

Clancy's Commercial

HIGH PERFORMANCE COATINGS

GLOSSARY OF TERMS

Acetone – A volatile solvent, excellent in mixtures (such as mixing with oil and water).

Acrylics – Resins resulting from the polymerization of esters of acrylic and methacrylic acids. Most acrylics require strong solvents, although some may be formulated using aromatic hydrocarbons without oxygenated solvents.

Additive – Any chemical added in small amounts to a coating to achieve specific properties (mar resistance, slip, etc.)

Air Dry Coating – a coating formulation that dries after application without the use of heat.

Alcohol – Latent solvents for many materials. Characterized by the presence of a hydroxyl group. Capable of strong hydrogen bonding. Oxygenated solvents.

Alkyds – Synthetic resins formed by the condensation of polyhydric alcohols and polybasic acids. They may be regarded as complex esters. Most commonly made from glycerin and phthalic anhydride. Solvent requirements vary, ranging from strong aromatic hydrocarbons to low solvency aliphatic hydrocarbons.

Alkyd Paint – Paint made with synthetic resins which have good retention of colour and flexibility. Also oil-modified alkyd which contains a drying oil as part of its makeup.

Alkyd/Urea – Blend of resins most commonly used in conversion coatings. Releases characteristic formaldehyde odour.

Ammonium Chloride – Can be used for artificially 'aging' bronzes. However, chlorides cause 'bronze disease' a form of corrosion which spreads rapidly and has a destructive effect.

Aniline Cloud Paint – A measure of solvent strength used for aliphatic hydrocarbon solvents only. Defined as the minimum temperature at which a 1/1 by volume mixture of a hydrocarbon and pure aniline will be miscible with each other. Also known as Aniline Point and Aniline Number. ASTM Method D-611.

Architectural Coating – Coatings intended for on-site application to interior or exterior surfaces of residential, commercial, institutional, or industrial buildings. These finishes are applied at ambient temperatures and dry without being heated. Also called trade sales coatings.

Aromatics – Characterized by unsaturated, six carbon benzene ring structures. Hydrocarbon solvents which contain more than 50% aromatic compounds are designated as aromatic hydrocarbon solvents. Strongest of the hydrocarbon solvents. Strongest odour.

Auto Ignition Point – Temperature at which vapor from volatile material self-combusts.

Baking Finish – A coating which requires heating at temperatures above 150°F. for curing and the development of desired properties.

Base Solvent – The solvent blend which is used in the preparation of a coating for dissolving the resin and dispersing the pigments.

Bernard Cells – Small, rounded variations in the surface colour in opaque films caused by eddies and currents created from the evaporation of solvents.

Binder/Backbone – The name given to the blend of resins in a coating which gives a film most of its properties.

Black – The absence of colour. Zero brilliance and 100% saturation.

Blister – Film defect which occurs when volatiles leaving a film are trapped and expand inside the film.

Bloom – A clouding of the finish material coming in contact with dirt or moisture.

Blush – a milky appearance in a film created when airborne moisture condenses in a film cooled by evaporating solvents.

Bozetto – In sculpture, a small model in wax or clay, made as a preliminary sketch presented to a client for approval of the proposed work. In Italian, *bozetto* means “small sketch”.

Brilliance – The percentage of incident light reflected by an object. A perfectly white material has 100% brilliance while an absolute black material has zero brilliance.

Build – The apparent depth a coating gives to its substrate.

Building Block – a relatively narrow boiling range hydrocarbon which may be combined with other narrow range hydrocarbons to form a multitude of blends precisely formulated to meet requirements. The building block approach employs cuts which are predominately aromatic or predominantly aliphatic in nature. The boiling range varies from very low boiling petroleum ether type solvents to kerosene type materials.

Butyrate – UV resistant resin with characteristics of a lacquer. Used where light stability and good flow are needed.

Casein – a paint binder which is manufactured by allowing or causing skim milk to sour, separating the curd from the whey, and washing and drying it. When mixed with pigments, produces a finish that is more resistant to moisture than those using glue or gelatin, making it particularly suitable for mural painting.

Catalyst – The highly reactive chemical which when added to conversion coatings initiates chemical bonding.

Chlorinated Hydrocarbons – Characterized by the presence of chlorine.

Chromatic Scale – The colours of the spectrum, namely: red, orange, yellow, green, blue, violet. These six colours are related to each other as follows:

Colour	Approximate Wave Length (Millimicrons)	Colour Classification	Obtained by Mixing
Red	610 to 700	Primary	
Yellow	570 to 590	Primary	
Blue	460 to 500	Primary	
Orange	590 to 610	Secondary	Red and Yellow
Green	500 to 570	Secondary	Yellow and Blue
Violet	400 to 460	Secondary	Blue and Red
Citron		Tertiary	Orange and Green
Olive		Tertiary	Green and Violet
Russet		Tertiary	Violet and Orange

Coating – A generic term for paints, lacquers, enamels, etc. Also a liquid composition which is converted to a solid protective, decorative, or functional adherent film after application as a thin layer.

Cold Check – The cracks formed from the expansion and contraction which results from hot and cold cycles.

Colour – the quality by which bodies have a different appearance, independently of their form, depending on the effect of different wavelengths on the retina of the eye.

Colour Float – The tendency for certain pigments in a coating to rise to the surface in unagitated material.

Colourimeter – a computerized meter which digitally “fingerprints” a specific opaque colour according to its characteristic wavelengths of light.

Complementary Colours – Colours which together make white. Red and green, blue and orange, yellow and violet are complementary pairs of colours. Complementary colours from a given pair are always harmonious when used near each other as separate colours in the proper relative amounts.

Conversion – The process of chemically bonding or cross-linking the resins in a film.

Cosolvent – A blend of two or more solvents, none of which will dissolve the resin by itself, but which will act as a true solvent for the material when used together. Each cosolvent must evaporate at about the same rate, otherwise resin precipitation will occur as drying proceeds.

Coverage – Mileage, usually given in square feet per gallon for a given dry film thickness.

Crater – The “pulling away” from surface contamination which forms a crater-like deformation in the film.

Crazing – Term often used in place of cold checking.

Cross-link – The chemical bonding of resins (polymers).

Crystalline Wax – A blend of highly refined micro-crystalline fossil-origin waxes used to revive and protect valuable furniture, leather, paintings, metals, marble, onyx, ivory, etc. Freshens colours and imparts a soft sheen.

Damar Resin – A resin gathered from forest trees of the family *Dipterocarpaceae* in Malaysia and Indonesia, Damar is one of the few tree resins still approved for use in picture varnish and retouch varnish, and as an ingredient in painting mediums, emulsions, and encaustic colours. It dissolves in pure turpentine but not in petroleum solvents.

Definition of Image (DOI) – The degree of distortion in a reflected image on the surface of a high gloss coating.

Diluent – Materials used to thin paints, either to make them more workable or to give them a consistency which is suited to a particular technique. In theory a diluent is only a temporary addition to a paint and should evaporate evenly and completely during drying, leaving the original composition of the paint unchanged, and producing no lasting odour or stain.

Dispersion – The wetting-out of fine pigment particles with coating material.

Dissolution – The process of forming a solution, in which the resin dissolves in the solvent.

Distillation Range – the temperature range over which a mixture of liquids will distill. The range is narrow for most oxygenated solvents, but may be quite wide for hydrocarbons. ASTM Method D-86 is used for hydrocarbons.

Electronic Grade – Electronic industry solvent specifications are concerned mostly with metals content, especially heavy metals. Most solvents will meet those specifications as produced. However, contamination during shipping and handling can occur very easily, rendering the solvent unsuitable. Particulate matter is also important. Since dust is everywhere, careful filtration is needed at the point of use in the electronics plant.

Enamel – A topcoat which is characterized by its ability to form a smooth surface. May also refer to a thermosetting or baking finish.

Epoxy Resin – Resins which contain epoxy groups (also known as oxirane groups). Most commonly made from epichlorohydrin and bisphenol A. May be liquid or solid, depending on molecular weight. Uses mixtures of alcohols, ketones, and hydrocarbons.

Ester – A class of active solvents formed from organic acids and alcohols by the elimination of water, i.e. Oxygenated solvents.

Ethanol (or Ethyl Alcohol) – A volatile solvent widely used in industry, but of relatively minor importance to artists. It is the solvent for shellac and a few other resins, a diluent for some of the fixatives, and a mildly active wetting agent.

Evaporation Profile – The relationship of evaporation out of a film as a function of time produced by a blend of solvents in a coating.

Evaporation Rate - A measure of the length of time required for a given amount of a solvent to evaporate. Solvents are generally characterized as fast, medium or slow evaporating. Most commonly measured using the Shell Thin-Film Evapometer, ASTM Method D-3539.

Filler – Highly pigmented material used to fill the open pores of wood before the application of a coating.

Fisheye – A type of crater but is usually larger and sometimes contains a particle of contamination.

Flashpoint – The temperature at which a vapor from a volatile material will combust if externally ignited.

Flash Off – The initial evaporation of solvent from an applied film.

Flexibility – The elasticity a coating needs to overcome physical deformation.

Flow – The ability of a material to level-out over surface defects.

Flyspeck – Small specks of colour lightly splattered onto a surface to add aesthetics.

Fractional Polarity – A measure of the polar character of a solvent. Values are between zero and one, the higher the value, the more polar the solvent. Hydrocarbons have very low polarity, while oxygenated solvents have higher polarity.

Gelatin –A protein material made by prolonged boiling of animal tissues – a highly refined glue. The best grades of gelatin are odourless, colourless, and tasteless. It is often recommended as a binder for gesso.

Gesso – A white fluid or plastic coating material made by mixing chalk or whiting with a glue solution or, occasionally, casein. Early gesso was made from parchment glue and slaked plaster of Paris; modern gesso uses rabbit skin glue and precipitate chalk or whiting. The word gesso is Italian, a derivative from gypsum (from which plaster of Paris is made). However, manufacturers in recent years have applied the term gesso to polymer primers, which are entirely different from gesso in composition and cannot be used as a substitute for it.

Gilding – To cover with gold or a golden finish, whether by applying gold leaf, by electroplating or metal spraying or applying gold paint.

Gloss – The degree to which a coating is able to reflect an image.

Glycol Ethers – Prepared from alcohols and ethylene or propylene oxide. Contain both ether groups and hydroxyl groups, thereby possessing the characteristics of both. Oxgenated solvents.

Gouache – Opaque watercolour, a member of the tempera family.

Gum Mastic (or Mastic Resin) – Resin obtained from a tree (*Pistachia Lentiscus*) that grows in the countries bordering the Mediterranean. It comes on the market in pale amber-coloured drops or tears the size of peas. Mastic is soluble in both alcohol and turpentine. A turpentine solution was popular as a picture varnish during the 19th century when a smooth, high-gloss finish for oil paintings was admired. It was superseded in the first half of the 10th century by Damar.

HLVP – A finishing spray method that uses a high volume of air at a low pressure to atomize paint into a pattern of low speed particles, thus producing better transfer efficiency than conventional air.

House Paint – A coating designed for use on large exterior surfaces of a building. Generally of lower gloss than the coating used on trim areas. May be either water based or oil based.

Hue – The predominate wavelength reflected by a coloured material which determines its position in the chromatic scale.

Hydrocarbons – Compounds composed exclusively of hydrogen and carbon.

Hydrogen Bonding Index – Measures the strength of the hydrogen bonding that occurs in a solvent. Values range from -18 to +15. Hydrocarbons display little intermediate between these two extremes.

Infrared Reflectography – Infrared (IR) reflectography is used to visualize the surface of the ground layer of ancient paintings, hidden by the paint layers. The technique dates back to the early 1930's, and was started as infrared photography. Reflectography makes use of radiation in the near infrared region of the spectrum, that is the range of wavelengths from about 1 up to 2 microns.

Intercoat Adhesion – The adhesion a topcoat has to a bottom coat.

Jettness – Refers to how deep a black coating looks when compared to other black coatings.

Kauri-Butanol Value – A measure of solvent strength used for hydrocarbon solvents only. A solution of Kauri gum in n-butyl alcohol is titrated to a specified degree of turbidity with the hydrocarbon solvent being tested. Values range from 20+ to 105, the higher values denoting stronger hydrocarbon solvency. ASTM Method D-1133.

Ketones – A class of active, strong solvents characterized by a carbonyl group. Oxygenated solvents.

Lacquer – A coating based on a thermoplastic polymer dissolved in organic solvent and which dries primarily by solvent evaporation. The coating can be redissolved in its original solvent blend. The most common polymers used in lacquers are nitrocellulose, vinyl resins and acrylic resins.

Laropal K-80 (ketone resin) - Laropal[®] is the trade name for aldehyde and ketone resins. These resins are added to all types of coatings formulations to improve properties such as gloss, film hardness, flow and UV stability. In addition, thanks to their excellent pigment-wetting properties and broad compatibility with other resins, they can be used to make all-purpose pigment preparations.

Latent Solvent – A solvent which is not a true solvent for the material being dissolved, but which will act as a solvent in the presence of an active solvent. Alcohols are the most common latent solvents.

Latex – A stable dispersion of a polymer in a continuous liquid medium, usually water. Prepared by emulsion polymerization.

Latex Paint – A coating which uses a latex as the principal binder. Widely used for interior and exterior house paints. Contains only small amounts of solvents, usually glycols, glycol ethers and glycol ether esters.

Lifting – The wrinkle or seedy look which occurs from the stripping effect a topcoat with active solvents has on a cured bottom coat.

Mar Resistance – Ability of the dry film to resist scratching.

Masstone – A full strength colour. The hue of a colour not toned with white or black.

MEK Rubs – a way of determining solvent resistance and extent of cure by rubbing the surface of a coating with a cloth laden with methyl ethyl ketone.

Metamerism – The characteristic of a colour which enable it to appear differently under various types of lighting.

Mil – 1/1,000th of an inch.

Mileage – The number of pieces or the square feet which are able to be coated by 1 gallon of material at a specific coating depth in mils.

Mixed Aniline Cloud Point – a measure of solvent strength used for aromatic hydrocarbon solvents only. The same method is employed as for the aniline cloud point used for aliphatic hydrocarbons, except that the aromatic hydrocarbon is diluted with an equal volume of pure n-heptane before mixing with aniline. ASTM Method D-611.

Monomer – a small reactive molecule which chemically bonds to form a polymer.

Naphthenes – Completely saturated hydrocarbons characterized by ring structures. Intermediate solvency between paraffin and aromatic hydrocarbons. Intermediate odour. Also known as cycloparaffins.

National Formulary Grade (NF) – Standard for certain pharmaceuticals and reagents published by the American Pharmaceutical Association. Recognized as official standards by the Pure Food and Drug Act of 1906. Since 1974, the National Formulary has been combined with the United States Pharmacopoeia.

Neutral Colour – A colour in which the hue is broken by admixture of white and black, or by partaking of the reflected colours of other objects which surround it.

Nitrocellulose – A resin used in lacquers for clarity, quickness of drying and repairability.

Nitroparaffins – Characterized by the presence of a nitro group.

NGR Stain – A non-grain raising stain used to give uniformity and transparency to the colour of a substrate.

Nonaqueous Dispersion (NAD) – The solvent analog of a latex – a dispersion of a polymer in a volatile organic liquid which is not a solvent for the polymer. Low-solvency aliphatic hydrocarbons are the most commonly used solvents.

Oil Paint – Paint that contains a drying oil as the sole film-forming ingredient. Linseed oil is most commonly used for this purpose. Aliphatic hydrocarbons are used in small amounts as the solvent.

Olefins – Characterized by unsaturation. Relatively reactive, used as a raw material for most solvents. Not used in solvents directly, although traces of olefins may be found in some hydrocarbon solvents.

Orange Peel – The slight “bumpy” appearance a sprayed surface has when the coating does not have enough flow.

Organic – The term that refers to any compound that contains carbon atoms.

Overspray – The atomized spray material which misses the desired substrate and lands on an undesirable area.

Oxygenated Solvent – general designation of those solvents which contain oxygen in addition to carbon and hydrogen.

Pad Stain – The stain applied to blend in off-colour regions of wood

Paint – Any pigmented liquid designed for application to a substrate in a thin layer which is converted to an opaque solid film after application. Used for protection, decoration or identification, or to serve some functional purpose such as the filling or concealing of surface irregularities, the modification of light and heat radiation characteristics, etc.

Paraffins – Completely saturated hydrocarbons characterized by chain structure. Poorest solvency of the hydrocarbon solvents. Least odour.

Pastel – A tint. A masstone to which white has been added.

Patina – A thin layer or corrosion, usually brown or green, that appears on copper or copper alloys, such as bronze, as a result of natural or artificial oxidization. In general, a patina is the sheen produced by age and use on any antique surface.

Picture framing – The tendency of a material to pull away from the centre of a substrate and gather at the sharp edges.

Pigment – A finely divided, coloured substance which imparts its colour effect to another material, either when mixed intimately with it or when applied over its surface in a thin layer. When a pigment is mixed or ground in a liquid vehicle to form a paint, it does not dissolve but remains dispersed or suspended in the liquid.

Pigment Load – The amount of dry pigment in a coating.

Pigment to Binder ratio – The amount of dry pigment compared to the amount of resin solids.

Pinhole – A surface defect with the appearance of a blister that “popped” but did not flow out.

Polyester Resins – A special type of alkyd resins, prepared from dicarboxylic acids and dihydroxy alcohols.

Polymer – A large molecule which is formed by chemically bonding monomers. Many times they can be further reacted to form larger polymers.

Pot Life – The length of time in which a material is still usable after catalyzation.

Primary Colours – Red, yellow and blue.

Primer – First complete coat of paint applied to a surface. It is designed to provide adequate adhesion to new surfaces. The type of primer varies with the surface, its condition, and the total painting system to be used.

Print Resistance – The ability of a recently cured coating to resist the imprint of an applied force.

Pure Bleed – The migration of solvent and pigment out of the pores of wood after stain or filler has been applied.

Radio-Carbon Dating – A method of obtaining age estimates on organic materials. Radioactive carbon (C14) is produced in the atmosphere, drifts down to earth, and is absorbed by plants. They, in turn, are eaten by animals which take the radioactive carbon into their bodies. When a living organism dies, it stops absorbing C14 and the C14 already in the object, begins to disintegrate. The amount left and the rate of decay can help to date an object.

Recoatability – The ability to apply a fresh coat of material over a cured dry coat without lifting or loss of adhesion.

Relative Evaporation Rate – The evaporation rate of a solvent compared to a standard, usually n-butyl acetate, with the rate of n-butyl acetate set equal to 1.00. Solvents which evaporate faster than n-butyl acetate, have a relative evaporation rate greater than one. Those which evaporate more slowly have a relative evaporation rate less than one.

Repairability – the ability to physically remove and repair defects from a coating's surface.

Rheology – The term which is used to describe the flow, viscosity and thixotropy of a material.

Roping – A shear-related surface defect a coating forms when it is transferred from a roll applicator to the substrate.

Rubability – The ability to easily rub or polish a coating without leaving surface defects or haze.

Sags – Areas of uneven coating produced by flow of excessively thick layers of wet material.

Sandability – The ease at which a coating can be sanded without dragging or gumming the sanding medium.

Saturation – The percentage of reflected light which is coloured.

Sealer – A coating which slightly raises the wood grain fiber, and seals the wood grain fiber and seals the wood. Upon sanding it leaves a smooth surface and provides build.

Secondary Colours – Orange, green and violet. Mixtures of primary colours.

Shade – A colour toned with black or with a complementary colour having some degree of dulling effect.

Shellac – Orange coloured resin which is the secretion of the Lac beetle found in greater quantities in India and Indochina. Shellac is ordinarily dissolved in denatured ethyl alcohol.

Shrinkage – Usually associated with extensively cross linked films, visible by the amount of curling induced on the substrate.

Slip – The degree to which tactile friction is absent from a film.

Solubility Parameter – A measure of solvency whose major usefulness is in predicting whether a particular solvent will dissolve a particular resin, based on heat of vaporization of the solvent. Stronger solvents generally have higher solubility parameter values.

Solvent (Active) – A solvent which by itself will dissolve a resin.

Solvent – A liquid, usually volatile, which is used in the manufacture of coatings, to dissolve or disperse the film-forming constituents and which evaporate during drying (does not become part of the dried film). Solvents are used to control the viscosity and application properties of the finished material.

Solvent Power – A general term denoting the ability of a solvent to dissolve a resin or binder, and hold it in solution. Also known as solvency.

Spectrum – The bands of colour seen when white light, especially light from the sun, is broken up by refraction, as in a rainbow or prism.

Sprayability – The degree to which a coating can be finely atomized at the tip of a spray gun.

Stain – a pigmented material which can be sprayed or wiped onto wood to accent the grain patterns.

T-90 – the length of time required for 90% of the weight of the solvent to evaporate. Another convenient way to compare the evaporation rates of solvents.

Telegraphing/Ghosting – The transmitting of surface irregularities in a bottom coat through to a topcoat.

Thermoluminescence Dating – This type of dating is based on the fact that almost all natural minerals are thermoluminescent. Energy absorbed from ionizing radiation frees electrons to move through the crystal lattice and some are trapped at imperfections. Later heating releases the trapped electrons, producing light. Measurements of the intensity of the luminescence can be used to determine how much time has passed since the last time the object was heated. The light is proportional to the amount of radiation absorbed since the material was last heated. Natural radioactivity causes latent thermoluminescence to build up so the older and object is, the more light is produced.

Thermoplastic Resin – Resin which remains fluid on heating and hardens when cooled. Remains soluble in the original solvent blend and does not become insoluble upon heating.

Thermosetting Resin – Resin which polymerizes to a permanently solid and infusible state upon the application of heat. Once heated, will not dissolve in the original solvent blend.

Thinner (Reducer) – A blend of solvents used to lower the viscosity of the coating prior to application.

Thixotropy – The tendency of a coating to be low in viscosity under agitation but to “body-up” or become viscous when not agitated.

Toughness – The ability of a film to absorb physical abuse without failure.

Transfer Efficiency – The difference between the amount of finishing material solids deposited on the surface of the part compared to the total amount of finishing material solids sprayed.

Turpentine – A colourless, liquid made by distilling the thick resinous sap of pine and similar coniferous trees. Considered the best diluent (thinner) for oil paint.

Ultra-violet Light – The light rays which are outside of the visible spectrum at its violet end.

United States Pharmacopoeia Grade (USP) – A legally recognized compendium of standards for drugs, published by The United States Pharmacopoeial Convention, Inc., and revised periodically. It also includes assays and tests for the determination of strength, quality and purity. The USP lists specifications for a number of solvents used in the pharmaceutical industry. Specifications covering specific gravity, distillation range, residue on evaporation and acidity, are the most common. For materials for which a USP standard has not been established, the ACS Reagent grade is frequently specified. The American Chemical Society standards are published in ACS Reagent Chemicals.

Urethane Grade – Any substance which contains active hydrogens capable of reacting with isocyanate will be restricted to very low levels. Specifications for urethane grade solvents typically centre on very low water and alcohol contents, typically 0.1% water or less. Glycol ethers also contain active hydrogens and are not suitable for use in urethanes. Historically, esters have contained significant amounts of alcohol. More recently, alcohol free grades of esters have been produced with the designation “Urethane Grade”. The usual quality grades of hydrocarbons and ketones ordinarily are suitable for urethanes, even though they may not be designated specifically as urethane grade.

Urethane Resins – Materials based on Isocyanate monomer reacted with other materials to yield polymers containing any ratio of urethane linkages, active Isocyanate groups or polyisocyanate monomer. The resin may contain excess Isocyanate groups available for further reaction at the time of application, or may contain essentially no free Isocyanate as supplied.

UV Cure – The cross-linking of a material upon exposure to ultraviolet radiation.

UV Resistance – The resistance a cured film has against yellowing or chalking when exposed to ultraviolet radiation.

Varnish – A solution of resin dissolved in turpentine. Also, a liquid composition which is converted to a transparent solid film after application as a thin layer. Once the film has completely dried, it will no longer dissolve in the solvent blend from which it was applied.

Veneer Check – A crack that forms along the wood grain in a veneered substrate which subsequently cracks the coating surface.

Vinyl Resins – Resins based on vinyl chloride monomer. Most frequently copolymerized with other monomers such as vinyl acetate. Most vinyl resins require very strong solvents, such as ketones, to form useful solutions.

Viscosity – The degree to which a coating resists flow or movement.

Viscosity Cup – Instrument used to measure the rate of flow or movement of a material. Measured in elapsed time a material requires to pass through a given opening at a given temperature.

Viscosity Profile – The variation in viscosity a coating exhibits as a function of temperature.

VOC – The weight of volatile organic material in 1 gallon of coating.

Volatile – Any material which can evaporate under normal operating conditions.

Washcoat – A low-solids coating applied under a stain to limit penetration of the pigments into the wood.

Whiting – Native calcium carbonate, ground, washed and refined. An inert pigment used in oil painting as an extender or adulterant. When ground in oil to a stiff paste, it does not retain its white or creamy-white colour, but the past is yellowish brown. When used with aqueous mediums, it retains its whiteness.

Wipe Stain – A pigmented material which can be sprayed or wiped on wood to colour it, and to accent grain patterns.

X-Radiography – An X-ray image of the internal structure of an object is called a Radiograph. The object is called the Specimen. The Specimen is placed between an X-ray generator, called the Source, and the recording medium, called the Target. In medical or art museum X-Radiography, the recording medium is special photographic film that is sensitive to X-rays. X-ray film becomes exposed wherever X-rays strike the Target. More X-rays at the Target cause greater exposure of the film and fewer X-rays at the Target cause less exposure of the film. Where the Specimen blocks the X-rays by absorbing them, the Target does not get exposed. On the other hand, where the Specimen does not absorb the X-rays, they pass through the Specimen and the Target becomes very exposed. In most cases, the amount of exposure at the Target can vary continuously from fully exposed, to not exposed at all, depending on the internal structure and composition of the Specimen. Upon development of the X-ray film, the differences in exposure produce differences in contrast on the film. This pattern of contrast corresponds to the internal structure of the object. Radiographs produced in this way are essentially still photographs of the internal structure of the Specimen. Areas of the film that are not exposed correspond to thick part of the Specimen or to parts of the Specimen that are made from elements with high atomic numbers, such as iron or lead.

X-Ray Fluorescence – X-ray fluorescence (XRF) spectrometry is one of the most widely used and versatile of all instrumental analytical techniques. An XRF spectrometer uses primary radiation from an X-ray tube to excite secondary emission from a sample. The radiation emerging from the sample, includes the characteristic X-ray peaks of major and trace elements present in the sample. Dispersion of these secondary X-rays into a spectrum, usually by X-ray diffraction, allows identification of the elements present.