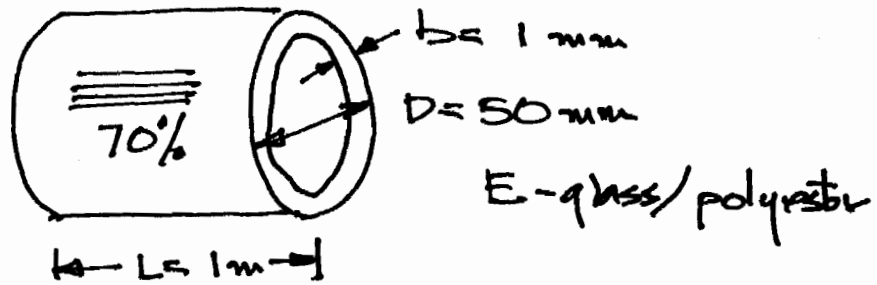


6.8 (1)



$$E_1 = V_f E_f + V_m E_m = (0.7)(76 \text{e}9) + (0.3)(3 \text{e}9) = 54.1 \text{e}9 \text{ Pa}$$

$$\nu_{12} = V_f \nu_f + V_m \nu_m = (0.7)(0.22) + (0.3)(0.38) = 0.268$$

Axial load $F = 10 \text{ kN}$

$$\sigma_1 = \frac{F}{A} = \frac{10 \text{e}3}{\pi (0.05)(0.001)} = 63.7 \text{e}6 \text{ Pa}$$

$$\epsilon_1 = \frac{\sigma_1}{E_1} = \frac{63.7 \text{e}6}{54.1 \text{e}9} = 1.18 \text{e}-3$$

$$\Delta_L = \epsilon_1 L = (1.18 \text{e}-3)(1) = 1.18 \text{e}-3 \text{ m}$$

$$\epsilon_2 = -\nu_{12} \epsilon_1 = -(0.268)(1.18 \text{e}-3) = -0.316 \text{e}-3$$

$$\Delta_D = \epsilon_2 D = (-0.316 \text{e}-3)(0.05) = 15.8 \text{e}-6 \text{ m}$$