HARDNESS TESTING OF MATERIALS

Elizabeth Merten
University of Washington, Seattle
Department of Materials Science & Engineering
Hardness is measurement of a material’s ability to withstand permanent deformation under an applied (known) force.

It’s important to have standardized techniques in measuring a material’s hardness in order to obtain accurate measurements for comparison.

Three typical hardness testers
- Brinell
- Rockwell
- Vickers
1. Carefully center sample onto the platform*
2. Slowly adjust the machine so that the indenter is in contact with the sample
3. Apply the load by using the trip lever
4. Record measurement on dial indicator
5. Be sure to take three hardness measurements on different locations on the sample and calculate the average
6. Remove the load and the sample
7. Rotate samples among groups and compare measurement values

*Samples should be no less than ¼ inch in thickness for accurate measurements. (If the sample is too thin the indenter could penetrate through the sample possibly damaging the machine)
Vickers hardness testing on a brass sample*

Hardness values are obtained through the size and shape of the indentation
And varies from each method
Discussion & Questions

- What if any differences in measurements were noted and what are the possible reasons they differed from one another?

- Why is it important to have a standard way of measuring these samples?

- Were the measurements what you expected to be? Why or Why not?