PAINT, VARNISH AND LACQUER RAW MATERIAL

White Lead is one of the most opaque White pigments in common use wherever White pigment of dense covering quality is required. Used chiefly for Outside House Paints. It is indispensable in best quality paints used for this purpose.

Basic White Lead Carbonate was used by the ancients; was called Cerussa, a natural mineral carbonate of lead found in small quantities in Europe.

White Lead is marketed for House Painting, ground in Oil 91% Lead - 9% Oil; or 87% Lead, 11% Oil and 2% Turpentine as a soft paste. Much of such Lead in Oil is made by passing the wet pulp lead directly from the washing tubs into a pulper and mixing with oil by a process which forces the water out, thus avoiding drying and grinding expense.

Old Dutch Process discovered by Stratingh about 1600 A.D. Patented in England in 1622. Made first by Sherwin-Williams Co. at Chicago in 1910. Metallic Lead in shape of discs or buckles 6" in diameter placed in pots containing weak acetic acid in recessed bottom, piled up in "stacks"; pots covered with tanbark; remain in "stack" 120 days; carbonic acid generated from tanbark and acid vapors corrode the metal into basic lead carbonate with chemical gain of about 25%. Corroded pigment is washed, purified to separate uncorroded lead particles; dried and ground into a dry powder for use by paint manufacturers.

Quick Process Lead first developed as chamber process by Sir James Creed, England in 1849. Carter process patented in 1839. S-W began manufacture of Carter process at Chicago in 1921. Metallic lead melted, atomized, placed in large cylinder treated with diluted acetic acid and carbonic acid gas. Process requires eight days and chemical gain is 25%. Generally whiter and lighter specific gravity than Old Dutch.

Electrolytic Process "Anaconda" - patented in 1919 - lead plates as anodes suspended in solution of sodium acetate-cathodes iron plates suspended in solution of sodium carbonate.

Precipitated Euston Lead is made by treating a basic lead acetate solution with carbon dioxide gas. The process is readily controlled at all stages and results in carbonate of greater uniformity, fineness, and generally whiter than other methods.

Lead Sulphate, basic or sublimed lead, was patented by Lewis in 1879. Lead ore mixed with powdered anthracite coal reduced and volatilized in a closed furnace; fumes are condensed and collected in fabric bags. Very similar in general qualities and use to lead carbonate except that it is less poisonous and more resistant to blackening action from sulphurous gases.

Sublimed Blue Lead produced in much the same way as lead sulphate; is practically inert in linseed oil; not affected by sulphuric gases; occupies a place among rust inhibitors.

Zinc Oxide discovered by Curtois in France in 1782. LeClair in 1845 found method to use it for oil paints. French process - vapors given off from burning zinc metal in current of air; fumes condensed and powders collected in closed chambers. American process - Wetherill patent in 1856. Zinc ore burned with powdered anthracite reduced and volatilized in closed furnace; fumes condensed and powder collected in bags. Zinc oxide very white color; French process generally whiter than American. Degrees of whiteness expressed as Red Seal, Green Seal, White Seal, or USP - the whitest grade. Both American and French process zinc oxides not affected by atmospheric gases. Zinc oxide used in house paints in combination with white lead to counteract the chalking tendency of lead. Used largely in enamels and in the rubber industry as an oxidizing agent.

Leaded Zincs first manufactured at Sherwin-Williams Company at Coffeyville in 1904. Produced from ores of zinc and lead sulphids. They are mixed with powdered anthracite and reduced and volatilized in closed furnace; fumes pass through condenser; powders collected in bags. Proportions of lead sulphate range from 5%, 10%, 20%, 35% and 50%, balance of zinc oxide. Whiteness of color generally inferior to zinc oxide. Chief use as ingredient for exterior house paints.

Zinc Sulphide made by passing hydrogen sulphide gas through solution of zinc sulphide. Has good opacity; very fine color; used commonly in enamels, lacquers and similar products requiring dense covering capacity.

Titanium Pigments: First attempt to use it as pigment was credited to J. W. Ryland in England 1869. Not developed definitely as white pigment until by Dr. Rossi of Titanium Alloy Company, Niagara Falls, in 1908. For a time material was made from Florida sands, but now primary source is Illmenite, a mineral found in India, chiefly 47% Iron, 53% Titanium Dioxide. Chemical treatment removes iron and pure TiO2 remains. Titanium Dioxide has very dense covering - very opaque. Shows some tendency to chalk. This is being overcome through treatment with phthalic anhydride. Reduced grades are marketed under name of Titanox B, 25% TiO2; 75% Barium Sulphate, and Titanox C; 25% TiO2; 75% Calcium Sulphate. Titanium pigments are all extremely fine; brilliantly white, inert to all paint, varnish and lacquer ingredients. Chief use for outside house paint, enamels, lacquers, rubber, and coated paper. War conditions making it difficult to import ore from India, a deposit in the Adirondack Mountains has been developed, making the U. S. practically independent from importations.

Lithopone patented in England in 1874 as Orr's White. First manufactured by Sherwin-Williams Co. Chicago 1917, and Coffeyville plant established in 1931. Zinc Sulphide precipitated with Barium Sulphate; chemical changes result in composition about 30% Zinc Sulphate and 70% Barium Sulphide. There are other forms - Calcium Lithopone, Titanium Lithopone, and high strength Lithopone. Consumption now exceeds all other white pigments. Chief use is for interior flat wall paints; is largely used for shade cloth, linoleum, white rubber, paper coating, and printing inks.

Inert or Reinforcing Pigments of many varieties are used in paint industry, most important of which are Barium Sulphate (Barytes); Magnesium Silicate (Asbestine); Silica (Silex); Alumina (China Clay) and Calcium Carbonate (Whiting).

Barytes is made by grinding ore (found chiefly in Missouri, Arkansas, Tennessee, West Virginia and North Carolina); then removing impurities in an acid bath, washing and bolting the powder. It is chemically stable; use chiefly to dilute high colored or expensive pigments.

Asbestine - Magnesium Silicate rock is ground, purified, and bolted or air-floated. Used in moderate proportion, it is fluffy and this keeps it in suspension paints.

Silica Rock is crushed, ground, purified and bolted or air-floated. Used largely in fillers and is a flattening agent in wall coatings and traffic line paints.

China Clay Alumina Rock is crushed, ground, washed, and floated. Very inexpensive, used in freight car paints and other low-priced paints.

Whiting - Calcium Carbonate from the chalk cliffs of the east coast of England is the best source. Ground, washed, floated in water, and dried. Chief use is in putty and as an extender for expensive pigments.

Earth Colors come down to us from ancient times. Are colored minerals or natural deposits utilized as pigments after grinding and purifying.

Iron Oxide, Red, Brown or Purple used chiefly for freight car paints, roof paints, barn and house paints, etc. Vary in color from Light Venetian Red to Dark Brown or Deep Maroon.

Ochres are Yellow Iron Oxide used chiefly in yellow freight car and barn paints.

Sienna used chiefly for tinting paints and enamels. Raw light neutral yellow producing ivory and tan tints. Burnt rich reddish brown color used for tinting and stains.

Umber chiefly used as tinting pigment, raw; a dark brown with tinge of green or olive. Burnt, warm, dark brown tint.

Red Lead and Orange Mineral are lead oxides formed by oxidizing lead exposed to low heat in a gas furnace; used chiefly as coating for metal surfaces.

Black in the form of soot from fires is perhaps the earliest pigment known.

Lamp Black made by Chinese from time immemorial by burning oil in lamps with insufficient air supply.

Carbon Black made from gas first in this country in 1864.

Ivory, Bone or Vine Blacks made from burning cuttings in closed retorts, grinding and refining the charred residue.

Lamp and Carbon Blacks are practically pure carbon; have a very low specific gravity; oil absorption and tinting strength very high; chiefly used for paints, enamels, lacquers, printing inks, and rubber.

Dry Colors first made by Sherwin-Williams Company at Cleveland in 1896. Moved to Chicago for much larger plant in 1903.

Prussian, Chinese or Iron Blue first discovered by Diesbach in Berlin in 1710. Sherwin-Williams first connection with dry colors through Lewis Berger & Sons, Ltd. who began manufacture of Prussian Blue in London in 1760. Prussian Blue is made

by a precipitating of a solution of soluble iron salt with a solution of potassium or sodium ferrocyanide and subsequent oxidation of the precipitate. The principle uses are for paints, enamels, lacquers, printing inks, and coated papers.

Solfast Blues are made both tungstated and nontungstated types. Has excellent tinting strength, brilliant color, permanence and fast to light. Non-tungstated recently introduced in England as Monastral Blue or Heliogen in Germany, is the most outstanding addition to color manufacture in the past century.

Alkali Blue used by printing manufacturers for toning up blacks and certain blue inks.

Victoria Blue tungstated blue dye; very brilliant and stable to alkali.

Violet-Permanent Methyl Violet precipitated dyestuff with phospho-tungstic acid; used for printing inks.

Ultramarine Blue first made by Christian Gusalin at Paris in 1828. Made by fusing together alumina, sodium sulphate, sodium carbonate, sulphide, coal, etc. Used in paints, enamels, lacquers, printing inks, coated papers, etc.

Chrome Yellows - first developed about 1800. Made by precipitating solution of lead salt with soluble lead chromate. Is very permanent and rust inhibitive. Chief use is for paint, enamels, lacquers, printing inks, paper coatings, and floor coverings.

Zinc Yellow is made by using zinc instead of a lead base. Very clean and sharp color. Chief use is for printing ink and metal primer for ships and airplanes.

Permansa Yellow made by coupling meta nitro para toluidine with aceto acetanilide. Superior to chrome or zinc yellows in permanence and three or four times its tinctorial strength, and very resistant to acid and alkali.

Chrome Green first made in France in 1858 by a combination of specially prepared Prussian Blues with Chrome Yellow. There are two general types; acetate made with acetic acid and nitrate made with nitric acid in the yellows that they contain. Chief use is for house paints, enamels, lacquers, printing inks, floor coverings, etc.

Chrome Oxide Greens are very permanent and used where most permanent green color is required.

Solfast Green Toners - basic dyestuff made with phospho-tungstic acid. Very brilliant in color with high tinctorial strength and good permanence.

Organic Reds - Use aniline dye, discovered by Sir William H. Perkin, who, in England in 1865, made a mauve dye used to dye silk for a dress for Queen Victoria. For this he was knighted. From this discovery has followed a very wide range of many colors made by most complicated chemical processes.

Para Reds are a precipitated solution of diazotized para nitraniline by beta naphthol. The light para is produced by coupling para nitraniline with beta naphthol. The dark is produced by replacing 10% of the beta naphthol with mono acid. These reds have good permanence to light and excellent covering power. Are used in moderate priced red enamels, etc., but the use is restricted in lacquers on account of the bleeding tendency.

Toluidine Red is produced by coupling meta nitro para toluidine with beta naphthol. It is lighter and brighter than para; very fas to light and opaque. Does not bleed in paint vehicles but bleeds badly in lacquer solvents. Used in the best grade enamels and printing inks requiring permanence and bright reds.

Graphic Red - Sherwin-Williams trade mark for Lithol Red - is the result of coupling Tobias acid and beta naphthol. Various shades are produced by forming different metallic salts. Color is bright and clean; fairly permanent. Non-bleeding in oil. Chief use is in printing inks and also valuable for enamels.

Lake Red C - color specially suitable for printing ink; clean and bright and fast to light; non-bleeding in oil and water.

Permanent Red is made by coupling ortho-chlor-para-nitraniline with beta naphthol. Has excellent fastness to light. Does not bleed in paint vehicles but does bleed in synthetic vehicles containing coal tar solvents.

Rubanox Reds or Lithol Rubine have excellent fastness to light and are very bright in color. Used chiefly for printing inks; also for paint and enamels requiring permanence and non-bleeding qualities.

Solfast Toners represent a new line of colors - brilliant, fast to light, and non-bleeding. Comprise two groups - The Solfast Reds and Pinks and Tungstated Rhodamine Reds.

Maroon Toners represent a group of CP organic pigments; non-bleeding, fairly resistant to light; beautiful rich tones suitable for lacquers, and paints and enamels.

Permanent Orange Toners represent orange organic colors made by coupling ortho nitraniline with beta naphthol. Very permanent in color; quite opaque, bleed slightly in water and oil.