

ME111
 Instructor: Peter Pinsky
 Class #4
 October 4, 2000

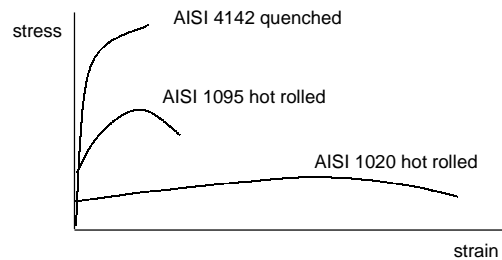
Today's Topics

- Properties of engineering materials beyond the elastic limit
- The uniaxial tension test

Reading Assignment Jvinal, Chapter 3

Problem Set #2 Due 10/11/00 in class

Problem 1



Which of the steel alloys shown would you choose to obtain maximum:

- Strength
- Modulus of resilience
- Toughness
- Stiffness

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Problem 2

A metal has an ultimate strength of 60 kpsi at its elastic limit and the strain at that point is 0.002. What is its modulus of elasticity? What is the strain energy at the elastic limit?

Problem 3

A material has a yield strength of 100 kpsi at an offset of 0.6% strain. What is its modulus of resilience?

Problem 4

A steel has a yield strength of 414 MPa, an ultimate tensile strength of 689 MPa, and an elongation at fracture of 15%. Is it a ductile material? What is its approximate modulus of toughness? What is its approximate modulus of resilience?

Problem 5

The Brinnell hardness of a steel specimen was measured to be 340 HB. What is the material's approximate tensile strength?

Problem 6

Jvinal 3.11

Problem 7

Jvinal 3.17

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