



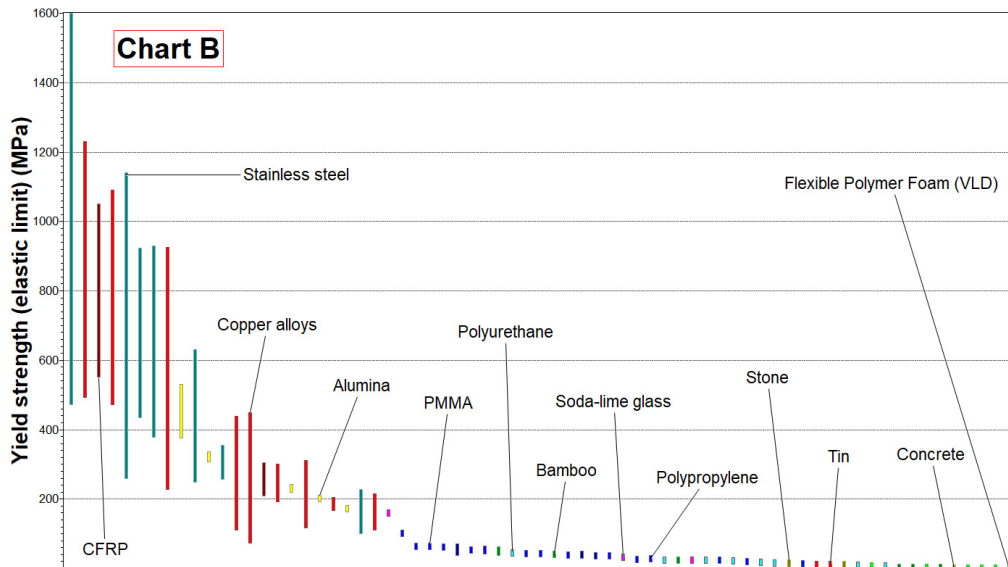
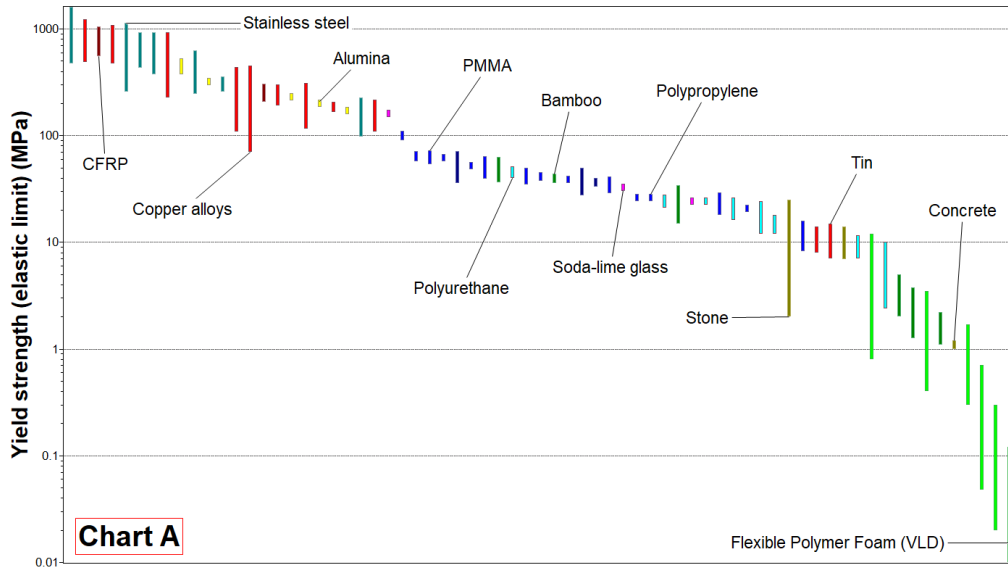
Materials Selection with Ashby Charts

Homework Assignment

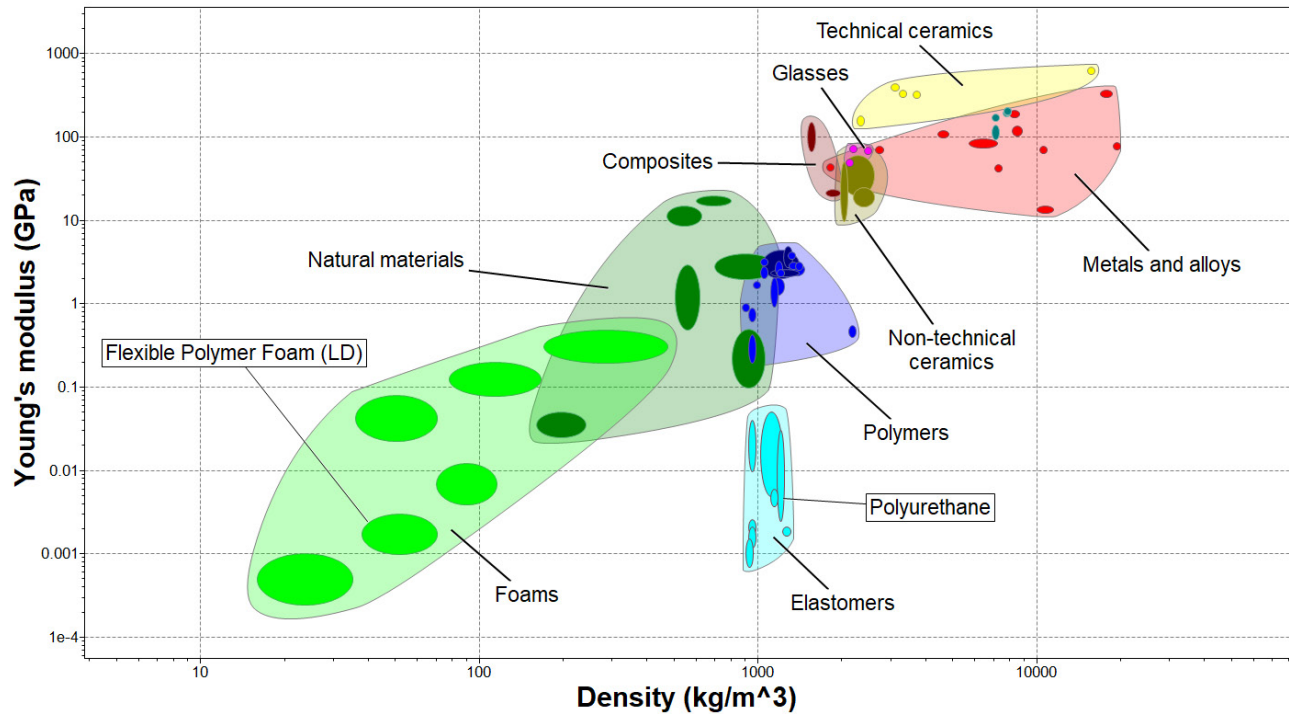
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Section 1: Reading Property Charts

1. Take a look at the two property bar charts below. What is the difference between them? Is one easier to read? Why or why not?



Use the Young's Modulus vs. Density chart below for Problems 2 and 3.



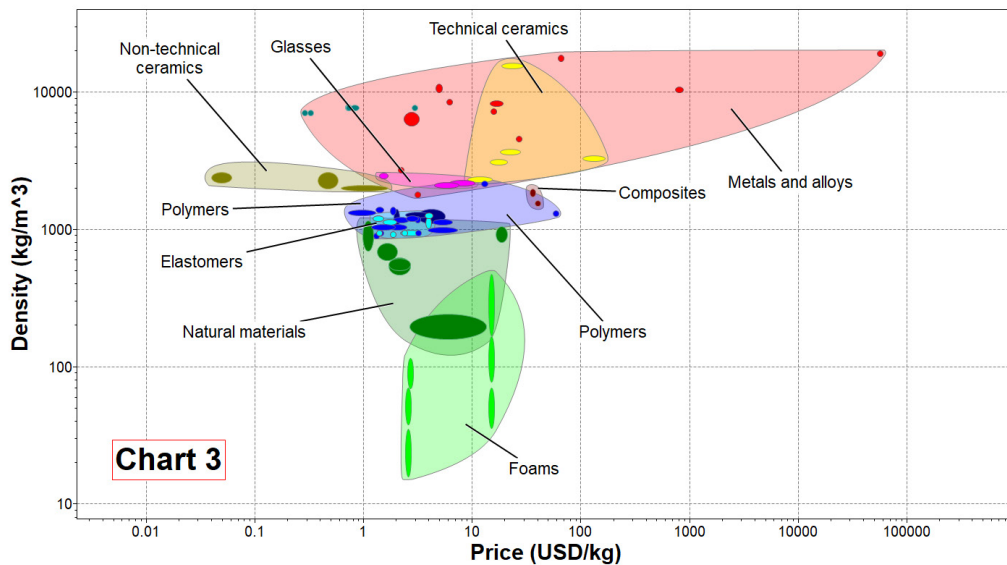
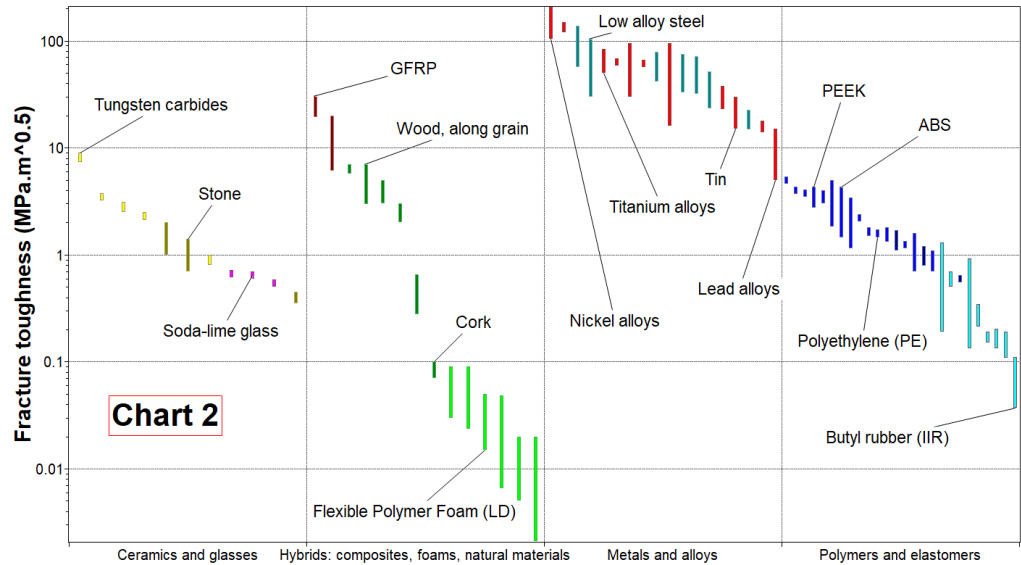
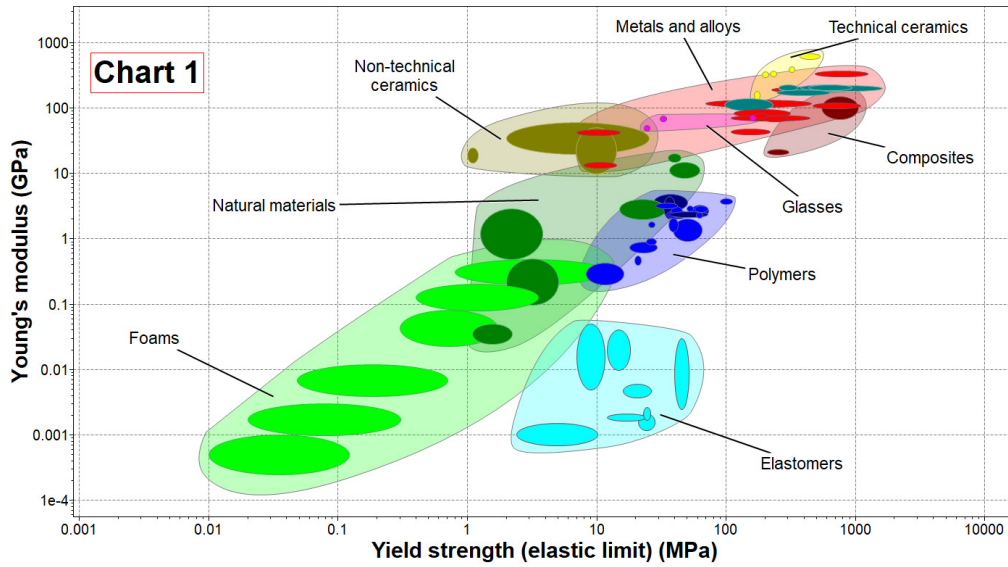
2. Why are ceramics and metals in the upper right quadrant of this chart?

(Think of the atomic structure of ceramics and metals compared to say polymers. Additional information can be found in the [Intro to Materials Structures AIC](#) here)

3. Two materials are highlighted on this chart- a Flexible Polymer Foam and Polyurethane. Why is the flexible polymer foam less dense than the bulk matrix material, polyurethane?

Section 2: Materials Selection with Ashby Charts

Use the following three charts to help answer Question 4



4. In the course, we discussed ranking materials for selection based on the design needs of the product. For bar charts, we are focusing on maximizing or minimizing our single material property. For bubble charts, we are focusing on different quadrants of the chart.

For the set of products listed below, identify the area within each provided chart where we should focus our selection efforts. Do the areas of focus change across the set of products? Why or why not?

a) Bicycles:

A child's bike vs. a competitive racing bike

b) Plates:

Disposable plates vs. fine china plates