

Elasticity in Physics

Elasticity is object's property that causes it to be restored to its original shape after distortion. Object is considered more elastic, if it restores back to the original configuration in a much better form.

For example, a rubber band is easy to stretch, and get backs to near its original length when released, but its elasticity is less than that of a piano wire, which is harder to stretch, but would be more elastic than the rubber band as precision of its return to its original length.

Piano string can be struck numerous times without stretching enough to go noticeably out of tune. Perfect example for elastic material will be a spring, which when stretched, exerts a restoring force that brings it back to its original length.

This restoring force is directly proportional to the amount of stretch, as per Hooke's Law. For wires or columns, the elasticity is amount of deformation (strain) resulting from a given stress (Young's modulus). Bulk elastic properties express response of the materials to changes in pressure.

What is Hooke's Law?

It takes about twice as much force to stretch a spring twice as far and the linear dependence of displacement upon stretching force is called Hooke's law.

Types of Objects

Rigid Objects

If no deformation occurs whatsoever, then the object is called a Rigid Object.

Elastic Objects

Deformation does occur, but it disappears if the balanced external forces are removed.

Plastic Objects

Here, deformation does occur, and it remains permanent even if the balanced external forces are removed.