

# Bitumen

Bitumen is a sticky, black, highly viscous liquid or semi-solid petroleum. It may be found in natural deposits or may be a refined product and is called a pitch. Bitumen can exist in a liquid phase or semi-solid phase. It is also a viscous type of material having a sufficient amount of viscosity.

**Bitumen Definition:** Bitumen is a blackish-brown petroleum substance. Bitumen is the composition of petroleum products and asphaltene resin. The natural origination of bitumen occurred a million years ago when living organisms were buried under rocks in swamps and other aquatic habitats. But nowadays, crude oil is the main source of the generation of bitumen.

## Meaning of Bitumen

Bitumen is a black substance made from crude oil and other petroleum products and can be used for manufacturing and covering roads and roof surfaces. Bitumen is one of the ingredients in the construction of flexible pavements.

Bitumen is similar to tar and charcoal material but has many differences, including its compositions. For the construction of road pavements, other materials are also used along with bitumen ingredients.

## Properties of Bitumen

The properties of the bitumen will depend on the various parameters. It varies according to the manufacturing process, ingredients used, and types of bitumens. Here a few properties of the bitumen are listed below.

- It is a hydrocarbon that is manufactured from the fractional distillation of petroleum.
- It is soluble in  $\text{CS}_2$  and  $\text{CCl}_4$ .
- It is more resistant to water.
- It has less temperature susceptibility.
- Less free carbon content.

## Uses of Bitumen

The uses of Bitumen depend on the ingredients used to manufacture bitumen. The use of bitumen also depends on the properties of the bitumen because different properties of a material are required for the different use of the material.

### Bitumen is Used for

Here a few uses of bitumen are listed below, which helps understand its different properties.

- Bitumens are used for the construction of roads.
- It can be used as a roofing material.
- Bitumens are water-resistant materials that can be used for waterproofing purposes.

## Tests on Bitumen

A different test on bitumen is carried out to know the different properties of bitumen. These properties are required because it governs the overall strength of bitumen. Some of these tests are carried out in the laboratory, and others can be carried out at the construction site. These tests should be done before using bitumen so that the correct measure of strength has been done. Here some of these tests on bitumen are listed below.

- Ductility test
- Softening point test for bitumen
- Penetration test
- Viscosity measurement test
- Flash and fire test
- Specific gravity measurement test
- Water content measurement
- Float test

## Types of Bitumen

Types of bitumen depend on various parameters like constituents, uses, viscosity, etc. Here few types of bitumen are given below that are used for the construction of flexible pavements.

- **Paving Grade Bitumen** is obtained from the distillation process of petroleum crude extensively used in surface and binder courses. At normal temperatures, bitumen is semi-solid, highly viscous, and sticky. On heating, it softens rapidly and attains fluid consistency, and viscosity decreases with a further increase in temperature.
- **Cut-Back Bitumen** is prepared by diluting a paving-grade bitumen with a volatile solvent such as light fuel oil or kerosene. It achieves fluid consistency at a relatively lower temperature.
- **Bitumen Emulsion** is prepared by dispersing bitumen in fine globules suspended in water with the help of a suitable emulsifier.