



GOVERNMENT OF ANDHRA PRADESH COMMISSIONERATE OF COLLEGIATE EDUCATION



Oil paint Chemistry

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Introduction

- Oil paint is a type of slow drying paint that consists of particles of pigment suspended in a drying oil, commonly linseed, safflower or poppy oil. The viscosity of the paint can sometimes be modified by the addition of solvents or resins. The reason oil paint takes so long to dry is because when exposed to air, oils do not undergo the same evaporative process as water does. It polymerizes into a dry semi solid. This rate of process can be very slow depending on the oil. Due to slow drying of oil paint, the colour does not change for a long time.

Oil paint formulation

- Oil paints consist essentially of –
- (i) a base,
- (ii) a vehicle (always an oil, generally raw or boiled linseed oil),
- (iii) one or more colouring pigments,
- (iv) solvent or thinner,
- (v) a drier, and
- (vi) an inert filler.

i. Base:

- It provides body to the paint and on it depends the nature of paints to a great extent :
- (i) It is the solid matter forming the main body of the paint.
- (ii) It makes the paint film harder and more resistant to abrasion.
- (iii) It forms an opaque layer to obscure the surface of material to be painted.
- (iv) It reduces shrinkage cracks formed on drying.
- e.g. White lead, Red lead, Zinc oxide (or zinc white), Iron Oxide, and metallic powders such as Aluminum, Copper and Bronze etc.

ii. Vehicle

- (i) It is an oily liquid in which the base and pigment are soluble.
- (ii) It facilitates the paint to be conveniently spread evenly over the surface by means of a brush.
- (iii) It acts as a binder for the base and causes it to stick to the surface.
- (iv) On drying it forms a tough and a elastic film.
- e.g. Linseed oil(It is the most widely used vehicle for all ordinary painting works. It is used either raw or boiled.), Poppy oil, Nut oil and Tung oil.

iii. Colouring pigments.

- These are finely ground colouring matters. Their main function is to give colour and opacity to the paint. Pigments are liable to fade because of the bleaching action of sun rays. These are also subjected to change of colour under the influence of moisture, heat or hydrogen sulphide. Commonly used pigments are :
- Lamp black, vegetable black, ivory black (*Blacks*), Indigo, Prussian blue (*Blues*) etc...



iv. Solvent or thinner.

- A liquid thinner is added to the prepared paints to increase their fluidity to the desired consistency so as to make them work more smoothly and also to help penetration of porous surfaces.
- e.g. Oil of turpentine, linseed oil and Copal varnish

v. Drier.

- Driers are added to paints to quicken the drying of vehicles. Linseed oil dries by absorbing oxygen and it could be expedited by adding substances rich in oxygen and it could be expedited by adding substances rich in oxygen.
- e.g. Litharge, Red lead, lead acetate, Manganese dioxide and Zinc sulphate.

vi. Inert filler.

- It is an adulterant mixed to replace the base in part and thus reducing the cost of paint. e.g. silica, charcoal, powdered chalk, aluminium silicate and barium sulphate etc.

vii. Drying oil

- The various oils used as mediums in oil painting are known as drying oils
- The most common types of oil in oil paints are linseed oil, walnut oil, poppy seed oil, and safflower oil.

viii. Linseed Oil

- Linseed oil is made from the seeds of the flax plant. It adds gloss and transparency to paints and is available in several forms. It dries very thoroughly, making it ideal for underpainting and initial layers in a painting.

ix. Poppyseed Oil

- ▶ Poppy seed oil is very pale oil, more transparent and less likely to yellow than linseed oil, so it is often used for whites, pale colors, and blues.



■ **x. Safflower Oil**

■ Safflower oil has the same characteristics as poppyseed oil but dries a bit faster.

■ **xi. Sunflower oil**

■ Sunflower oil also has similar characteristics to poppy seed oil. It's made from sunflower seeds.



Questions

- 1. what are the ingredients to oil paints?
- 2. What is unique about oil paint?
- 3. What is the advantage of oil in painting