

# TYPES OF PAINTS

## OIL PAINT

Contains pigments usually suspended in linseed oil, a drier, and mineral spirits or other type of thinner. The linseed oil serves as the binder for the pigments, the drier controls drying time, the thinner controls the flowing qualities of the paint. As the thinner evaporates, the mixture of pigments and oil gradually dries to an elastic skin as the oil absorbs oxygen from the air or "cures". The curing action bonds a tough paint film to the applied surface. Oil paints are used inside and outside and are regarded as the traditional house paint.

## VARNISH

Consists of a solution of resins in a drying oil. Varnish contains little or no pigment. It dries and hardens by evaporation of the volatile solvents, oxidation of the oil, or both.

Varnish is recommended for both outdoor and indoor applications where a hard, glossy finish that is impervious to moisture is desired. For a satin finish, the gloss varnish surface can be rubbed down with steel wool, or a "satin" varnish can be used. As a floor finish, varnish provides a hard, durable film that will not greatly alter the tone of the wood.

## ENAMEL

Enamel is a varnish with pigments added. Enamel has the same basic durability and toughness of a good varnish. It produces an easy-to-clean surface, and in the proper formulation, can be used for interior and exterior applications. For the highest quality interior work, an undercoat is required.

## LATEX PAINT

Consists of a dispersion of fine particles of synthetic resin and pigment in water. Latex paints are quick-drying, low in odor and thinned with water. They permit the repainting and decorating of a room within a day. Because latex paints set quickly, tools, equipment and spattered areas should be cleaned promptly with warm, soapy water.

No special primer is required for interior applications except over bare metal or wood, or over highly alkaline surfaces. Spot-priming with shellac should be avoided because shiny spots will bleed through the latex film.

Exterior latex house paint can be applied directly to old painted surfaces. On new wood, it should be applied over a primer. For other surfaces, follow specific label directions.

## WATER-REDUCIBLE PAINTS

This term has come into wider use in the paint business within the past few years. These products are also called "water-base" or "water-borne" paints. They include the well-known latex products, as well as products based on new synthetic polymers. While both groups employ water as the reducing agent, the chemistry of each is different.

For example, most latex coatings dry by solvent evaporation or coalescence. The new synthetic polymeric paints dry by a combination of solvent evaporation and chemical cross-linking.

Chemical cross-linking frequently requires the blending of two materials (these products are called "two-component" coatings) and a "digestion" time before the coating can be applied. The blending of specific materials results in chemical cross-linking and outstanding performance features, such as mar resistance, scratch resistance, washability and stain resistance.

## ALKYDS

Alkyd finishes are produced in four sheens: flat, semi-gloss, low-luster and high-gloss. Flat finishes have a velvety texture and are used to produce a rich, softly reflective surface. Alkyd flats can often be applied to painted walls and ceilings, metal, fully cured plaster, wallboard and woodwork without a priming. When required, the primer should be of a similar material. For high alkaline surfaces, an alkali-resistant primer should be used.

Semi-gloss or low-luster types add just enough sheen to woodwork and trim for contrast with flat-finished wall surfaces. Each offers great resistance to wear and washing. Low-luster enamels are preferred in such areas as kitchens, bathrooms, nurseries and schoolrooms.

Alkyd high-gloss enamels are often used for even greater serviceability and wash ability.

## EPOXY

A two-part formulation which is thoroughly mixed just before use. Epoxy finishes are extremely hard and durable and excellent for demanding applications. They can be used for protecting materials such as steel, aluminum and fiber glass. The paint film dries to a brilliant gloss. The tile-like finish is smooth, easy to clean and lasts for years under the most severe conditions.

## **POLYESTER-EPOXY**

Two-component materials that are usually mixed prior to application. Polyester-epoxy combines the physical toughness, adhesion and chemical resistance of an epoxy with the color retention and permanent clarity of polyester. The film is stain resistant and moisture resistant.

Polyester-epoxy is available in gloss and semi-gloss sheens, and can be applied to any firm interior surface. Pot life is a full working day.

## **ACRYLIC-EPOXY**

Two-component coatings developed by *Pittsburgh Paints* include *Pitt-Glaze Water Base Coatings*. Chemically, acrylic-epoxy coatings provide the resistance to staining, yellowing and scuffing of acrylic resins, combined with the toughness, acid and alkali resistance of epoxies. Their performance characteristics are almost equal to those of polyester-epoxy solvent based products and their stain-resistance is superior.

Acrylic-epoxy coatings are available in gloss and semi-gloss finishes - in both clear and pigmented formulations. Colorant can be added to the pigmented products to achieve hundreds of colors.

Though priced higher than conventional enamels, acrylic-epoxy coatings offer superior washability, non-yellowing characteristics, and generally 3-5 times longer life, which makes them an outstanding value for interior walls continuously subjected to hard-use conditions.

## **POLYAMIDE-EPOXY**

Tough, two-component finish with outstanding hardness, abrasion resistance, alkali and acid resistance, and adhesion when dry. Excellent as a concrete floor finish where heavy traffic wears through an alkyd finish in a short time.

For exterior applications, polyamide-epoxy will chalk and lose gloss on prolonged exposure; however, film integrity is not lost.

## **URETHANE-MODIFIED ALKYDS**

One-component finishing material for outstanding abrasion resistance on wood floors, furniture, paneling, cabinets, etc. Good resistance to normal household materials such as alcohol, water, grease, etc. It may yellow to some degree with age.

## **ACRYLIC-URETHANE COATINGS**

Recommended for areas that demand superior chemical and stain resistance, plus color and gloss retention. They are suitable for both interior and exterior application on properly primed steel, aluminum and masonry which are subjected to high acids and alkalinity.

These products are designed to be used in commercial and industrial applications but not in homes.

Acrylic-urethane coatings have high performance properties including excellent resistance to salt, steam, grease, oils, many coolants, solvents and general maintenance type machinery fluids. They also have excellent film properties and resistance to scratching, marring and chipping. The tile-like gloss and semi-gloss finishes provide superior corrosion and abrasion resistance, while maintaining excellent gloss and color retention on exterior exposures for long periods of time.

The color and gloss retention, and chemical resistance of acrylic-urethane coatings will exceed those of conventional high performance coatings. They also dry to the touch faster than any other heavy duty topcoat in the trade sales line.

## **ALUMINUM PAINT**

An all-purpose aluminum paint formulated with varnish as the vehicle for aluminum flake pigment. As the paint dries, the aluminum flakes float to the surface, providing a reflective coating. Highly resistant to weathering. Also suitable for interior use on wood, metal or masonry.

When formulated with an asphalt base, aluminum paint offers maximum adhesion and water resistance at low cost when applied to asphalt composition.

## **SHELLAC**

A long-standing favorite for finishing wood floors, trim and furniture. Shellac is thinned with alcohol and should be applied in dry, warm air to avoid clouding. It dries dust-free in 15-20 minutes.

Shellac can be used as a pre-staining wash coat to obtain an even stain tone on porous or soft wood such as pine. It can also be used to change the tone of an already shellacked surface by tinting it with alcohol-soluble aniline dye.

Instead of re-staining, pigmented shellac, also called shellac enamel, is often used as a sealant over stained finishes for a uniform, freshly painted surface.

# Glossary of Industrial Painting Terms

## - A -

### **Abrasion Resistance**

The ability of a coating to resist degradation due to mechanical wear.

### **Abrasive Media**

The material used in abrasive blasting to remove surface contaminants. Examples of abrasive media are sand, iron shot, crushed iron slag, glass beads or ground nut shells.

### **Accelerated Weathering**

A test designed to simulate but at the same time intensify and accelerate the destructive action of natural outdoor weathering.

### **Accelerator**

A substance used in small proportions to increase the speed of a chemical reaction. Accelerators are often used in the paint industry to hasten the curing of a coating system.

### **Acrylic Latex**

An aqueous dispersion of acrylic resins.

### **Acrylic Resin**

A clear resin attained by polymerizing various acrylic monomers either alone or in combination.

### **Activator**

The curing agent of a two component coating system.

### **Adhesion**

The degree of attachment between a paint film and the underlying material to which it is in contact (substrate).

### **Adsorption**

Process of attraction or attachment to a surface. The retention of foreign molecules on the surface of a substance.

### **Air Cap (Air Nozzle)**

Perforated housing for directing the atomizing air at the head of a air spray gun.

### **Air Drying**

The most common form of curing a coating in which drying takes place by oxidation or solvent evaporation by simple exposure to air without heat or catalyst.

### **Air Entrapment**

The inclusion of air bubbles in liquid paint or a paint film.

### **Airless Spray**

A spraying system in which paint is atomized using high hydraulic pressure rather than compressed air.

### **Alcohol**

A group of solvents of relatively high evaporation rate but with fairly low solvent strength. Methanol, ethanol and isopropyl are common alcohol's.

### **Aliphatic Hydrocarbons**

A class of organic solvents which are composed of open chains of carbon atoms. Aliphatics are relatively weak solvents. Mineral spirits and VM & P Naphtha are aliphatic solvents.

### **Alkali**

An aqueous liquid which has a pH value of between 7 and 14. A base or caustic material.

### **Alkyd Resin**

Resins prepared by reacting alcohol's and fatty acids. Widely used in general purpose coatings.

### **Alligatoring**

Surface imperfections of a coating film having the wrinkled appearance of alligator skin.

**Ambient Temperature**

Room temperature or the existing temperature of the surroundings.

**Amine**

Materials often used as curing agents for epoxy coatings.

**Anchor Pattern**

The surface profile generated by abrasive blasting or some power tool cleaning. The distance between peaks and valleys of the blast profile.

**Anode**

The positive terminal of an electrical source. In a corrosion cell, the anode is the electrode that has the greater tendency to go into solution of the point at which corrosion occurs.

**Aromatic Hydrocarbons**

A class of relatively strong organic solvents which contain an unsaturated ring of carbon atoms. Examples are benzene, toluene and xylene.

**Asphalt**

A black resinous material of petroleum origin.

**ASTM B 117**

Salt Fog Spray - Atomized 5% sodium chloride solution at 95 F

**ASTM D 4258 - 83**

Standard practice for surface cleaning concrete for coating.

This practice includes surface cleaning of concrete to remove grease, dirt, and loose material prior to the application of coatings. Procedures include broom cleaning, vacuum cleaning, air blast cleaning, water cleaning, detergent water cleaning, and steam cleaning.

**ASTM D 4259 - 83**

Standard practice for abrading concrete.

1. This practice includes surface preparation of concrete to prepare the surface prior to the application of coatings.
2. This practice is intended to alter the surface profile of the concrete.

**ASTM D 4260 - 83**

Standard practice for acid etching concrete.

1. This practice includes surface preparation of concrete to prepare the surface prior to the application of coatings.
2. This practice is intended to alter the surface profile of the concrete.

**ASTM D 4261 - 83**

Standard practice for surface cleaning concrete unit masonry for coating.

1. This practice covers surface cleaning of concrete unit masonry to remove dust, dirt, mortar spatter, oil, and grease prior to the application of coatings. Procedures include vacuum cleaning, air-blast cleaning, water cleaning, detergent water wash, steam cleaning, and mechanical cleaning.
2. This practice is NOT intended to alter the surface profile of the concrete masonry units but to clean the surface.

**ASTM D 4262 - 83**

Standard test method for pH of chemically cleaned or etched concrete surfaces.

1. This test method covers the procedure for determining the acidity or alkalinity of concrete surfaces prepared by chemical cleaning or etching prior to coatings.

**ASTM D 4263 - 83**

Standard test method for indication of moisture in concrete by the plastic sheet method.

1. This test method is used to indicate the presence of capillary moisture in concrete.

## **- B -**

### **Barrier Coat**

A coating used to isolate a paint system either from the surface to which it is applied or a previous coating for the purpose of increasing adhesion or insuring compatibility.

### **Binder**

The nonvolatile portion of the vehicle of a coating which holds together the pigment particles.

### **Bituminous Coating**

A coal tar or asphalt based coating material usually used in thick films.

### **Blast Cleaning**

The cleaning and roughing of a surface by the use of sand, artificial grit or fine metal shot which is projected at a surface by compressed air or mechanical means. See SSPC.

### **Blast Profile**

See anchor pattern. A cross sectional view of an abrasive blasted surface.

### **Bleaching**

The fading of a color toward white generally caused by exposure to chemicals or ultraviolet radiation.

### **Bleeding**

The diffusion of color matter through a coating from underlying surfaces causing color change.

### **Blistering**

The formation of blisters in paint films by the local loss of adhesion and lifting of the film from the underlying substrate.

### **Blooming**

A haziness which develops on paint surfaces caused by the exudation of a component of the paint film.

### **Blushing**

A film defect which manifests itself as a milky appearance which is generally caused by rapid solvent evaporation or the presence of excessive moisture during the curing process.

### **Bonding**

The attachment between a coating film and the underling material to which it is applied.

### **Bounce Back**

The rebound of atomized paint, especially when applied by conventional air spray methods.

### **Boxing**

Mixing of coatings by pouring from one container to another.

### **Bridging**

The formation of a paint film over a depression.

### **Brittleness**

The lack of resistance to cracking or breaking of a paint film when bent or flexed.

### **Brushability**

The ease of applying a coating by brush.

### **Bubbling**

A temporary or permanent film defect in which bubbles of air or solvent vapor are present in the applied film.

### **Build**

The wet or dry thickness of a coating film.

**Catalyst**

An accelerator, activator or curing agent which chemically increases the rate of reaction in a coating.

**Cathode**

The negative terminal of an electrolytic cell which, in the corrosion process, is protected and not attacked.

**Cathodic Protection**

The reduction or prevention of corrosion of a metal surface caused by making it cathodic. This is accomplished by using a sacrificial anode (such as in zinc rich coatings or galvanizing) or by using impressed current.

**Caustic**

A strong base or alkaline material.

**Caustic Soda**

A common name for sodium hydroxide, a strong base or alkali.

**Cellosolve**

Proprietary name for ethylene glycol monoethyl ether. A slow evaporating, water miscible, relatively strong solvent often used in epoxy coatings.

**Cementitious Coatings**

A coating containing Portland cement as one of its components held on the surface by a binder.

**Centipoise**

One hundredth of a poise which is a unit of measurement for viscosity. Water at room temperature has a viscosity of 1.0 Centipoise.

**Chalking**

The formation of a friable powdery coating on the surface of a paint film, generally caused by exposure to ultraviolet radiation resulting in a loss of gloss.

**Checking**

Cracks in the surface of a paint film.

**Chipping**

Small pieces of paint removed from the surface, typically a sign of physical damage incurred in shipping or handling. Use of a surface tolerant primer for touch up followed by the same finish coat generally solves the problem.

**Chlorinated Hydrocarbon**

A class of strong, fast evaporating, nonflammable solvents such as carbon tetrachloride, methylene chloride or trichloroethylene.

**Chlorinated Rubber**

A coating resin formed by the reaction of rubber with chlorine gas. Often used for chemical or water resistant properties.

**Clean and Dry**

Rather than a method, the requirement for Clean and Dry describes the condition of the surface prior to painting. The surface shall be clean, dry, and free of oil, grease, wax, form oils, and any other contaminant that may effect the adhesion of the coating. For best results and high performance requirements remove latencies and contaminants from precast and cast-in-place concrete by abrasive blasting or high pressure water blasting. Dry means that the substrate contains less than 15% moisture. Concrete should be cured at least 28 days and mortar joints at least 15 days @ 75 F and 50% RH.

See also: ASTM D 4263 - 83; ASTM D 4258 - 83; ASTM D 4259 - 83; ASTM D 4260 - 83; ASTM D 4261 - 83; ASTM D 4662 - 83

**Cleaners**

A detergent, alkali, acid or similar contamination removing material, which is usually water borne.

**Coal Tar**

A dark brown to black bituminous material produced by the destructive distillation of coal.

**Coal Tar Epoxy**

A coating in which the binder or vehicle is a combination of coal tar and epoxy resins.

**Coalescence**

The formation of resinous or polymeric material when water evaporates from an emulsion or a latex system, permitting contact and fusion of adjacent particles; fusing or flowing together of liquid particles

**Coat**

The paint applied to a surface in a single application to form a film when dry.

**Coating System**

A number of coats separately applied, in a predetermined order, at suitable intervals to allow for drying and curing, resulting in a completed job.

**Cob webbing**

Premature drying of a coating during spraying causing a spider web effect.

**Cohesion**

The forces which bind the particles of a paint film together into a continuous film. [MORE](#)

**Cold Rolled Steel**

Low carbon, cold-reduced, sheet steel. Differs from hot rolled steel by the absence of mill scale.

**Color Fast**

Nonfading.

**Color Retention**

The ability to retain its original color during weathering or chemical exposure.

**Combustible Liquid**

Any liquid having a flash point at or above 100 F (37.8 C)

**Compatibility**

The ability to mix with or adhere properly to other coatings without detriment.

**Conical Mandrel**

An instrument used to evaluate a coating's resistance to cracking when bent over a specified radius.

**Copolymer**

Large molecules obtained by simultaneous polymerization of different monomers, as in vinyl copolymers.

**Corrosion**

The decay, oxidation or deterioration of a substance (steel, concrete, and others) due to interaction with the environment. See also "Rust"

**Cracking**

Splitting of a paint film usually as a result of aging.

**Craters**

The formation of small bowl shape depressions in paint films.

**Cross Spraying**

Spraying the first pass in one direction and the second at a right angle to the first, providing more even film distribution.

**Cross linking**

The setting up of chemical links between molecular chains to form a three dimensional network of connected molecules.

**Curing Agent**

A hardener or activator added to a synthetic resin to develop the proper film forming properties.

**Curtains**

Long horizontal runs in a coating film that occur on vertical surfaces when a coating is applied too heavily.

## **- D -**

### **Degreaser**

A chemical solution or compound designed to remove grease, oils and similar contaminants.

### **Deionized Water**

Water which has been purified to remove mineral salts.

### **Delamination**

The separation between layers of coats due to very poor adhesion.

### **Density**

Mass per unit volume, usually expressed as grams per milliliter or pounds per gallon.

### **Descaling**

The removal of mill scale or rust from steel by mechanical means, sometimes assisted by flame cleaning.

### **Dew Point**

The temperature of a surface, at a given ambient temperature and relative humidity, at which condensation of moisture will occur.

### **DFT**

Dry film thickness.

### **Diluent**

A portion of the volatile components of a coating which is not a true solvent and has minimal affect on the viscosity.

### **Dispersion**

The suspension of tiny particles, usually pigments, in a liquid, usually resin.

### **Distilled Water**

Water which has been purified by vaporizing the liquid and collecting the vapor which is then condensed back to a liquid having, in the process, removed the contaminants.

### **Drier**

A chemical which promotes oxidation and subsequent drying of a paint film. Primarily used in oil base paints.

### **Dry Fall**

A coating which is designed to dry rapidly so that the overspray can be easily removed from the surfaces below.

### **Dry Spray**

Overspray or bounce back producing a sandy finish due to the sprayed particles having partially dried before reaching the surface.

### **Dry Time**

Time allotted for an applied coating film to reach a set stage of cure or hardness.

### **Dry to Handle**

The degree of cure at which a film will resist deformation due to handling.

### **Dry to Recoat**

The time required for a cured film to dry prior to the application of a second coat.

### **Dry to Tack Free**

A stage at which a coating film will form a skin to which dust will not adhere.

### **Dry to Touch**

The state of dry at which a coating film will not transfer onto an item touched lightly against it.

### **Drying Oil**

An oil having the property of hardening by oxidation to a tough film when exposed to air in the form a thin film.

### **Dulling**

A loss of gloss or sheen.

## **- E -**

### **Effervescence**

An effect in the film caused by rapid solvent release. This "boiling" of solvent causes a pinholed or cratered appearance reducing gloss.

### **Efflorescence**

Water soluble salts, deposited as moisture evaporates, on the exterior of brick or concrete.

### **Elastic**

The ability of a substance to return to its original shape or volume after a distorting force on the substance has been removed.

### **Elcometer**

A trademark and brand name for a magnetic instrument for measuring dry film thickness of coatings applied to ferrous surfaces such as steel.

### **Electrical Potential**

A minute voltage produced by the separation of molecules into their ionic state.

### **Electrolyte**

A substance that dissociates into ions in solution thereby becoming electrically conductive.

### **Electromotive Series**

A listing of elements arranged according to their standard electrical potentials otherwise known as galvanic series.

### **Electrostatic Spray**

The spray application of paint where the particles are charged causing them to be electrically attracted to the grounded surface.

### **Emulsion**

A two phase liquid system in which small droplets of one liquid are immiscible in and are dispersed uniformly throughout a second continuous liquid phase.

### **Enamel**

A term used to characterize a coating which has a glossy smooth finish. A common term for alkyd coatings.

### **Epoxy**

A synthetic resin, derived from petroleum products, that can be cured by a catalyst or used to upgrade other synthetic resins to form a harder, more chemical resistant film.

### **Ester**

Compounds formed by the reaction of alcohols and organic acids.

### **Etching**

The treatment of a surface with an acid in order to dissolve loose particles or provide a profile.

### **External Atomization**

Using air to break up a coating material after it has exited the spray gun nozzle.

## **- F -**

### **Fading**

Loss of gloss or sheen.

### **Fan Pattern**

The geometry of a spray pattern.

### **Feather Edge**

Reduced film thickness at the edge of a dry paint film in order to produce a smooth, continuous appearance.

### **Ferrous**

An iron containing metal.

- Filler**  
A compound used to extend or bulk a coating to provide extra body or hiding power.
- Film**  
A layer of coating or paint.
- Film Build**  
The dry film thickness characteristics of a coat.
- Film Integrity**  
The continuity of a coating free of defects.
- Film Thickness Gauge**  
A device for measuring wet or dry film thickness.
- Fineness of Grind**  
The degree of dispersion of particles within a liquid. [MORE](#)
- Fingering**  
A broken spray pattern delivering heavier paint to one area than another.
- Flammable**  
Any substance easily ignited in the presence of a flame; any liquid having a flash point below 100 F (37.8 C).
- Flash Point**  
The lowest temperature of a liquid at which sufficient vapor is provided to form an ignitable mixture when mixed with air.
- Flash-Off-Time**  
Time which must be allowed after the application of a paint film before baking in order that the initial solvents are released, which prevents bubbling.
- Flexibility**  
The degree at which a coating is able to conform to movement or deformation of its supporting surface without cracking or flaking.
- Floating (Flooding)**  
A concentration of one of the ingredients of the pigmented portion of a paint at its surface giving rise to a color change.
- Flow**  
The degree to which a wet paint film can level out after application so as to eliminate brush marks and produce a smooth uniform finish.
- Fluid Tip**  
The orifice in a spray gun to which the needle is seated.
- Fluorescent**  
A class of pigments which, when exposed to visible light, emit light of a different wave length producing a bright appearance.
- Force Drying**  
The acceleration of drying by increasing the ambient temperature.
- Foreign Thinner**  
Any thinner not recommended on the label or in published literature of the manufacturer, which can affect the coatings performance.
- Fouling**  
Marine growth such as weeds or barnacles adhering to the surface.
- Fungicide**  
A substance poisonous to fungi which retards or kills mold and mildew growth.

## - G -

### **Galvanic Anode**

A metal which, when properly connected to metallic structures of different composition, will generate an electric current.

### **Galvanic Corrosion**

Corrosion associated with the current of a galvanic cell made up of dissimilar electrodes.

### **Galvanized Steel**

Cold rolled steel which has been coated with a thin layer of metallic zinc by hot dipping or electroplating.

### **Gelled**

A coating which has thickened to a jelly like consistency making it unusable.

### **Generic**

Belonging to a particular family.

### **Gloss**

The sheen or ability to reflect light. [MORE](#)

### **Gloss Retention**

The ability to retain the original sheen during weathering.

### **Glycol Ether**

A group of relatively slow evaporating, strong solvents commonly utilized in epoxy coatings.

### **Grit**

An abrasive blasting media obtained from slag and various other materials.

### **Grit Blasting**

Abrasive blasting using grit as the blasting media.

## - H -

### **Hardener**

An activator curing agent, catalyst or cross linking agent.

### **Hardness**

The degree to which a material will withstand pressure without deformation or scratching. [MORE](#)

### **Hiding**

The ability of a coating to obscure the surface to which it is applied.

### **High Build**

A term referring to a paint film which can produce a thick film in a single coat.

### **Holiday**

Any discontinuity, bare or thin spot in a painted area.

### **Hot Rolled Steel**

Steel which has been formed while still hot, generally characterized by the presence of bluish-black mill scale.

### **Hydrocarbon**

Extracts from petroleum such as gasoline, lubricating oils, solvents, etc.

### **Hydrophilic**

A substance which absorbs or has an affinity for water loving.

### **Hydrophobic**

A substance which does not absorb or exhibit an affinity for water.

## **- I -**

### **Immersion**

Referring to an environment which is continuously submerged in a liquid, often water.

### **Impact Resistance**

The ability to resist deformation or cracking due to a forceful blow.

### **Incompatibility**

Unsuitable for use together because of undesirable chemical or physical effects.

### **Induction Time**

The period of time between mixing of two component products and the moment they can be used.

### **Inert Pigment**

A non-reactive pigment, filler or extender.

### **Inhibitive Pigment**

A pigment which assists in the prevention of the corrosion process.

### **Inorganic**

The designation of compounds that do not contain carbon.

### **Inorganic Zinc**

A coating based on a silicate resin and pigmented with metallic zinc which has excellent resistance to organic solvents and general weathering.

### **Intercoat Adhesion**

The adhesion between successive coats of paint.

### **Intercoat Contamination**

The presence of foreign matter such as dust or dirt between successive coats of paint.

### **Internal Mix**

A spray gun in which the fluid and air are combined before leaving the gun.

### **Intumescent Coating**

A fire retardant coating which, when heated, produces nonflammable gasses which are trapped by the film, converting it to a foam, thereby insulating the substrate.

### **Ion**

An atom or group of atoms possessing a positive or negative electric charge as a result of having lost or gained an electron.

### **Iron Oxide**

An oxide of iron. The natural occurring state of steel.

### **Isopropyl Alcohol (IPA)**

A volatile, flammable liquid used as a solvent commonly known as rubbing alcohol.

## **- J -**

(empty)

## **- K -**

### **Ketone**

An organic compound with a carbonyl group attached to two carbon atoms. Usually indicates a strong, fast evaporating solvent.

### **Krebs Units (KU)**

An arbitrary unit of viscosity for a Stormer viscosity instrument.

## **- L -**

### **Lacquer**

A coating comprised of a synthetic film forming material which is dissolved in organic solvents and dries by solvent evaporation.

### **Lacquer Thinner**

Commonly used term used to describe a solvent blend of ethyl alcohol, ethyl acetate and toluene.

### **Laitance**

An accumulation of fine particles, loosely bonded, on the surface of fresh concrete, caused by the upward movement of water.

### **Latex**

A stable dispersion of a polymer substance in an aqueous medium; a common term for water reducible coatings.

### **Lead-Free**

Contains, by weight, less than 0.5% lead for industrial products and less than 0.6% lead in consumer products.

### **Leafing**

The orientation of pigment flakes in a horizontal plane, usually aluminum.

### **Lifting**

Softening and raising or wrinkling of a previous coat by the application of an additional coat; often caused by coatings containing strong solvents.

## **- M -**

### **Mastic**

A term used to describe a heavy bodied coating.

### **Metalizing**

A method of applying atomized, molten metal such as zinc and aluminum to a surface.

### **Methyl Ethyl Ketone (MEK)**

A low boiling, highly volatile flammable solvent with extremely good solubility for most vinyls, urethanes and other coatings.

### **Methyl Isobutyl Ketone (MIBK)**

A medium boiling solvent commonly used in vinyl's.

### **Micron**

A micrometer or one millionth of a meter.

### **MIL**

One one-thousandth of an inch; 0.0001 inches. Commonly used to denote coating thickness.

### **Mildew**

A superficial growth of living organic matter produced by fungi in the presence of moisture; results in discoloration and decomposition of the surface.

**Mill Scale**

A layer of iron oxide formed on the surface of steel plates during hot rolling; bluish in appearance.

**Mineral Spirits**

A refined petroleum distillate having a low aromatic hydrocarbon content and low solubility; suitable for thinning of alkyd coatings.

**Miscible**

Capable of mixing or blending uniformly.

**Mist Coat**

A thin tack coat usually applied to fill porous surfaces such as zinc rich primers.

**Monomer**

A substance of low molecular weight molecules capable of reacting to form longer molecules called polymers.

**Mottled**

Spots of different tones and colors next to each other resulting in a blotchy effect on the coating film.

**Mudcracking**

A paint film defect characterized by a broken network of cracks in the film.

**Muriatic Acid**

Concentrated hydrochloric acid often diluted and used for etching concrete.

**- N -****NACE**

National Association of Corrosion Engineers.

**Neutral**

A liquid which is neither acid nor alkali such as water; pH7.

**Non-Drying Oil**

An oil which undergoes little or no oxidation when exposed to air and therefore has no film forming properties.

**Nonferrous**

A term used to designate metals or alloys that do not contain iron; example: brass, aluminum, magnesium.

**Nonflammable**

A compound which does not burn in the presence of a flame.

**Nonvolatile**

The portion of the paint left after the solvent evaporates; solids.

**- O -****Oil Length**

The ratio of oil to resin expressed as a percentage of oil by weight in the resin. Used to determine the physical properties of a resin.

**Opacity**

The ability of a paint film to obliterate or hide the color of the surface to which it is applied.

**Orange Peel**

The dimpled appearance of a dried paint film resembling the peel of an orange.

**Organic**

Designation of any chemical compound containing carbon.

**Organic Zinc**

A zinc rich coating utilizing an organic resin such as an epoxy.

**Osmosis**

The diffusion of liquid through a paint film or other such membrane.

**Overspray**

Sprayed coating that is dry when it hits the surface resulting in dusty, granular adhering particles, reducing gloss and presenting a poor appearance.

**Oxidation**

The formation of an oxide; the curing mechanisms for alkyds.

## **- P -**

**Paint**

(Verb) To apply a thin layer of coating to a substrate by brush, roller, spray or other suitable method.

(Noun) A pigmented liquid designed for application to a substrate, in a thin layer, which is then converted to an solid film. Paint is designed to protect and/or decorate the surface it is applied to.

**Pass**

The motion of a spray gun in one direction only.

**Passivate**

To make a surface such as steel inert or unreactive, usually by chemical means.

**Paste**

The product of a dispersion process. It is usually very high viscosity and requires dilution prior to application; a concentrated pigment dispersion used for shading.

**Pattern**

The shape or stream of material coming from a spray gun.

**Peeling**

A film of paint or coating lifting from the surface due to poor adhesion. Peeling normally applies to large pieces. (See chipping)

**Permeability**

The degree to which a membrane or coating film will allow the passage or penetration of a liquid or gas.

**pH**

A measure of acidity and alkalinity; pH 1-7 is acid and pH 7-14 is alkali.

**Phenolic**

A synthetic resin used for heat or water resistance.

**Phosphatizing**

A pretreatment of steel by a chemical solution containing metal phosphates and phosphoric acid to temporarily inhibit corrosion.

**Pickling**

The treatment of steel for the removal of rust and mill scale by immersion in a hot acid solution containing an inhibitor.

**Pigment**

A finely ground natural or synthetic, insoluble particle adding color and opacity or corrosion inhibition to a coating film.

**Pigment / Binder Ratio**

A ratio of total pigment to binder solids in paint.

**Pigment Grind**

The action of dispersing a pigment in a liquid vehicle.

**Pigment Volume Concentration (PVC)**

The percent by volume occupied by pigment in the dried film of paint generally expressed as a percentage.

**Pinholing**

A film defect characterized by small, pore-like flaws in a coating which extend entirely through the film.

**Plasticizer**

An agent added to the resin to aid in flexibility.

**Polyester Resin**

A group of synthetic resins which contain repeating ester groups. A special type of modified alkyd resin.

**Polymer**

A substance of molecules which consist of one or more structural units repeated any number of times.

**Polymerization**

A chemical reaction in which two or more small molecules combine to form large molecules containing repeated structural units.

**Polyurethane**

An exceptionally hard, wear resistant coating made by the reaction of polyols with a multi-functional isocyanate.

**Polyvinyl Chloride (PVC)**

A hard tough plastic solid used for plastics and coatings, commonly known as vinyl.

**Porosity**

The presence of numerous minute voids in a cured material.

**Pot Life**

The length of time a paint material is useful after its original package is opened or a catalyst or other curing agent is added.

**Potable Water**

Water fit for human consumption; as in drinking water.

**Practical Coverage**

The spreading rate of a paint calculated at the recommended dry film thickness and assuming 15% material loss.

**Primer**

The first coat of paint applied to a surface, formulated to have good bonding, wetting and inhibiting properties.

**Profile**

The term used to describe the anchor pattern of a surface produced by sandblasting, acid etching or similar method.

**Pyrometer**

An instrument used to measure the temperature of a surface.

**- Q -****QUV**

An accelerated testing device designed to evaluate the fading properties of a coating by exposure to high intensity, ultraviolet light.

## **- R -**

### **Reducer**

Commonly known as thinner.

### **Reflectance**

The ratio of the intensity of reflected light to that of incidental light.

### **Relative Humidity**

The ratio, expressed as a percent, of the quantity of water vapor actually present in the air to the greatest amount possible at a given temperature.

### **Resin**

A group of organic materials, either natural or synthetic, which can be molded or dissolved.

### **Rheology**

The science characterizing fluid deformation or flow.

### **Roller**

A cylinder covered with lamb's wool, felt, foamed plastics or other materials used for applying paint.

### **Runs**

Sagging and curtaining of a coating or paint film, usually caused by improper thinning, excessive film build or poor application techniques.

### **Rust**

The corrosion of steel or iron is an electrochemical phenomena wherein the base metal reverses to a lower, more stable energy state. If the corrosive environment is water or brine, then the corrosion product formed is commonly know as rust.

In the case of other chemicals, such as alkali's or acids, other combinations of iron salts are formed as part of the corrosion product. The electrochemical corrosion process may be retarded or sped by the proper use of protective coatings.

One preventive method provides an insulation barrier between the corrosive environment and the metallic substrate. An even more effective method is to use a more reactive metal such as zinc. A conductive zinc-filled coating protects the metal by galvanic protection. The zinc sacrifices itself and corrodes in preference to the steel.

## **- S -**

### **Sag Resistance**

The ability of a paint to be applied at proper film thickness' without sagging.

### **Sagging**

The downward movement of a paint film on a vertical surface, between the time of application and drying, resulting in an uneven coating having a thick lower edge.

### **Salt Atmosphere**

A moist, heavily laden air with a high chloride concentration; used as a test for accelerated corrosion evaluations and also present near sea coast areas.

### **Salt Fog Test**

A cabinet designed to accelerate the corrosion process in evaluating coatings; combines 100% humidity with a 5% salt concentration at 100 F in an enclosed cabinet.

### **Saponification**

The alkaline hydrolysis of fats whereby a soap is formed; typical reaction between alkyds and galvanized metals resulting in peeling.

### **Satin Finish**

A descriptive term generally referenced to paints with a 60 gloss reading between 10 and 40.

- Sealer**  
A coating used on absorbent surfaces prior to painting.
- Settling**  
The sinking of pigments, extenders or other solid matter in a paint, on standing in a container, with a consequent accumulation on the bottom of the can.
- Shade**  
A term employed to describe a particular hue or tone.
- Shelf Life**  
The maximum time interval in which a material may be kept in a usable condition during storage.
- Shop Primer**  
An inexpensive, rust inhibiting primer designed to protect steel from general weathering immediately after fabrication and before final coating.
- Shot Blasting**  
Abrasive blasting with round iron shot, or any material which retains its spherical shape, for peening purposes.
- Silica Sand**  
Clean sand made up of sharp silica particles, not containing dirt or clay, used for abrasive blast cleaning.
- Silicone Resins**  
Resins based on silicone instead of carbon, generally used for their outstanding heat resistance and water repellence.
- Skinning**  
The formation of a solid membrane on the surface of a liquid, caused by partial curing or drying of the coating during storage.
- Solids by Volume**  
The percentage of the total volume occupied by nonvolatile compounds.
- Solvent**  
A liquid in which another substance may be dissolved.
- Solvent Entrapment**  
The encapsulation of solvent within a cured paint film due to improper drying conditions; results in a non-continuous film.
- Sound Rusted Substrate**  
A rusted substrate cleaned of all loose rust and other loose materials, but not cleaned to bare metal.
- Specification**  
A set of instructions detailing the plan for coating of a project; a list of criteria for a coating.
- Spray Head**  
The combination of needle, tip and air cap.
- Spray Pattern**  
The configuration of coating sprayed on the surface.
- Spread Rate**  
Coverage, usually at the specified dry film thickness.
- SSPC**  
Steel Structures Painting Council; for more information about SSPC visit their WEB site at [www.SSPC.org](http://www.SSPC.org).
- SSPC-SP 1**  
Covers the requirements for the solvent cleaning of steel surfaces. A method for removing all visible oil, grease, soil, drawing and cutting compounds, and other soluble contaminants from steel surfaces. Intended for use prior to the application of paint and in conjunction with surface preparation methods specified for the removal of rust, mill of rust, mill scale or paint.

## **SSPC-SP 2**

Covers the requirements for the hand tool cleaning of steel surfaces. A method of cleaning steel surfaces by the use of non-power hand tools. Removes all loose mill scale, loose rust, loose paint, and other loose detrimental foreign matter. It is not intended that adherent mill scale, rust, and paint be removed by this. Mill scale, rust, and paint are considered adherent if they cannot be removed by lifting with a dull putty knife. ISO 8501-1:1988 or other usual standards may be used to further define the surface, if agreed upon by all parties involved.

## **SSPC-SP 3**

Covers the requirements for the power tool cleaning of steel surfaces. A method of preparing steel surfaces by the use of power assisted hand tools. Removes all loose mill scale, loose rust, loose paint, and other loose detrimental foreign matter, it is not intended that adherent mill scale, rust, and paint be removed by this process. Mill scale, rust, and paint are considered adherent if they cannot be removed by lifting with a dull putty knife. ISO 8501-1:1988 or other visual standards of surface preparation agreed upon by the contracting parties may be used to further define the surface.

## **SSPC-SP 5**

Covers the requirements for white metal blast cleaning of steel surfaces by the use of abrasives. When viewed without magnification the surface shall be free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter. Acceptable variations in appearance that do not affect surface cleanliness include variation caused by the type of steel, original surface condition, thickness of the steel, weld metal, mill or fabrication marks, heat treating, heat affected zones, blasting abrasive, and differences in the blast pattern. SSPC-VIS 1-89 or other visual standards of surface preparation may be specified to supplement the written definition.

## **SSPC-SP 6**

Covers the requirements for commercial blast cleaning of steel surfaces by the use of abrasives. When viewed without magnification the surface shall be free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products and other foreign matter, except for staining as noted below. Staining shall be limited to no more than 33% of each square inch of surface area and may consist of light shadows, slight streaks or minor discoloration's caused by stains of rust, stains of mill scale, or stains of previously applied paint. Slight residues of rust and paint may also be left in the bottoms of pits, if the original surface was pitted. SSPC-VIS 1-89 may be used to supplement this written spec.

## **SSPC-SP 7**

Covers the requirements for brush-off blast cleaning of steel surfaces by the use of abrasives. When viewed without magnification the surface shall be free of all visible oil, grease, dirt, dust, loose mill scale, loose rust, and loose paint. Tightly adherent mill scale, rust and paint may remain on the surface. Mill scale, rust and paint are considered adherent if they cannot be removed by lifting with a dull putty knife. The entire surface shall be subjected to the abrasive blast. The remaining mill scale, rust or paint shall be tight. SSPC-VIS 1-89 may be used to supplement the written spec.

## **SSPC-SP 8**

Covers the requirements for the pickling of steel surfaces. A method of preparing steel surfaces by chemical reaction, electrolysis, or both. The surfaces when viewed without magnification shall be free of all visible mill scale and rust.

### **SSPC-SP 10**

Covers the requirements for near-white blast cleaning of steel surfaces by the use of abrasives. Near-white blasted surfaces, when viewed without magnification, shall be free of all visible oil, grease, dirt, mill scale, rust, paint, oxides, corrosion products, and other foreign matter, except for staining as noted below. Staining shall be limited to no more than 5% of each square inch of surface area and may consist of light shadows, slight streaks, or minor discoloration's caused by stains of rust, stains of mill scale, or stains of previously applied paint.

## **SSPC-SP 11**

Covers the requirements for power tool cleaning to produce a bare metal surface and to retain or produce a surface profile. (1 mil minimum) Suitable where a roughened, clean, bare metal surface is required, but where abrasive blasting is not feasible or permissible. Differs from SSPC-SP 3 in that SP 3 requires only the removal of loosely adherent materials and does not require producing or retaining a surface profile. Surfaces prepared per this spec, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxide, corrosion products, and other foreign matter slight residues of rust and paint may be left in the lower portions of pits if the original surface is pitted.

## **Stress Corrosion Cracking**

Spontaneous cracking produced by the combined action of corrosion and static stress.

## **Strong Solvent**

Any solvent capable of dissolving large quantities of a specified subject.

## **Substrate**

The surface to be painted.

**Surfacer**

Pigmented composition for filling depressions in order to obtain a smooth, uniform surface before applying the finish coat.

**Surfactant**

An additive which reduces surface tension thereby improving wetting or helping to disperse pigments or inhibit foam.

**Suspension**

A relatively coarse, non-colloidal dispersion of solid particles in a liquid.

**Synthetic**

Manufactured, as opposed to naturally occurring.

**- T -****Taber Abraser**

An instrument used to measure abrasion resistance. You may find more information about this product at [www.taberindustries.com](http://www.taberindustries.com).

**Tails**

Finger-like spray pattern produced by improper gun or coating material adjustment.

**Tape Time**

The drying time of a coating required prior to masking sections for lettering or striping after which tape will not distort the finish.

**Thermocouple**

A temperature measuring device.

**Thermoplastic**

Resins having the property of becoming soft upon the application of heat but which regain hardness after cooling.

**Thermosetting**

Resins having the property of becoming insoluble or hard upon the application of heat.

**Thinners**

A liquid (solvent) added to a coating to adjust viscosity.

**Thixotropic**

An adjective which describes full bodied material which undergoes a reduction in viscosity when shaken, stirred or otherwise mechanically disturbed but which readily recovers its original full bodied condition upon standing.

**Toluene**

An aromatic solvent with a high boiling range and low flash point classified as a strong solvent.

**Tooth**

The profile, mechanical anchor pattern or surface roughness.

**Two-Pack**

A coating which is supplied in two parts and must be mixed in the correct portions before use in order to cure.

**- U -****Undercoat**

The coat applied to the surface after preparation and before the application of a finish coat.

**Underfilm Corrosion**

Corrosion that occurs under films in the form of randomly distributed hair lines.

## - V -

### **Vapor Barrier**

A moisture-impervious layer which prevents the passage of water into a material or structure.

### **Vapor Transmission Rate**

The rate at which moisture passes through a material or coating.

### **Vehicle**

The liquid portion of a paint in which the pigment is dispersed. Comprised of binder and thinner.

### **Vinyl Copolymer**

A resin produced by copolymerizing vinyl acetate and vinyl chloride.

### **Viscometer**

One of several types of instrument for measuring a liquids viscosity. [MORE](#)

### **Viscosity**

A measure of fluidity of a liquid.

### **Viscosity Cup**

An efflux viscometer utilizing a measured volume of liquid flowing through a precise orifice.

### **Voids**

Holidays or holes in a coating.

### **Volatile Content**

The percentage of materials which evaporate from a coating.

### **Volatile Organic Compounds (VOC)**

A measure of the total amount of organic compounds evaporating from a coating film, excluding water.

### **Volume Solids**

The volume of the nonvolatile portion of a composition divided by the total volume expressed as a percent used to calculate coverage rate.

## - W -

### **Wash Primer**

A thin paint, usually a chromate, designed to promote adhesion or to be used as a barrier coat.

### **Water Blasting**

Blast cleaning of metal using high velocity water.

### **Water Spotting**

A surface defect caused by water droplets depositing a circular ring of contaminants.

### **Weatherometer**

A machine designed for the accelerated testing of coatings.

### **Weld Slag**

Amorphous deposit formed during welding.

### **Weld Splatter**

Beads of metal left adjoining the weld.

## Wet on Wet Application

As high solids coatings continue to grow in popularity, the statement of "wet on wet" application is used regularly. Over the past few years this statement has been used very loosely and its true meaning has been lost or misunderstood by many. As a clarification "wet on wet" is meant to be that the coating is applied in TWO separate coats or applications. Whenever possible contrasting colors should be utilized for the two coats to aid in the application. Typically the structure is coated with the first coat and the applicator then turns around and begins the second application. As an example, if you have an I-beam or a railcar, the complete structure has the first coat applied before the second coat begins. Depending upon what is being coated the time between coats will vary dramatically. The key to the whole concept is that it is two independent coats. By applying the coating in two distinctive coats or applications, it minimized the problems with pinholes, light millage areas, and solvent entrapment. The misconception has been that you can apply the total thickness requirement in one coat with multiple passes. Some of the problems associated with one coat are not alleviated by the thicker film.

## Wet Sandblasting

The incorporation of water into the sandblasting operation in order to minimize dust.

## Wetting

The ability of a vehicle to flow onto the surface in order to achieve a good bond.

## White Rust

The oxide of zinc formed on galvanized metal.

- X -

## Xylene

A flammable aromatic hydrocarbon solvent used in epoxies and fast drying alkyds.

- Y -

(empty)

- Z -

## Zinc Dust

Finely divided zinc metal used as a pigment in protective coatings.

## Zinc Phospho Oxide

A rust inhibitive pigment.

## Zinc Rich Primer

An anti-corrosion primer for iron and steel incorporating zinc dust in a concentration sufficient to provide cathodic protection.