FactorsAffectingElasticModulusandTensileStrength

Modulusofelasticity:

- Elasticconstantsarethoseconstantsthatcontrolhowmuchthematerialwilldeformin response to a specific stress system.
- Theoretically,engineeringstrainisdeterminedusingelasticconstants.
- Theyareutilizedtoestablishaconnectionbetweenengineeringstrainandstress.Four elastic constants make up a homogenous, isotropic material.

ElasticConstants:

- Therearemainly3typesofelasticconstants,
  - Young'smodulusorelasticmodulus(E).
  - Shearmodulusorstiffnessmodulus (G).
  - Modulusofbulk(K).

FactorsaffectingModulusofelasticity:

- Changeoflength,i.e,Δl,asstrainistheratioofchangeoflengthtoinitiallengthof wire.
- Elongation:itisinverselyproportionaltoYoung'smodulus.
- Effectoftemperature:Ingeneralasthetemperatureincreasestheelasticpropertyofa 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 increasestheelasticity.Iftheimpurityislesselasticthanthematerialitdecreasesthe elasticity.
- Natureofthematerial.
- Astemperatureincreases,elasticity decreases.
- Theelasticityofmetalmightchangedependingontheimpurityadded.Iftheimpurity has greater elasticity, the elasticity of the material is increased. If the impurity is less elastic, the elasticity is reduced.
- Thecrystalstructureoftheobject.

Tensilestrength:

- Tensilestrengthisthemaximumloadthatamaterialcansupportwithoutfracturewhen being stretched, divided by the original cross-sectional area of the material.
- Tensilestrengthshavedimensionsofforceperunitarea.
- Itmeasuresthestrengthofthe materials.