Exercises

1. A metallic wire 1 m long and with a diameter of 1.5 mm deforms plastically when the load applied reaches 15 kg. The modulus of elasticity of the wire is 120 GPa.

a. Calculate the yield strength of the material.
b. Calculate the modulus of resilience.
c. Calculate the maximum length that this wire can reach without plastic deformation.
d. Considering that when it is loaded with 30kg the strain is 1%, calculate the final length of the wire once it has been unloaded.

2. For a particular kind of brass, plastic deformation begins at 330 MPa, and its elastic modulus is 98 GPa. Answer the following questions:

a. Calculate the yield strength of the material.
b. Calculate the modulus of resilience.
c. Calculate the maximum stress and the maximum force that can be applied to a bar of this brass with a cross-section of 200 mm^2 without plastic deformation taking place.