Rubber

Rubber is a natural polymer of Isoprene (usually cis-1,4-polyisoprene). It is hydrocarbon polymer occurring as milky latex in the sap of various plants and can also be made synthetically. A small percentage (about 5%) of other materials like proteins, fatty acids, resins and inorganic materials (salts) are also present in natural rubber. Rubber, as mentioned earlier too, can also be made artificially or synthetically. The type of rubber which is produced artificially is called synthetic rubber.

Different Types of Rubber

There are basically two broad categories into which the rubber types can be placed. These are- Natural Rubber and Synthetic Rubber.

Natural Rubber

The elastic material which is obtained from the latex sap of trees is called natural rubber. Natural rubber can be vulcanized and finished into a various types of rubber products. Various types of tropical and sub-tropical trees in the regions of Amazon, South East Asia and Africa produce the milky fluid latex that are in the form of latex tubes. The rubber molecules present in these latex tubes are made up of 5 carbon and 8 hydrogen atoms. A large number of these rubber molecules are joined with each other to form long, chain-like structure. This chain of rubber molecules is called polymers that gives rubber its property of elasticity.

Synthetic Rubber

Any kind of artificial elastomer (a polymer) is called synthetic rubber. An elastomer can be defined as a material having the property of elasticity. Thus, the type of rubber made from chemicals to act as the substitute for natural rubber is the synthetic rubber. There are various types of polymers used for making synthetic rubber types. Due to this, different types of synthetic rubbers have different properties that are tailored for specific needs of rubber products industries.

Destructive Testing

•In destructive testing, tests are carried out to the specimen's failure, in order to understand a specimen's performance or material behavior under different loads.

•The destructive testing method is used to find mechanical properties of materials such as tensile strength, yield strength, hardness, impact toughness, elongation, etc.

•Destructive testing is undertaken in order to understand a specimen's performance or material behaviour, these procedures are carried out to the test specimen's failure. Destructive testing procedures can either follow specific standards or can be tailored to reproduce set service conditions.

Tension Test

Tension test, also known as tensile test, is associated with the mechanical test of metal products subjected to a restrained load enough to bring to the rupture.

•Yield Strength

•Tensile Strength

•Elongation

•Reduction of Area

Hardness Test

Hardness is the resistance of a material to surface penetration. The indenter used varies with the test selected, but is generally hardened steel or diamond. Common hardness tests include the rockwell and brinell.

Flexural test

In the bending flexural test, a specimen is loaded under uniaxial bending stress (tension and compression) in order to obtain information on the bending behavior of materials.

In a flexural test, a standardized specimen is bent under uniaxial bending stress until plastic deformation or fracture occurs in order to obtain information about the flexural behaviour of materials.

The material is not subjected to tensile or compressive stress in the neutral axis and therefore remains unstressed there.

The tensile and compressive stresses increase linearly starting from the neutral axis up to the surface of the material and become maximum there. These maximum stresses are decisive for the loading of the material and are called bending stresses.

For the determination of the strength of brittle materials, the flexural test is usually more suitable than the tensile test

Nondestructive Testing (NDT)

•Also known as nondestructive examination (NDE) involves inspection and analysis of machinery or components without affecting the operation or the properties of the subject.

•It is wide group of analysis techniques used in science and technology industry to evaluate the properties of material, component or system without causing damage.

•NDT is used in variety of setting that covers wide range of industrial activity with new methods and applications being developed.

•Non destructive testing methods are routinely in industries where a failure of a cause significant hazard or transportation , piping, and hoisting equipment.

•Commonly used NDT techniques

- •Visual Inspection
- •Radiography
- •Dye penetrate
- •Ultrasonic testing
- •Magnetic Particle
- •Eddy Current
- •Acoustic emission