



Factors Affecting Elastic Modulus and Tensile Strength

Modulus of elasticity:

- Elastic constants are those constants that control how much the material will deform in response to a specific stress system.
- Theoretically, engineering strain is determined using elastic constants.
- They are utilized to establish a connection between engineering strain and stress. Four elastic constants make up a homogenous, isotropic material.

Elastic Constants:

- There are mainly 3 types of elastic constants,
 - Young's modulus or elastic modulus (E).
 - Shear modulus or stiffness modulus (G).
 - Modulus of bulk (K).

Factors affecting Modulus of elasticity:

- Change of length, i.e , Δl , as strain is the ratio of change of length to initial length of wire.
- Elongation: it is inversely proportional to Young's modulus.
- Effect of temperature: In general as the temperature increases the elastic property of a material decreases.
- Effect of impurities: Addition of impurity to metal may increase or decrease the elasticity. If the impurity has more elasticity than the material to which it is added, it increases the elasticity. If the impurity is less elastic than the material it decreases the elasticity.
- Nature of the material.
- As temperature increases, elasticity decreases.
- The elasticity of metal might change depending on the impurity added. If the impurity has greater elasticity, the elasticity of the material is increased. If the impurity is less elastic, the elasticity is reduced.
- The crystal structure of the object.

Tensile strength:

- Tensile strength is the maximum load that a material can support without fracture when being stretched, divided by the original cross-sectional area of the material.
- Tensile strengths have dimensions of force per unit area.
- It measures the strength of the materials.