
PAINT

Definition

- Mechanical dispersion of one / more finely divided pigments in a medium
- (thinner + vehicle).
- When paint is applied on a metal surface, the thinner evaporates, while the vehicle forming a pigmented film

Characteristics of good Paints

- Spread easily on the metal surface.
- Adhere well to the metal surface.
- High hiding power.
- Not crack on drying.
- Stable colour.
- Have high corrosive resistance.
- High water repelling property.
- Give a glassy film.
- long life.
- High covering power.

Constituents and their functions of Paint

i) PIGMENTS

Solid and colour producing substances

Functions of Pigments

i) desired colour and opacity to the film.

ii) provides strength to the film.

iii) protects the film from the destructive uv-rays.

iv) improves weather-resistance to the film.

Examples:

- **White Pigments – White lead [2 $PbCO_3$, $Pb(OH)_2$] or ZnO.**
- **Lithophone (75 % $BaSO_4$ + 25 % ZnS)**
- **Red Pigments – Venetian red (Fe_2O_3 and $CaSO_4$)**
- **Indian red (Fe_2O_3)**
- **Blue Pigments – Prussian blue $Fe_4[Fe(CN)_6]_3$**
- **Green Pigments – Chromium oxide**
- **Black Pigments – Lamp black, carbon black**
- **Yellow – Chrome yellow, Zinc yellow**

Vehicle or Drying Oil

- Non-volatile portion of a medium.
- film forming constituent of the paint.
- higher molecular weight fatty acids present in vegetable & animal oils.

Functions

•They form a protective film by the oxidation and polymerisation of oil.

•They bind the pigment particles together on the metal surface.

•They impart water repelling property, toughness and durability to the film.

Examples:

Linseed oil, dehydrated castor oil, soyabean oil, etc.

Thinners or Solvents

highly volatile portion of a medium which evaporates after the application of the paints.

Functions

i) reduces the viscosity of the paint.

ii) dissolves oil, pigments, produces a homogeneous mixture.

iii) increases the penetrating power of the vehicles.

iv) increases the elasticity of the paint film.

v) helps the drying process of the paint.

Examples: Turpentine, benzene, dipentene, naphtha, kerosene, etc.

Extenders or Fillers

inert white or colourless & low refractive indices pigment materials.

Functions

i) Reduces the cost of the paints.

ii) Retards the settling of the pigments.

iii) Modifies the shades of pigments.

iv) Reduces the cracking of dry paint film.

v) Increases the durability of the paint.

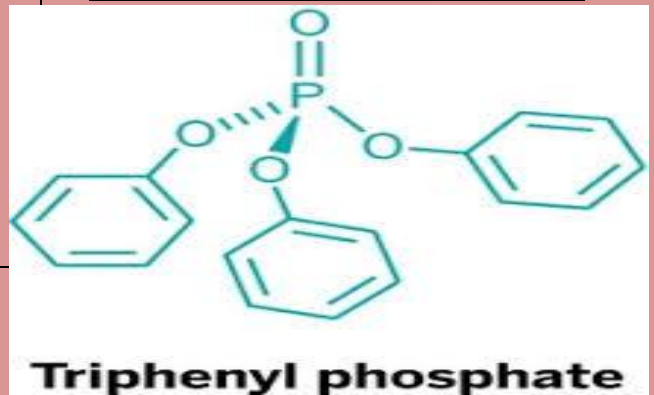
Examples: Talc, gypsum, china clay, $CaCO_3$, ground silica, magnesium silicate, etc.

5.Driers used to increase the rate of drying process (oxygen carriers).

Examples: Metallic soaps like Naphthenates, linoleates, resinate borates and tungstates of cobalt, Zn, Mn and Pb.

vi) Plasticizers: They are added to provide elasticity to the film and to prevent cracking of film.

Examples: Triphenyl phosphate, tributyl phthalate, tricresyl phosphate, dibutyl tartarate, etc.



7. Anti-skinning Agents

They are added to prevent gelling and skinning of the paints.

Example: Polyhydroxy phenol.