE LIMITS	The limiting temperatures at a coated surface, within which limits the applied coating will have satisfactory service performance.
SET	To convert into a fixed or hardened state by chemical or physical action.
SHRINKAGE - WET TO DRY	The property of a material which measures the difference in volumetric and linear change which occurs in the drying of insulating cements and mastics.
SIZING	Any of various glutinous materials, used to fill the pores in the surface of a paper, fiber, or cloth.
SKINNING	The formation of a relatively dense film on the surface of a mastic or coating material while stored in containers.
SMOKE DENSITY	The Smoke Density Factor is the amount of smoke given off by the (SMOKE-burning material compared to the amount of smoke given off by DEVELOPED) the burning of a standard material (CAN/ULC-S102-2003.)
SMOKE TOXICITY	The degree of hazard to health of the smoke.
SOFTENING POINT	That temperature at which a material will change its property from firm or rigid to soft or malleable.

SOLIDS CONTENT	<p>The percentage of the non-volatile matter.</p> <p>NOTE: The determined value of non-volatile matter in any adhesive, coating, or sealant will vary somewhat, according to the analytical procedure used. A standard test method must be used to obtain consistent results.</p>
SOLVENT	<p>Any substance, usually a liquid, which dissolves other substances. Normally a liquid organic compound used to make a coating work more freely.</p>
SOUND ABSORPTION COEFFICIENT	<p>Is the decimal fraction representing the absorbed portion of an incident sound wave, when tested in accordance with ASTM C423, #6 mounting (Metal Duct). Refer also to "Noise Reduction Coefficient".</p>
SUBSTRATE	<p>A material upon the surface of which an adhesive or coating is spread.</p>
SURFACE WETTING	<p>The property of a material applied to a substrate which enables it to thoroughly wet the substrate to produce a good bond.</p>
TACK	<p>The property of an adhesive that enables it to form a bond of measurable strength immediately after adhesive and adherent are brought into contact under low pressure.</p>
TAR	<p>Brown or black bituminous material, liquid or semi-solid in consistency, in which the predominating constituents are bitumens obtained as condensates in the destructive distillation of coal, petroleum, oil-shale, wood, or other organic materials, and which yields substantial quantities of pitch when distilled.</p>
TEMPERATURE LIMITS	<p>The upper and lower temperatures at which a material will experience no essential change in its properties.</p>
THERMAL CONDUCTANCE	<p>Thermal conductance (expressed as C) is the amount of heat expressed in BTU transmitted in one hour through one square foot and is applied to specific materials as used, which may be either homogeneous or heterogeneous, for the thickness or type under consideration, for a difference in temperature of one degree F. between the two surfaces of the material.</p> <p>Overall coefficient of heat transmission (expressed as U) is the amount of heat expressed in BTU transmitted in one hour per square foot of wall, floor, roof or ceiling for a difference in temperature of one degree F. between the air on the inside and outside of the wall, floor, roof or ceiling.</p>

Film or surface conductance (expressed as f) is the amount of heat expressed in BTU transmitted from a surface to the air surrounding it or vice versa, in one hour per square foot of the surface for a difference of one degree Fahrenheit. To differentiate between inside and outside surfaces, f_i is used to designate the inside film and f_o for outside film. f_i for ordinary building materials and for still air is about 0.68 and f_o for ordinary building materials and a wind of 15 miles per hour is about 0.17.

Thermal Conductance of an air space (expressed as a) is the amount of heat expressed in BTU transmitted in one hour through an area of one square foot of an air space for a temperature difference of one degree Fahrenheit. "a" for an air space of 19 mm or larger and bounded by ordinary surfaces (not reflective), the average is 1.1

**THERMAL
CONDUCTIVITY**

Thermal Conductivity (expressed as k) is the amount of heat expressed in BTU transmitted in one hour through one square foot of a homogeneous material 25 mm thick for a difference in temperature of one degree Fahrenheit between the two surfaces of the materials.

Note: the value of k will vary with the mean temperature. The value of k will vary with the density of the material when the mean temperature is constant. Therefore, the density and mean temperature are usually given when expressing the k factor for any insulating material.

**THERMAL
INSULATION**

Material having air-filled or gas-filled pockets, void spaces, or heat-reflective surfaces, which, when properly applied, will retard the transfer of heat with reasonable effectiveness under ordinary conditions.

**THERMAL
RESISTANCE**

That property of a material which enables it to withstand the passage passage of heat through it, due to a temperature difference between its two opposite surfaces. Resistance (expressed as R) is numerically equal to the reciprocal of the conductance.

$$R = 1 / C \quad R = 1 / f \quad R = 1 / a \quad R = 1 / u \quad i \quad 0$$

To obtain the resistance when k is given $R = x / k$ when x is the thickness of the insulation

The overall resistance of a wall, floor or roof is the sum of the resistances of each part.

**THERMAL SHOCK
RESISTANCE**

That property of a material which enables is to retain its shape and not distort, crack, or shatter, due to a sudden change in its temperature.

THERMOPLASTIC

Capable of being repeatedly softened by increase of temperature.

Note: Thermoplastic applies to those materials whose change upon heating is substantially physical.

THERMOSET	A plastic or coating which, when cured by application of heat or chemical means, changes into a substantially infusible and insoluble product.
THIXOTROPY	The property of decreasing in consistency upon being sheared or worked, followed by a gradual recovery of consistency when the shearing stress is removed.
TOXICITY	The degree of hazard to health.
VAPOUR RETARDER	A material or materials, which when installed on the high vapour pressure side of a retarder material, retards the passage of moisture vapour to the lower vapour pressure side.
VAPOUR DENSITY	The relative density of a vapour or gas (with no air present) as compared with air. A figure less than 1 indicates that a vapour is lighter than air, and a figure greater than 1 that a vapour is heavier than air.
VAPOUR MIGRATION	That property of a material which measures the rate at which water vapour will penetrate it, due to vapour pressure differences (PERMEABILITY) between its surfaces.
VAPOUR PRESSURE	The gas pressure exerted by the water vapour present in the air.
VEHICLE	The liquid portion of a mastic or coating. Anything that is dissolved in the liquid portion is part of the vehicle.
VISCOSITY	<p>The property of resistance to flow exhibited within the body of a material.</p> <p>Note: This property can be expressed in terms of the relationship between applied shearing stress and resulting rate of strain in shear. Viscosity is usually taken to mean "Newtonian Viscosity", in which case the ratio of shearing stress to the rate of shearing strain is constant. In non-Newtonian behaviour, which is the usual case with adhesives, coatings, and sealants, the ratio varies with the shearing stress. Such ratios are often called the "apparent viscosity's" as the corresponding shearing stresses.</p>
WATER ABSORPTION	The increase in weight of a test specimen, expressed as a percentage of its dry weight after immersion in water for a specified time.
VAPOUR	Water in a gaseous state.
WATER VAPOUR PERMEABILITY	The water vapour permeability of a homogeneous material is a property of the substance. This property may vary with conditions of exposure. The average permeability of a specimen is the product of its permeance and thickness. An accepted unit of permeability is a perm inch, or 1 grain per square foot, hour, inch of mercury per inch of thickness. The test conditions must be stated.

**WATER VAPOUR
TRANSMISSION
(WVT)**

The rate of water vapour transmission of a body between two specified parallel surfaces is the time rate of water vapour flow normal to the surfaces under steady condition through unit area, under the conditions of test. An accepted unit of WVT is 1 grain per square foot, hour (with the test conditions stated).

**WEATHER-
COATING**

A material or materials, which, when installed on the outer surface of thermal insulation, protects the insulation from the ravages of weather, such as rain, snow, sleet, wind, solar radiation, and atmospheric contamination.