



Standard definitions of Terms Relating to SEALANTS

Abrasion resistance- resistance to wear resulting from mechanical action of surface.

Accelerated aging- a set of laboratory conditions designed to produce in a short time the results of normal aging (usual factors include temperature, light, oxygen, water, and other environments as needed).

Accelerator- an ingredient used in small amounts to speed up the action of a curing agent (sometimes used as a synonym for curing agent).

Acrylic- a group of thermoplastic polymers or resins formed from acrylic acid.

Activator- a material that speeds up normal curing mechanisms.

Adhesive failure- type of failure characterized by pulling the adhesive or sealant loose from the adherend.

Adsorption- the action of a body in condensing and holding gases and other materials at its surface.

Aging- the progressive change in the chemical and physical properties of a sealant or adhesive.

Alligatoring- cracking of a surface into segments so that it resembles the hide of an alligator.

Ambient temperature- temperature of the air surrounding the object under construction or test.

Asphalt- a naturally occurring mineral pitch or bitumen.

Back-up- a compressible material used at the base of a joint opening to provide the proper shape factor in a sealant design; this material can also act as a bond breaker.

Band-aid or bandage sealant design- a sealant placed above an opening designed to accommodate greater movement.

Batten plate- a thin metal plate separated by sealant beads to bridge poorly designed joints.

Bead- a sealant or compound after application in a joint irrespective of the method of application, such as caulking bead, glazing bead, and so on.

Bedding compounds- any materials into which another material, such as a plate of glass or a panel may be embedded for close fit.

Birefringence- the refraction of light in two slightly different directions to form two rays; the phenomenon can be used to locate stress in a transparent material.

Bond breaker- thin layer of material such as tape used to prevent the sealant from bonding to the bottom of a joint.

Bond durability- test cycle, in ASTM C-920 for measuring the bond strength after repeated weather and extension cycling.

Bulk compounds- any sealant or caulk that has no defined shape and is stored in a container.

Butt joint- a joint in which the structural units are jointed to place the sealant into tension or compression.

Carbon black- finely divided carbon used as a reinforcing filler in sealants.

Cap bead- a bead placed above a gasket in a glazing design.

Catalyst- substance used in small quantities to promote a reaction, while remaining unchanged itself; sometimes referred to as the curing agent for sealants.

Caulk, n- an old term used to describe materials used in joints. Generally applied to oil based compounds, but later applied to materials with low movement capability. The word is also used as a substitute for sealant. ASTM C-24 has adopted the position that all caulks are sealants.

Caulk, v – to fill joints with a material.

Chain stopper- a material added during the polymerization process to terminate or control the degree of the reaction. This could result in soft sealants, or higher elongation.

Chalking- formation of slight breaks or cracks in the surface of a sealant

Chemical cure- curing by a chemical reaction. Usually involves the crosslinking of a polymer.

Closed-cell foam- a foam that will not absorb water because all the cells have complete walls.

Cohesion- the molecular attraction that holds the body of a sealant or adhesive together. The internal strength of an adhesive or sealant.

Cohesive failure- the failure characterized by pulling the body of a sealant or adhesive apart.

Compatible- the ability of two or more substances to be mixed or blended together without separating, reacting, or affecting the material adversely. However, two materials such as a sealant and a tape gasket are compatible if there is no interaction between them, and materials from one do not migrate into the other.

Compression seal- a preformed seal that is installed by being compressed and inserted into the joint.

Cone penetrometer- an instrument for measuring the relative hardness of soft deformable materials.

Crazing- a series of fine cracks that may extend through the body of a layer of sealant or adhesive.

Creep- the deformation of a body with time under constant load.

Crosslinked- molecules that re joined side by side as well as end to end.

Cure- to set or harden by means of a chemical reaction

Cure time- time required to effect a cure at a given temperature.

Drying agent- a component of paint or a sealant that accelerates the oxidation of oils or unsaturated polymers.

Depolymerization- separation of a complex molecule into simple molecules; also softening of a sealant by the same action.

Durometer- an instrument used to measure hardness or Shore A hardness; may also refer to the hardness rather than the instrument.

Elasticity- the ability of a material to return to its original shape after removal of a load.

Elastomer- a rubbery material that returns to approximately its original dimensions in a short time after a relatively large amount of deformation.

Epoxy- a resin formed by combining epichlorohydrin and bisphenols. Requires a curing agent for conversion to a plastic like solid. Has outstanding adhesion and excellent chemical resistance.

Exothermic- a chemical reaction that gives off heat.

Extender- an organic material used as a substitute for part of the polymer in a sealant or adhesive.

Extensibility- the ability of a sealant to stretch under tensile load.

Extrusion failure- failure that occurs when a sealant is forced too far out of a joint by compression forces. The sealant may be abraded by dirt or folded over by traffic.

Face clearance- the distance between a glass plate and the edge of the stop.

Fatigue failure- failure of a material as a result of rapid cyclic deformation.

Filler- finely ground material added to a sealant or adhesive that either improves certain properties or, if used in excess, cheapens the compound.

Flashing- strips, usually of sheet metal, rubber, or plastic, used to waterproof the junctions of building surfaces, such as roof peaks and valleys, or around windows.

Gasket- a cured elastic but deformable material placed between two surfaces to seal the union.

Gunability- the ability of a sealant to extrude out of a cartridge in a caulking gun.

Gypsum wallboard- a sandwich type material. Gypsum plaster with a heavy paper coating on both sides. When fastened directly to studs, it forms a wall surface.

Hardboard- fine pieces of wood bound together with an adhesive and pressed into sheets. Thermosetting resins are used as the adhesive binder.

Hardener- a substance added to control the reaction of a curing agent in a sealant or adhesive. Sometimes used as a synonym for curing agent or catalyst.

Hardness- the resistance of a material to indentation measured on an instrument such as a Durometer. The value is an artificial number. On a Shore A Durometer scale, numbers range from 0 to 100 for rubber like materials.

Head- the top member of a window or door frame.

Heel bead- sealant applied at the base of a channel. This sealant bridges the gap between the glass and the frame.

Hochman test cycle- the bond durability test cycle used in ASTM C 920.

Hypalon- a chlorosulfonated polyethylene synthetic polymer that is a base for making solvent based sealants.

Joint- the point at which two substrates are joined, or the opening between component parts of a structure.

Laitance- a thin, weak coating that sometimes forms on the surface of concrete caused by water migration to the surface.

Lap joint- a joint in which the component parts overlap so that the sealant or adhesive is placed into shear action.

Latex- a colloidal dispersion of a rubber (synthetic or natural) in water, which is the base for a sealant.

Latex caulks or sealants- a caulking compound or sealant using latex as the base raw material. The most common latex caulks are polyvinyl acetate and vinyl acrylic.

Load transfer device- any device embedded in the concrete on both sides of a pavement joint to prevent relative vertical movement of slab edges.

Mastic- a thick pasty coating or sealant.

Mercaptan- an organic compound containing –SH groups; a main curing agent for polysulfide adhesives and sealants.

Modulus- the ratio of stress to strain. Also the tensile strength at a given elongation.

Monomer- a material composed of single type of molecule. A building block in the manufacture of polymers.

Mullion- external structural member in a curtain wall building, usually vertical. May be placed between two opaque panels, between two window frames, or between a panel and a window frame.

MVT- moisture vapor transmission, usually expressed in terms of grams of water per square meter per 24 hours.

Neck down- the change in the cross section areas of a sealant as it is extended.

Needle glazing- the application of a small bead of sealant using a nozzle not exceeding ¼ inch in diameter.

Oil (drying)- an oil that dries to a hard, vanish like film. Linseed oil is common example.

Open cell foam- a foam that will absorb water and air because the walls are not complete and run together.

Open time- time interval from when an adhesive is applied to when it becomes unworkable.

Particle board- same as hardboard, except that larger wood chips are used as the filler.

Pavement growth-an increase in the length of a pavement caused by incompressibles working into the joints.

Parapet- extended upward portion of a wall above the roof line.

Peel test- a test of an adhesive or sealant using one rigid and one flexible substrate. The flexible material is folded back (usually 180 degrees) and the substrates are peeled apart. Strength is usually measured in pounds per inch of width.

Permanent set- the amount of deformation that remains in a sealant or adhesive after removal of a load.

Phenolic resin- a thermosetting resin; usually formed by the reaction of phenol with formaldehyde.

Pitch- the residue that remains after the distillation of oil and other substances from raw petroleum.

Plasticizer- a material that softens a sealant or adhesive by solvent action, but is relatively permanent.

Plastisol- a physical mixture of resin (usually vinyl) compatible plasticizers and pigments. Mixture requires fusion at elevated temperatures in order to convert the plastisol to a homogeneous plastic material.

Poise- the cgs unit viscosity.

Polyester- resins manufactured by reaction of a dicarboxylic acid and a dihydroxy alcohol. They may be used in one part and two part systems for coatings and molding compounds.

Polyethylene- a straight chain polymer of ethylene.

Polymer- a compound consisting of long chain-like molecules.

Pot life- the same as working life.

Preformed sealant-a sealant that is preshaped by the manufacturer before being shipped to the job site.

Reflection crack- a crack through a bituminous overlay on Portland cement concrete pavement. The crack occurs above any working joint in the base pavement.

Reinforcement- in rubber or sealants, this is the increase in modulus, toughness, tensile strength, and so forth, by the addition of selected fillers.

Resilience- a measure of energy stored and recovered during a loading cycle. It is expressed in a percentage.

Retarder- a substance added to slow down the cure rate of a sealant.

Routing- removing old sealant from a joint by means of a rotating bit or saw blade.

Seal- ASTM definition is “a material applied to a joint or on a surface to prevent the passage of liquids, solids, or gases.”

Sealant- ASTM definition is “in building construction, a material which has the adhesive and cohesive properties to form a seal.” Sometimes defined as an elastomeric material with movement capability greater than 10%, but this definition has been expanded to include all sealants covered by ASTM Committee C-24.

Sealer- surface coating generally applied to fill cracks, pores, or voids in a surface.

Sealing tape- ASTM definition is “a preformed, uncured, or partially cured material which when placed in a joint, has the necessary adhesive and cohesive properties to form a seal”.

Self-leveling sealant- a sealant that is fluid enough to be poured into horizontal joints. It forms a smooth, level surface without tooling.

Shape factor- the width-to-depth proportions of a field molded sealant.

Shear test- properties.

Shore A hardness- the measurement of firmness of a rubbery compound or sealant by means of a Durometer hardness gauge.

Silane- any monomeric tetrafunctional derivative of silicone, such as vinyl trichlorosilane.

Skewed joints- transverse joints in a pavement slab, which are placed at an angle and not perpendicular to the direction of traffic.

Spalling- a surface failure of concrete, usually occurring at the joint. It may be caused by incompressibles in the joint, by overworking the concrete, or by sawing joints too soon.

Stopless glazing- the use of a sealant as a glass adhesive to keep glass in permanent position without the use of exterior stops.

Strain- deformation per unit length. The change in length divided by the original length of a test specimen and expressed as a percentage.

Stress- force per unit area, usually expressed in pounds per square inch.

Stress relaxation- reduction in stress in a material that is held in constant deformation for an extended period of time.

Structural glazing gaskets- a synthetic rubber section designed to engage the edge of glass or other sheet material in a surrounding frame by forcing an interlocking filler strip into a grooved recess in the face of the gasket.

Substrate- an adherend; the surface to which a sealant or adhesive is bonded.

Tackiness- the stickiness of the surface of a sealant or adhesive.

Tear strength- the load required to tear apart a sealant specimen. ASTM test method D 624 expresses tear strength in pounds per inch of width.

Tensile strength- resistance of a material to a tensile force and expressed in psi.

Thermoplastic- a material that can be repeatedly softened by heating.

Thermosetting- a material that hardens by chemical reaction that may be activated by heat or that may give off heat if the reaction is rapid.

Thixotropic (nonsagging)- a material that maintains shape unless agitated. A thixotropic sealant can be placed in a joint in a vertical wall and will maintain its shape or position without sagging during the curing process.

Tooling- the act of compacting and shaping a material in a joint, which may also assist in expelling any entrapped air.

Transverse joint- a joint perpendicular to the direction of traffic in a highway pavement.

Ultraviolet light (UV)- part of the light spectrum which can cause chemical changes in sealant materials.

Viscosity- a measure of the flow properties of a liquid or paste, usually expressed in poises.

Vulcanization- improving the elastic properties of a sealant or rubber by chemical change, usually by heat.

Working life- period of time after mixing during which a sealant or adhesive can be used; it may be expressed in minutes or hours.

The following sources were used in compiling this Appendix:

- ASTM D 907, "Standard Definitions of Terms Relating to Adhesives," American Society for Testing and Materials, Conshohocken, PA.
- ASTM C717, "Terminology of Building Seals and Sealants," American Society for Testing and Materials, Conshohocken, PA.
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