

BUILDING MATERIAL & CONCRETE TECHNOLOGY

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* PROPERTIES OF ENGINEERING MATERIALS

⇒ Chemical properties of Building Materials

- (i) Chemical composition
- (ii) Acidity
- (iii) Alkalinity
- (iv) Corrosion resistance
- (v) Solubility

⇒ Chemical composition: The chemical composition of engineering material indicates the elements which are combined together to form that material. Chemical composition of a material affects the properties of engineering materials very much. The strength, hardness, ductility, brittleness, corrosion resistance, weldability etc. depends on chemical composition of materials.

⇒ CORROSION RESISTANCE:

Corrosion is a gradual chemical or electrochemical attack on a metal by its surrounding medium. Due to the corrosion metal starts getting converted into an oxide, salt or some other compound. Corrosion of a metals

is effected by many factors such as air, industrial atmosphere, acids, bases, salt solutions and soils etc. Corrosion has a very adverse effect on materials. Due to corrosion the strength & life of a material is reduced.

Corrosion resistance of a material:

→ is the ability of material to resist the oxidation in atmospheric condition. Generally pure metals such as iron, copper, aluminium etc gets corroded slowly in atmosphere. To avoid the corrosion of these metal in pure form, we use these metals in the form of alloys such as stainless steel, brass, bronze, german silver, gunmetal etc.

⇒ Engineering Properties of Building Materials:

- (i) Shock resistance
- (ii) Humidity
- (iii) Hygroscopicity
- (iv) Thermal conductivity
- (v) Heat capacity
- (vi) Fire Resistance

⇒ Hygroscopicity: the ability of material to absorb vapor from

air. There are a large number of building materials that can absorb a significant amount of water vapour. Such materials include: wood, foam concrete, thermal insulation materials, etc. Building materials with increased hygroscopicity when completely saturated with water lose their properties, & also change geometric dimensions. To protect building materials from saturation with water vapour, water repellent protective compounds are used.

⇒ Shock Resistance:

Impact Resistance -

The ability of a material to withstand fracture under impact loads. Brittle materials poorly resist shock loads.

Strength is the ability of a material to resist internal stresses resulting from external forces (loads).

Under the action of external forces, the material is deformed. Deformations can be elastic if they disappear after unloading, and residual if they remain after unloading.