

## Geofabrics.

Geofabrics are also called geosynthesis or geotextiles. These are synthetic fabrics which are sufficiently durable to last a good length of time in soil environment used in geotechnical engineering. Some geofabrics are polyester, nylon, polyethylene and geotechnical engineering. The fabric may be woven, knitted or punched. They are used for the following functions:

1. Drainage paths for water for soil consolidation
2. Separation of different types of soil materials
3. Soil reinforcement in reinforced earth construction
4. Filtration of water from soil.

## Uses

1. As drainage paths to assist consolidation. Geotextiles are used as drainage wicks to assist drainage and consolidation of clayey deposits. The modern readymade —plastic geotextile drainl consists of a plastic drain core and a geotextile jacket covering the plastic core pipe. They are efficient for soil drainage to assist in preloading of foundations.
2. As a separation medium. It is used as under railway track, to separate the ballast from sub grade, thus decreasing penetration of ballast into the weak sub grade.
3. As soil reinforcement. These reinforcements are used in the reinforced earth techniques for the following purposes
  - i) For retaining walls and stability of slopes
  - ii) For improving the bearing capacity of foundations.
4. As a filtration medium for drainage. In many situations, when used for drainage and separation, it also acts as a filter.

## Classification

1. **Geotextiles:** These materials consist of either woven or non-woven fabrics and are generally used for separation, drainage, filtration and reinforcement. From strength considerations, the strongest of these are woven fabrics, then the resin bonded, melt bonded and finally the needle punched fabrics.
2. **Geogrids:** They have large openings and are made of materials with high tensile strength, low elongation and dimensional stability. They are made from plain polymer sheets by punching holes in it followed by 2 stretching operations so that a grid is formed. They can be designed to have different strength or same strength in two

directions. They are mainly used for soil reinforcement or for separation of materials or for improving bearing capacity of soil.

**3.Geomembranes:** These materials are available in wide range of permeability. Continuous geomembrane barriers of sufficiently low permeability can be used to control fluid migration in geotechnical engineering while those of high permeability are used for drainage.

**4.Linear strips for soil reinforcement:** Polymer fibres are made into strips which can be used for reinforced earth in retaining walls. Glass-reinforced plastics are also considered as suitable for soil reinforcement.

### **Use in Embankments**

As the embankments for flyovers in cities should occupy as little width as possible, the use of geotextiles as soil reinforcement for these embankments comes in very handy. Much steeper slopes than normally admissible with earth only can be provided by using soil reinforcement in the embankment. Similarly, consolidation of foundations of many new railway embankments for Indian Railways has been carried out by using plastic geotextile drains instead of old fashioned sand or wick drains.

### **Glass and its properties.**

Silica is the main constituent of glass. But it is to be added with sodium potassium carbonate to bring down melting point. To make it durable lime or lead oxide is also added. Manganese oxide is added to nullify the adverse effects of unwanted iron present in the impure silica. The raw materials are ground and sieved. They are mixed in specific proportion and melted in furnace. Then glass items are manufactured by blowing, flat drawing, rolling and pressing.

#### **Important Properties of Glass:**

1. It absorbs, refracts or transmits light. It can be made transparent or translucent.
2. It can take excellent polish.
3. It is an excellent electrical insulator.
4. It is strong and brittle.
5. It can be blown, drawn or pressed.
6. It is not affected by atmosphere.
7. It has excellent resistance to chemicals.
8. It is available in various beautiful colours.

9. With the advancement in technology, it is possible to make glass lighter than cork or stronger than steel.
10. Glass panes can be cleaned easily.

## **Types of Glass**

The glass may be broadly classified as:

1. **Soda Lime Glass:** It is mainly a mixture of sodium silicate and calcium silicate. It is fusible at low temperature. In the fusion condition it can be blown or welded easily. It is colourless. It is used as window panes and for the laboratory tubes and apparatus.
2. **Potash Lime Glass:** It is mainly a mixture of potassium silicate and calcium silicate. It is also known as hard glass. It fuses at high temperature. It is used in the manufacture of glass articles which have to withstand high temperatures.
3. **Potash Lead Glass:** It is mainly a mixture of potassium silicate and lead silicate. It possesses bright lustre and great refractive power. It is used in the manufacture of artificial gems, electric bulbs, lenses, prisms etc.
4. **Common Glass:** It is mainly a mixture of sodium silicate, calcium silicate and iron silicate. It is brown, green or yellow in colour. It is mainly used in the manufacture of medicine bottles.
5. **Special Glasses:** Properties of glasses can be suitably altered by changing basic ingredients and adding few more ingredients. It has now emerged as versatile material to

