

Design Exercise #1. Frame Deflection Calculations

Assigned: 8/19/13, Due: 8/26/13

Consider a 6' long beam with a 400 lb load in the center and simply supported on each end.

What is the maximum deflection if the beam is made from the following materials supplied by McMaster-Carr?

1. 6566K25
2. 6566K33
3. 7779T37
4. 1668T19

How much does each beam weigh?

What is the maximum bending stress in the beam? How does this compare to the material's yield strength (what percentage)? NOTE: you can the yield strength from matweb.com based on the type of material (e.g., 4130 steel) that mcmaster.com lists for each of the above parts.

Repeat the calculation assuming that the beam's weight is a uniformly distributed load. Is there a significant difference?