



PAINTS

Definition Paint is a viscous, opaque (not clear), mechanical dispersion mixture of one or more pigments (dye) in a vehicle (drying oil).

Requisites of a good paint: A good paint should the following properties, it should

- 1) It should have a high hiding power
- 2) It form a good and uniform film on the metal surface
- 3) The film should not crack on drying
- 4) Give a glossy film
- 5) The film produced should be washable

Constituents of paint:

**a) Pigment b) Vehicle or medium or drying oil c) Thinner d) Driers e) Fillers or Extenders
f) Plasticizers g) Antiskinning agents**

a) Pigment:

It is a solid substance which imparts colour to the paint. It is an essential constituent of a paint.

Its functions are to

- i) Give opacity(cloudiness) and colour to the film
- ii) Provide strength to the paint
- iii) Provide an aesthetical appeal
- iv) Give protection to the paint film by reflecting UV light.
- v) Increase weather resistance of the film
- vi) Provide resistance to paint film against abrasion.

Paints and the compounds required as follows:

White pigments	-	White lead, ZnO, BaSO ₄ , TiO ₂ , ZrO ₂
Blue pigments	-	Prussian blue, ultramarine blue
Black pigments	-	Graphite, carbon black, lamp black
Red pigments	-	Red lead, Fe ₃ O ₄ , carmine
Green pigments	-	Chromium oxide, chrome green

b) Vehicle or drying oil or medium:

Vehicle is a liquid substance and film forming material. It holds all the ingredients of paint in liquid suspension. Eg., linseed oil, tung oil.

Functions:

- i) To hold the pigment on the metal surface
- ii) To form the protective film by evaporation or by other means.
- iii) To impart water repellency, durability and toughness to the film



iv) To improve the adhesion of the film

c) Thinners

Thinners are volatile substances which evaporate easily after application of the paint. They are added to the paints for reducing the viscosity of the paints so that they can be easily applied to the metal surface. Eg., Dipentine, turpentine, toluol, xylo.

Functions:

- i) To reduce the viscosity of the paint
- ii) To dissolve vehicle and the additives in the vehicle
- iii) To suspend the pigments
- iv) To increase the penetration power of the vehicle
- v) To increase the elasticity of the paint film
- vi) To help the drying of the paint film.

d) Driers:

These are the substances used to accelerate the process of drying. They are oxygen carrier catalysts. Eg., Naphthenates, linoleates, borates, resonates and tungstates of heavy metals (Pb, Zn, Co, Mn).

Functions:

- i) To accelerate the drying of the oil film through oxidation, polymerization and condensation
- ii) To improve the drying quality of the oil film.

e) Extenders or Fillers:

These are the inert materials which improve the properties of the paint. Eg., Gypsum, chalk, silica, talc, clay, CaCO_3 , CaSO_4 .

Functions:

- i) To fill the voids (empty space or any curved area) in the film
- ii) To act as a carrier for the pigment color.
- iii) To reduce the cost of the paint
- iv) To increase the durability of the paint
- v) To reduce the cracking of dry paint
- vi) To increase random arrangement of pigment particles.

f) Plasticizers:

These are added to the paint to provide elasticity to the film and to minimize its crack.

Eg., Triphenyl phosphate, dibutyl tartarate, tributyl phthalate, tricresyl phosphate, diamyl phthalate.

g) Antiskinning agents:



These are sometimes added to some paints to prevent gelling and skinning of the finished product. Eg., Polyhydroxy phenols.