

- Toughness is the ability to absorb energy up to fracture (energy per unit volume of material) and can be measured by area under the stress Vs Strain graph.
- ✤ A "tough" material has strength and ductility.



## Hardness

- Measure material's resistance to localized plastic deformation (a genali dent or scratch).
- Quantitative hardness techniques where a small indenter is forced into the surface of a material.
- The depth or size of the indentation is measured, and corresponds to a hardness number.
- The softer the material, the larger and deeper the indentation (and lower hardness number).