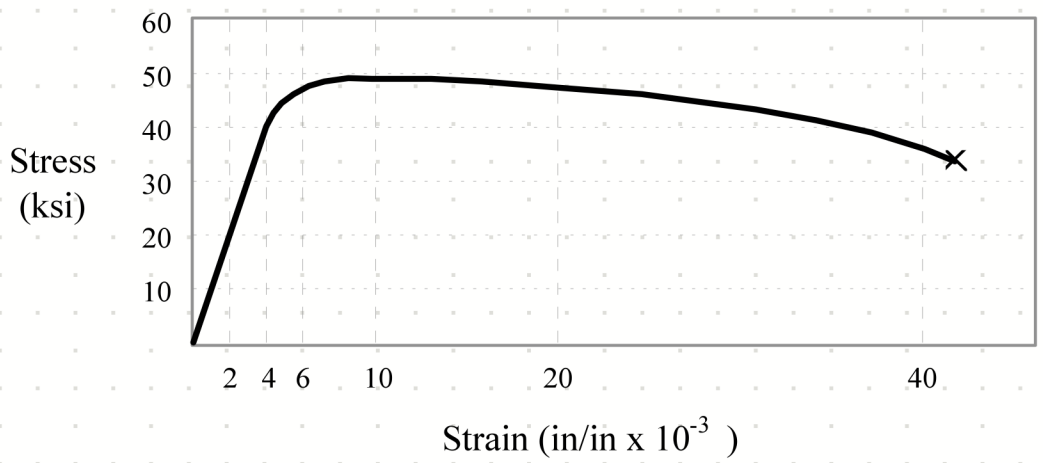
Worksheet #5A
Stress-Strain Curves



1. Using the stress-strain curve above, determine:

   A. The proportional limit stress.

   B. The yield stress (0.2% offset).

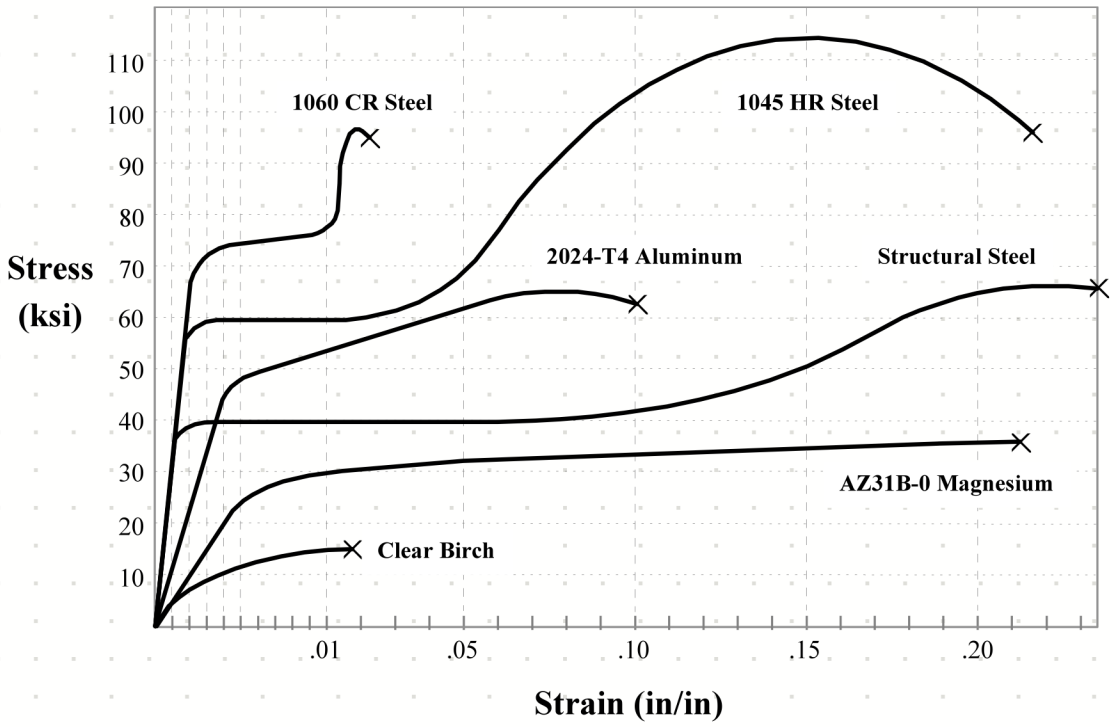
   C. The ultimate strength.

   D. The rupture stress.

   E. The Modulus of Elasticity.

2. During a tension test on a 1/2" diameter specimen (2" gage length), you record the force = 3000 lbs, the axial deformation = 30.5 x 10^{-4} inches, and the diameter is now 0.4998 inches. What is Poisson's Ratio for this material?

Worksheet #5B
Material Properties



Using the stress-strain curves above, determine:

A. Young's modulus for 1060 CR Steel.

B. The ultimate strength of 1045 HR Steel.

C. The proportional limit of 2024-T4 Aluminum.

D. The yield point of Structural Steel.

E. The yield stress (based on 0.2% permanent offset) for 2024-T4 Aluminum.

F. Which of these materials is the strongest? Why?

1060 CR Steel 2024-T4 Aluminum AZ31B-O Magnesium

G. Which of these is the most ductile material? Why?

Structural Steel 1045 HR Steel AZ31B-O Magnesium

H. Which of these is the most brittle material? Why?

2024-T4 Aluminum 1060 CR Steel 1045 HR Steel

I. Which of these materials is the most resilient? Why?

1060 CR Steel 1045 HR Steel Structural Steel

J. Which of these is the toughest material? Why?

Structural Steel 1060 CR Steel 1045 HR Steel

K. Which material is the stiffest? Why?

1060 CR Steel 2024-T4 Aluminum Clear Birch