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## 1 # Material of Pharmaceutical Plant Construction.

⇒ Common building material used for process plant include Carbon steel, stainless steel, steel alloys, graphite, glass, titanium, plastic, Monel, and many more. For this discussion let's focus on material of construction that are used for highly corrosive and abrasive media.

The selection of a material for the construction of equipment depends on the following classification of corrosion according to the environment.

## # Prevent of Corrosion ⇒ Protective Coatings

The application of a paint coating is a cost-effective way of preventing corrosion. Paint coating act as a barrier to prevent the transfer of electrochemical charge from the corrosive solution to the metal underneath. In this process, a dry powder is applied to the clean metal surface. While all metals corrode it is estimated that 25-30% of corrosion could be prevented using suitable protection method.

one simple way to prevent corrosion is to use a corrosion resistant metal such as aluminum or stainless steel.

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To prevent corrosion, the material selection has to take into account the groundwater composition. The main aspect that influences the virtually all situations, metal corrosion can be managed. Slowed numerous ways to slow or prevent it.

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② Factor affecting during material selected for Pharmaceutical

⇒ A number of equipment are used in the manufacture of Pharmaceutical, bulk drugs, antibiotic biological product etc.

• In addition, several accessories such as Containers for processing and packing of finished product are essential

• A wide variety of material can be utilized for the construction of equipment

• In the plant improvement is depend on → (1) Design of equipment

(2) Selection of material (3) Technique of fabrication

# Physial Factors ⇒

- (1) Strength
- (2) wear properties
- (3) Sterilisation
- (4) Cleaning
- (5) Mass
- (6) Thermal Conductivity

## # Factors Influencing the Selection of material ⇒ Non-Metal \* ⇒

(1) Rubber

(2) Plastic

(3) other is

- wood Timber

- Carbon Graphite

- Silica ware.

### (i) Chemical factor ⇒

(a) Construction of the product

(b) Constructive of material Construction

### ③ Theory of Corrosion ⇒

This type of Corrosion occurs when the metal comes in contact with a conducting liquid or when two dissimilar metals are immersed or dipped partly in a solution. There is the formation of a galvanic cell on the surface of metal. Parts of the cell act as anode and rest act as cathode. The chemical in the environment and humidity act as an electrolyte. Oxidation of anodic part takes place and it results in Corrosion at anode, while reduction takes place at cathode. The Corrosion product is formed on the surface of the metal between anode and cathode.

### # Different theories of Corrosion are :-

- (1) Acid theory
- (2) Direct chemical attack or dry Corrosion theory
- (3) Electrochemical or wet Corrosion theory

## ② Type of Corrosion ⇒

### ⇒ Dry or Chemical Corrosion ⇒

It is due to the direct chemical action of environmental atmosphere gases such as  $O_2$ ,  $H_2S$ ,  $SO_2$ ,  $N_2$  halogenes or anhydrous inorganic liquid with metal surface.

### ⇒ Wet or Electrochemical Corrosion ⇒

⇒ It is due to the existence of separate "anodic" and "cathodic" areas in the system between which current flow through the conducting liquid and the anode gets oxidized and wasted.

## # Prevent of Corrosion ⇒

- One of the easiest and cheapest ways to prevent corrosion is to use barrier coatings like Paint Plastic or Powder
- Powder, including epoxy nylon and urethane, are heated to the metal surface to create a thin film

## ④ Ferrous and Non-Ferrous metal ⇒

⇒ The simple answer is that ferrous metal contain ~~iron~~<sup>iron</sup>, and Non-Ferrous metal don't. That means each type of ferrous and non-Ferrous metal has different qualities and uses. Ferrous<sup>फेरस</sup> metal contain iron, and are known for their Strength. Think steel Stainless steel, Carbon steel, Cast iron<sup>अष्टम लोहा</sup>. Some ferrous metal are - vehicle scrap metal demolition site<sup>लोहे के टुकड़े</sup> Scrap metal, metal off cut from manufacturing industries.

Some non-ferrous metals are aluminum and alloys, copper, brass, lead, zinc stainless steel electronic cable etc.



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# Inorganic Non-Metal, basic of material handling sy

# Inorganic made of oxides, Carbides, Nitrides, halogen Compound, Silicate aluminate, Phosphate, borates and other substances on the other hand, is the

opposite. It is the study of the formation Synthesis, and properties of compound that do not contain carbon-hydrogen bonds.

The 17 non metal element are: hydrogen helium, Carbon, Nitrogen, oxygen, fluorine neon, Phosphorus, Sulfur, chlorine, xenon and radon. Radeon.

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# Handling System material ⇒

→ In early system of handling material, goods were handled as single unit in a discontinuous manner. These early method treated the three basic stage of handling material Collection, manufacturing, and Product distribution - as discrete step, and material were moved in individual rather than bulk units.

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## # Types of Material Handling equipment.

- Material handling equipment is any tool used to aid in the movement, protection, storage, and control of material and product.
- Storage and Handling Equipment.
- Example of Storage and handling equipment
- Industrial Truck
- Bulk material Handling Equipment.

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