PRC® and Pro-Seal®
aerospace sealants glossary

PRC-DeSoto
International

1. **Abrade** - To prepare a surface by roughening it through sanding or other means.
2. **Accelerator** - This term is used by sealant formulators for a compound that hastens a reaction, especially one that reduces the curing or hardening time of compounds. For PRC® and Pro-Seal® brand sealants the Part A component is the Accelerator.
3. **Accelerated Cure** - An abbreviated cure cycle where the sealant is cured at elevated temperatures as defined by the procuring specification. Generally used for specification acceptance testing.
4. **Adhesion -** The chemical and mechanical bonding of a material to a surface.
5. **Adhesion Promoter** - A material applied to a surface to chemically enhance the adhesion of a sealant to the surface. The term Coupling Agent is often used as a synonym.
6. **Adhesive** - Substance capable of holding materials together by surface attachment. This is a general term that includes cement, glue, mucilage, paste, etc.
7. **Adhesion Failure** - (1) The separation of two surfaces with a force less than specified. (2) The separation of two adjoining surfaces.
8. **Aliphatic** - Organic compounds (hydrocarbons) in which carbon atoms are arranged in an open or straight chain more commonly called naphthas.
9. **Air Curing** - Thermosetting at ordinary room temperature without the aid of heat.
10. **Application Properties** - Attributes of the uncured sealant that affect how it is applied, such as viscosity, worklife, and cure rate.
11. **Application Time** - The length of time after mixing, or the end of thaw for Pre-Mixed Frozen (PMF), that sealant remains suitable for application to the substrate. Since temperature and humidity can greatly affect this, stated application time is generally established at 77ºF and 50% RH. Major U.S. Specifications will define the end of application time for Class B (extrusion grade) and Class C (roller grade) sealants by establishing a minimum extrusion rate at 90 PSI through a 1/8 inch orifice (Semco® model 440 nozzle). For Class A (brush grade) the time for the material to increase to some maximum viscosity (usually 2500 Poise) is used.
12. **Assembly Time** - The maximum length of time after mix or thaw (PMF), that the sealant remains suitable to assemble parts, including final tightening of fasteners, to assure proper sealing. The term is used interchangeably with Squeeze-Out Life. The stated assembly time will be longer than the sealant's application time, and is determined at standard temperature and humidity as defined by the procuring specification. Apparent or actual assembly time will vary with ambient conditions.
13. **Base Compound** - The major component of a two-part curing-type sealant containing the polymer (Part B).
14. **Block Flow** - A lab device used to measure the vertical slump or sag of a sealant. See Flow Test.
15. **Brush Coat** - The thin coating of sealant usually applied over fasteners, seams, and various parts and small openings. Some aircraft manufacturers require this type of application prior to the application of the primary fillet (class B) sealant.
16. **Brush Grade Sealant** - A thin viscosity (150-500 Poise) sealant designed for brush application. Most U.S. specifications designate this grade as Class A.
17. **Catalyst** - The component of a two-part curing type sealant that causes the polymer to polymerize.
18. **Centipoise** - 1/100 of a poise which is a value for viscosity. The viscosity of water at 20ºC is approximately 1 centipoise.
19. **Channel Seal** - A post assembly seal formed by injecting a noncuring sealant material into a groove machined in one faying surface of the mating or overlapping structure.
20. **Chalking** - Formation of a powdery surface condition due to the break down of a surface binder or elastomer due to weathering or other destructive environments.
21. **Checking** - Fine cracks in films resulting from excessive shrinkage of the film or expansion of the surface coupled with insufficient elasticity.
22. **Clamp-up Time** - See Assembly Time.
23. **Class A Sealants** - See Brush Grade Sealants.
24. **Class B Sealants** - See Extrusion Grade Sealants.
25. **Class C Sealants** - See Roller Grade Sealants.

26. **Coating** - A material, usually liquid, used to form a covering film over a surface. Its function is to decorate and/or protect the surface from destructive agents or environments (abrasion, chemical action, solvents, corrosion, weathering).
27. **Coefficient of Expansion** - The thermal expansivity. The fractional change in dimension for a unit change in dimension
28. **Cohesion/Cohesive Strength -** The internal forces holding a sealant together, usually by primary or secondary valence forces. The internal strength of a film. For sealant performance testing, adhesion results are often expressed in percent cohesion. This means that the force required to tear the sealant, making it fail within itself, is less than its adhesive strength to the substrate it has been applied to.
29. **Compound** - A distinct substance formed by the union of two or more elements in definite proportions by weight - as water is a compound of hydrogen and oxygen. Also loosely used in the rubber and plastics Industry to denote a mix of fillers and binders.
30. **Contaminant** - Any solid or liquid substance that can interfere with the function of the sealant, coating, adhesion promoter, etc.
31. **Corrosion Coating** - A material applied to integral tanks to coat the surface and supply protection to the metal, preventing chemical deterioration or corrosion.
32. **Crazing** - Fine cracks which may extend in a network over or under the surface of or through a plastic or rubber like compound.
33. **Cure Rate** - The length of time required for a sealant to obtain minimum hardness as determined by the procuring specification. Polysulfide fuel tank sealants are considered cured when they reach a Durometer hardness of 35 A (depending upon the specification). Their ultimate hardness may be greater.
34. **Degassing** - The removal of air and gasses by means of vacuum from a mixed compound.
35. **Density** - Mass per unit volume.
36. **Durometer A Hardness** - A measurement of hardness using a Shore A or a Rex hardness gauge. The gauge has a dial, a foot, and a pin that protrudes slightly through a hole in the face of the foot. The foot is pressed against a sealant specimen that is at least 1/4 inch (6.4 mm) thick. After 3 to 5 seconds, a numerical reading is taken from the dial. (Sealant example: Cured polysulfide sealants usually show a hardness in the 30 to 60 range). See ASTM Method D 2240.
37. **Elongation** - The increase in length of a section under going testing expressed as a percentage difference between the original length and the length at the moment of break.
38. **Extrusion Grade Sealant** - Higher viscosity sealants (8,000-16,000 Poise), designed for application by extrusion via a pnuematic Semco® gun. This grade usually is used for forming fillets and sealing on vertical surfaces where low slump/sag is required. Most specifications will designate these as Class B Sealants.
39. **Fairing** - A shape that produces a smooth transition from one angular direction to another; or the act of producing this smooth contour. Its purpose in tooling sealants is to ensure good contact with the surfaces and to minimize air entrapment.
40. **Fay Surface Sealants** - Generally roller grade sealants with long application (12-96 hours), and assembly times (20-360 hours) used for fay surface sealing.
41. **Faying Surface Seal** - A preassembled seal installed between two mating (overlapping) surfaces. Faying surface sealants are used to prevent corrosion, and, in conjunction with fillet seals, to prevent a leak path from extending through a faying surface to another area. When modified by a groove, a faying surface seal has been used as a primary seal.
42. **Feathering** - This term is interchangeable with Fairing.
43. **Flow** - See Block Flow.
44. **Fillet Seal** - A primary seal (post assembly) applied at the juncture of two adjoining parts or surfaces and along the edges of faying surfaces as a continuous bead of sealing material. It can be applied over, along the edges of, and between installed parts.

45. **Flow Test** - The distance a sealant will sag on a vertical surface in a given period of time. A two-part sealant is thoroughly mixed at 77ºF (25ºC) and 50% RH and placed in a cylindrical recess in a vertical metal fixture scribed with horizontal lines to mark tenths of inches (one-part sealants are also tested this way). The lines start immediately below the circular hole in the face of the metal block. Timing starts when the plunger in the recess is pushed, causing the short cylindrical sealant specimen to hang from the vertical face of the metal block. The distance the sealant sags in a given period of time (usually 30 minutes) is a measure of its flow. Some test procedures require that the sealant be removed after a given period of time, stirred, and reapplied. This is done to measure the ability of the sealant to reestablish its gel formation.
46. **Hardness** - For sealants, this term is interchangeable with Durometer A Hardness.
47. **Hygroscopic** - Absorbtion of water from the air.
48. **Interface** - The common boundary surface between two substances. Sometime described as two surfaces with no space between them.
49. **Integral Fuel Tank** - A load-carrying structure of an aircraft absolutely sealed to provide for fuel containment. It exists as a cavity in a wing or in the fuselage or both.
50. **Interface Seal** - A seal produced between a fastener and its hole when a fastener of a given diameter is driven into a hole of smaller diameter (the hole diameter is approximately 0.003 inches (0.08 mm) smaller than the fastener). An interface seal is also produced when a fastener shank is expanded by the installation process.
51. **Modulus** - The stress in PSI required to obtain the stated elongation.
52. **Moisture Absorption** - The percentage by weight of water absorbed by a sample, immersed in water. The rate of absorption depends on the relationship of weight and area.
53. **Moisture Vapor Transmission** - The weight of water vapor which will pass through a film of standard area and thickness in a unit of time. Expressed in milligrams per day per square cm of 1 millimeter thickness and in other units.
54. **Peel** - A method of separating a bond of two flexible materials, or a flexible and a rigid material, whereby the flexible material is pulled from the mating surface at a 90º or 180º angle to the plane onto which it is adhered. The stress is concentrated only along the line of immediate separation. Strengths are expressed in pounds per linear inch (pli) or inch width (piw).
55. **Pot Life** - The rating in hours of the time interval following the addition of accelerator before a chemically curing material will become too viscous to pass predetermined viscosity (consistency) requirements. Closely related to Application Life.
56. **Rex Hardness** - This term is interchangeable with Durometer A Hardness.
57. **Roller Grade Sealant** - Sealant designed for application by a roller or combed tooth spreader. Its base viscosity is usually 1000-4000 Poise. This grade is most often specified for fay surface sealing. Often referred to as Class C, or Fay Surface sealants.
58. **Sag** - The “droop” of a sealant after it is applied to an overhead or vertical surface. (See also Flow).
59. **Seal** - The closure of a fuel tank or vessel to make it leak proof by the applying sealant to fasteners, seams, and any other possible leak paths. Seals may also be created by compressive interference (such as O-rings, plugs, elastomeric seals, and interference fit fasteners).
60. **Sealant** - A continuous film to prevent the passage of liquids or gaseous media; a high-bodied material generally of low cohesive strength to fill voids of various sizes to prevent the passage of liquid or gaseous media.
61. **Semkit® Package** - A PRC-DeSoto International product name to describe a ready to use, disposable plastic cartridge-based system. Designed to facilitate the storage, mixing, and dispensing of multiple component materials in premeasured volumetric ratios. There are two styles: The Barrier style, which holds proportioned amounts of two components separated by an aluminum barrier; and the Injection style, which stores the catalyst material within the injection rod to separate it from the base compound prior to use.

62. **Set-up** - To harden, as in polymerization or curing.
63. **Shelf Life, Storage Life** - The length of time any unused sealant can be stored at the supplier recommended storage temperature and still retain the properties in both the unmixed and mixed states required by the specification or advertised in the product data sheet.
64. **Shore A Hardness** - See Durometer Hardness.
65. **Slump** - This term is interchangeable with Flow.
66. **Sponging** - A phenomenon in sealants that is sometimes observed after fuel soak and temperature cycling. The sealant swells and a cross-section reveals many voids of various sizes. Sponging can also be caused by other factors but the occurrence is rare.
67. **Squeeze-Out** - The term used for the visible sealant that is forced out at the outer edges of a faying surface sealed structure when it is assembled. If no sealant squeeze-out is observed, this indicates that either the sealant was cured at the time of assembly, or insufficient sealant was applied. Both conditions would cause seal failure.
68. **Squeeze-Out Life** - This term is interchangeable with Assembly Time.
69. **Surface Preparation** - The procedure required with respect to a foundation surface or the materials to be adhered which will promote optimum performance of a sealant, coating, or adhesive.
70. **Tack-Free Time** - The length of time required for a curing sealant to lose its surface tackiness. This is determined by placing a small polyethylene film on its surface, then peeling it away. The surface is tack free when no sealant is carried with it.
71. **Tear Strength** - The force required to start or continue a tear in a material under specified conditions. Measured in pounds per inch.
72. **Tensile Strength** - The pulling force in pounds necessary to break a given sample, divided by the area of the cross section in square inches.
73. **Thermal Conductivity** - The time rate of heat transfer by conduction through unit thickness across unit area for unit difference of temperature.
74. **Thermal Expansion** - The coefficient of expansion; the increase in length per unit length per degree centigrade rise in temperature.
75. **Thixotropy** - The property of a nonsag material that permits it to be moved (stirred or extruded) with less force than would be required with a Newtonian fluid. (Non-Newtonian pseudoplastic materials, such as the nonsag sealants, stand like whipped cream without seeking their own level, but flow easily from a sealant gun under relatively low pressure.)
76. **Topcoat** - A material applied as a thin coating over the surface of applied sealant to protect it from the possible deleterious effects of fuel.
77. **Viscosity** - A manifestation of internal friction; opposed to mobility. The property of fluids whereby they resist an instantaneous change of shape (i.e., resistance to flow).
78. **Void Seal** - A seal used to fill holes, joggles, channels, and often other voids caused by the build-up of structure in a fuel tank. The void seal provides continuity of sealing where fillet seals are interrupted by structure gaps.
79. **Wet Installed Fastener** - Fasteners that have sealant applied to their shank, and under their head prior to installing to provide a corrosion barrier and secondary seal.
80. **Work Life** - This term is interchangeable with Assembly Time. MIL-S-8802 refers to assembly time or open time of faying-surface sealants, (i.e., the amount of time the surfaces can be left open and still squeeze out the sealant on closure to a thickness of 0.005 inches (0.13 mm) or less).

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