

DeSoto[®]
aerospace coatings glossary

Coating Defects

- 1. Bleeding** - A defect in which pigment from a lower coat of paint diffuses into an upper coat and discolors the latter.
- 2. Bloom** - The appearance of a hazy deposit of oil or waxlike material on a coated surface that mars the surface appearance by lowering the gloss or giving a mottled or nonuniform appearance. This is caused by the migration to the surface of an oil, plasticizer, or noncrosslinked coating constituent when the coated part is exposed to a cycle of heat, humidity, and cooling.
- 3. Blushing** - A whitening of the surface of a coating which occurs when the coating is applied under conditions of high relative humidity. Usually caused by a combination of high relative humidity and fast evaporating solvents.
- 4. Bumps** - High and low spots in a coating surface caused by unwanted flowing that occurs during curing. Caused by surface tension gradients that arise during curing.
- 5. Chalking** - Formation of a powdery surface condition due to the disintegration of the surface binder or elastomer due to weathering, fuel, or other destructive environmental factors.
- 6. Cracking** - The formation of surface cracks, often as a fine network, that change the properties of the film. Cracking often does not penetrate to the underlying surface.
- 7. Cratering** - The formation of small bowl-shaped depressions in a coating film. These depressions frequently have drops or bands of material at their centers and raised circular edges. Some common causes of cratering are: gel particles, oil droplets from air lines, and substrate contamination.
- 8. Crawling and Dewetting** - The tendency of a wet paint film to recede from certain areas of a painted surface. A frequent cause of dewetting is a dirty substrate that may result from poor wetting, contamination, fingerprints, or cutting oils.
- 9. Fat Edges and Picture framing** - The appearance of fat edges or picture framing around the edges of a panel or metal part.
- 10. Fish-Eyes** - Craters distinguished by a center which consists of a uniform flat painted region, surrounded by a depression, followed by a ridge of paint. Fish-eyes are caused by undispersed fluid globules in the paint or by air-borne droplets that are deposited on the painted surface.
- 11. Flooding** - A uniform color change occurring in a wet paint film after application. A separation occurring as a result of different rates of pigment settling caused by a difference in pigment density and size or flocculation of one of the pigments.
- 12. Floating** - A term used to describe a mottled, blotchy, or streaked appearance in a paint film. This is due to the separation and uneven distribution of the different pigments in the paint.
- 13. Haze** - A general term applied to virtually any dulling of a paint surface. It is used to cover a wide variety of defects. Haze may be due to material that has exuded to the surface, fine solvent popping, roughening of the surface because of flocculation or poor coalescence, microvoids, etc.
- 14. Kick-out** - The precipitation of a dissolved binder from a solution as a result of solvent incompatibility. Can be caused by improper mixing or adding the flow control component too quickly to the mixed system.
- 15. Mottle** - A term often used interchangeably with flooding or floating.
- 16. Orange Peel** - A surface bumpiness or waviness that resembles the skin of an orange. Orange peel is often caused by poor leveling and is a common defect in both spray and roll applied coatings.
- 17. Seeds** - Small granule-like defects which occur randomly over a coating surface marring the appearance. Seeds can result from undispersed or flocculated pigment, dirt, resin gel particles, precipitated resin, and pigment due to solvent shock.
- 18. Sagging, Running, Curtaining** - The unsightly gravity driven flow that usually occurs on vertical surfaces. This is due to too much flow, often related to application technique or environment.
- 19. Silking** - This is defined as fine parallel irregularities in a paint film that give the appearance of silk. This defect usually is a special case of floating and flocculation in coating finishes.
- 20. Skinning** - The formation of a thin, tough film on the surface of a liquid paint. Commonly caused by a chemical reaction to moisture in the air.

- 21. Solvent Popping** - The formation of defects by the violent evolution of trapped solvent or carbon dioxide that occurs after the coating has begun to gel during its curing cycle. Commonly caused by a combination of the following: high film builds, high temperature and relative humidity, high airflow, quick curing, slow evaporating solvents, and certain types of spray equipment.
- 22. Telegraphing** - The revealing of the substrate surface profile through the coating after cure. Commonly caused by not using a surfacer or filler.
- 23. Water Spotting** - The change in surface appearance resulting from the action of water standing on the paint film or substrate. Spotting usually is caused by water sensitivity of the coating, although the defect can be the result of dissolved material deposited as water evaporates.
- 24. Wrinkling** - A defect in which the film surface skins over and then absorbs liquid within the film.

Application Terms

- 1. Airless Spray** - A system of applying paint in which the paint, under high pressure, is passed through a nozzle and is broken into droplets (atomized) when the paint enters the lower pressure atmosphere.
- 2. Air-Assisted Airless** - An airless system that uses small amounts of air to help atomize the paint in conjunction with airless spray. Used to get rid of the nagging problem of "Rabbit Ears".
- 3. Air spray** - A system of applying paint in the form of tiny droplets in the air. The paint is broken down into droplets (atomized) by a spray gun as a result of being forced into a high velocity air stream.
- 4. Atomization** - The formation of tiny droplets of liquid as in the paint spraying process. Atomization is usually caused by turbulence in an air stream, or a sudden drop in pressure.
- 5. Cure** - The process by which a coating is converted from the liquid to the solid state. Enamels cure. Lacquers do not cure.
- 6. Downdraft Booth** - A spray booth in which the air movement is from the ceiling through the floor.
- 7. Electrostatic Spraying** - A system of applying a coating in which the coating droplets from an air, air-assisted airless, or airless spray gun are given an electrical surface charge. These electrical charged droplets are attracted to an electrically grounded workpiece.
- 8. Flat** - A surface with minimal reflection, commonly fewer than seven units of gloss when measured at a 60° angle. "Gunship Quality" is when the coating has no more than three units of gloss when measured at an 85° angle. Flat is the opposite of gloss.
- 9. Flowcoating** - A system of applying paint where the paint is allowed to flow over and drain off the workpiece.
- 10. Gloss** - The degree to which a surface reflects light. Commonly measured at a 60° angle.
- 11. Matte** - A surface with minimal reflection. Matte is the opposite of gloss. See Flat.
- 12. Overspray** - Sprayed paint that misses the area being painted and falls upon the surrounding surface. Can cause gloss loss with gloss paints or mottling with flats paints.
- 13. Powder Coating** - A coating that is applied to the surface as a dry, finely ground powder and then heated above its melting point so the powder particles flow together or cure.
- 14. Rabbit Ears** - A Spray pattern often seen with airless spray. The edge of the pattern separates to form a single stream.
- 15. Retarders** - A solvent added to a paint to slow down its evaporation rate.
- 16. Sidedraft booth** - A spray booth in which the air movement is from the front to the back of the booth.
- 17. Time between coats** - A time range given to apply a second coat of topcoat without any film defects.

- 18. Wet edge** - The ability of a wet coating to blend smoothly together in the overlap areas during application.
- 19. Wet sand** - A technique involving the sanding of a surface while it is being flushed with water.
- 20. Wrap around** - The phenomenon by which electrically charged paint droplets curve around the rear side of the object being painted.

Chemistry and Coating Terms

- 1. Aliphatic** - Organic compounds (hydrocarbon) in which carbon atoms are arranged in an open or straight chain more commonly called naphtha.
- 2. Alodine** - See Etching.
- 3. Adhesion** - A chemical or mechanical bonding of a material to a surface.
- 4. Aromatics** - A type of solvent based on Benzene ring molecules (e.g. Benzene, Xylene, Toluol).
- 5. Catalyst** - A chemical used to change the rate of a chemical reaction. Differs from a curing agent in that the catalyst is not itself chemically consumed in the reaction while a curing agent is.
- 6. Compatibility** - The ability of two or more substances to mix with each other in a wet or dry state to form a homogeneous composition.
- 7. Corrosion** - The oxidative decomposition of a metal in contact with its environment.
- 8. Density** - An expression of the mass of a substance per a given volume. The lower the density of the paint, the less weight added to the painted aircraft.
- 9. Diluent** - A liquid which increases the capacity of a solvent for the binder. Diluents cannot dissolve the binder themselves. They are usually used to control viscosity or flash off time.
- 10. Dry to Tape** - The drying time required to allow a coating the ability to resist marring of adhesive tape, after wiping the panel clean.
- 11. Enamel** - A very confusing term as it has several meanings:
 - (1) A paint which forms a film by chemical union of its component molecules during curing.
 - (2) A paint having a high gloss appearance.
 - (3) In shop terminology, any paint which is not a lacquer.
- 12. Epoxy** - A type of paint or resin, adhesive, or plastic noted for high mechanical strength, good adhesion, and resistance to solvents, acids, alkali, and corrosion. It usually does not weather well. Most commonly used as the vehicle in primers.
- 13. Etching** - The use of a chemical solution or primer to prepare a surface for priming or bonding by removing a layer of the base metal (e.g. Alodine).
- 14. Exempt Solvents** - Solvents whose use is not subject to air pollution legislation.
- 15. Filler** - A paint or paste applied to fill holes or other irregularities in a surface.
- 16. Glass Transition Temperature** - The temperature at which polymer molecules are able to move freely, even in a solid state.
- 17. Hiding Power**- The ability of a paint to mask the color or pattern of a surface.
- 18. Lacquer** - Traditionally a paint that contains a synthetic resin and forms a film through solvent loss. The film remains susceptible to attack by the same or similar solvents.
- 19. Latex Paint** - A paint containing colloidal binder particles formed by emulsion polymerization. Commonly known as a water-based material.
- 20. Non-Volatile** - The portion of a material that does not evaporate at ordinary temperatures. This includes such ingredients as pigments, drying salts, resins, oils, amines, etc. Also see Percent Solids.
- 21. Paint** - A material which, when applied as a liquid to a surface, forms a solid film for the purpose of decoration and/or protection. Generally a paint contains binders (resins), solvents, pigments, and additives.
- 22. Polyurethane** - A type of paint or resin known for its toughness, flexibility, weather resistance, chemical resistance, and abrasion resistance. The resin or vehicle commonly used to make topcoats.

- 23. Percent Solids** - The percentage mass of non-liquid components in paint.
- 24. Pot Life** - The useable or sprayable life of a coating after mixing has occurred. As mixed material reacts in the pot, the viscosity always increases.
- 25. Primer** - A type of paint applied to a surface to improve adhesion, corrosion resistance of the substrate, or to increase compatibility with the topcoat.
- 26. Rub-up** - Refers to the color change which results from rubbing a portion of the applied coating.
- 27. Shelf Life** - The length of time any unopened container can be stored at the supplier recommended storage temperature and still retain the properties in both the unmixed and mixed states as required by the specification or advertised in the product data sheets.
- 28. Surfacer** - An easy sanding paint used to fill surface irregularities.
- 29. Thixotropy** - The tendency for the viscosity of a liquid to be shear rate dependent. When the liquid is rapidly shaken, brushed, or otherwise mechanically disturbed, the viscosity decreases rapidly.
- 30. Topcoat** - Usually the final paint film applied to a surface.
- 31. UV Stabilizers** - Chemicals added to paint to absorb the ultraviolet radiation present in sunlight.
- 32. Varnish (Clearcoat)** - An unpigmented binder-solvent solution applied to protect or decorate a surface.
- 33. Viscosity** - The property of liquid which enables it to resist flow.
- 34. V.O.C.** - Volatile Organic Compound or liquid that is non-exempt.
- 35. Volatile** - Amount of solvent or liquid components in a coating.

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