



Mechanical Testing



Engineering Materials and Metallurgy

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Mechanical Testing



Testing Types



- **Mechanical tests** – the material may be **physically tested to destruction**. Will normally specify a value for properties such as strength, hardness, toughness, etc.
- **Non-destructive tests (NDT)** – samples or finished articles are tested before being used **and can be reused after testing**.

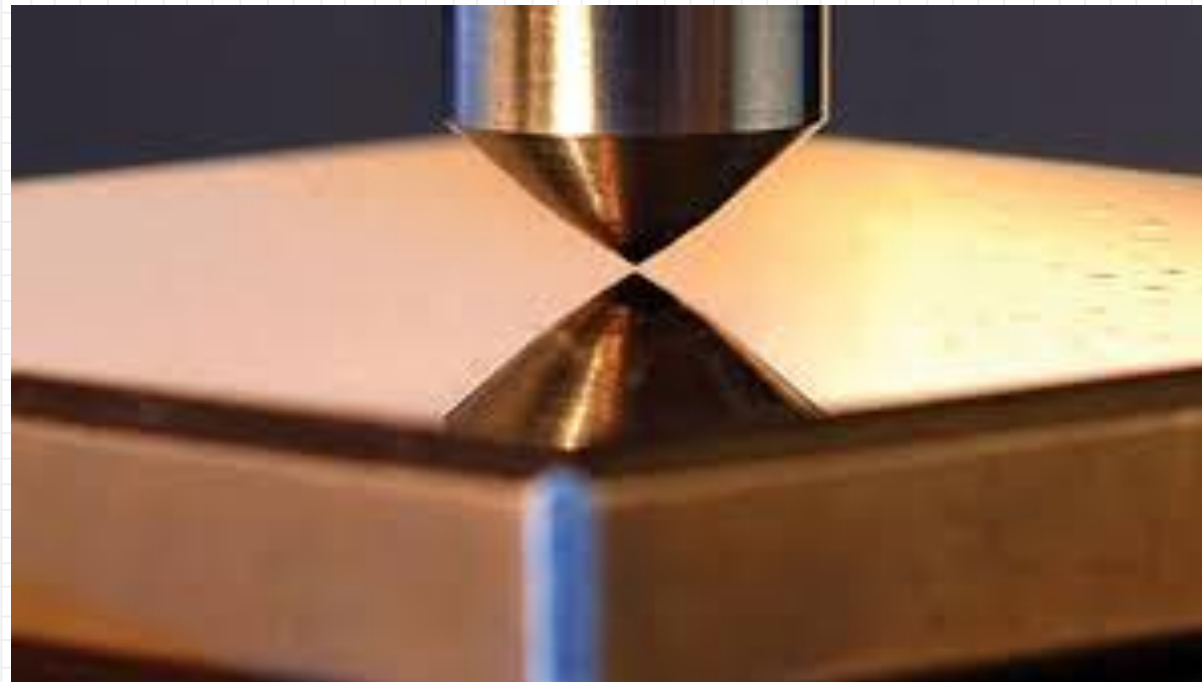




Hardness Testing



Hardness is the ability to withstand **indentation or scratches**





Brinell Hardness Test



- Uses ball shaped indenter.
- Cannot be used for **thin materials**.
- Ball may deform on very hard materials
- Surface area of indentation is measured.



Hardened steel
or tungsten
carbide ball



Diameter =
10 mm or
5 mm or
1 mm

Brinell Hardness Test



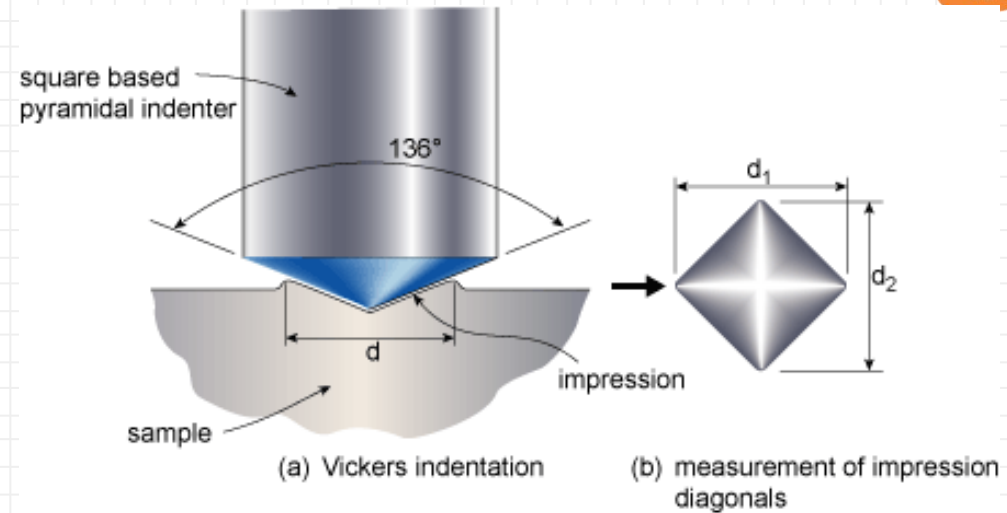
Brinell Hardness Test



Vickers Hardness Test



- Uses square shaped pyramid indenter
- Accurate results
- Measures length of diagonal on indentation.
- Usually used on very hard materials



Vickers Hardness Test



Vickers
Hardness Test



Rockwell Hardness Tests



- Gives direct reading.
- Rockwell B (ball) used for **soft materials**.
- Rockwell C (cone) uses diamond cone for **hard materials**.
- Flexible, quick and easy to use.

Two most common indenters are
Ball – B and
Cone – C





Rockwell Hardness Tests



Rockwell Hardness Test

Scale C



Thank You

[Assessment](#) - Cross Word Puzzle