

Break δ (stress) into δ_x & δ_y
look at effects separately.

$$\text{Because } J = \frac{E}{\delta} = \frac{\delta}{\delta}$$

$$\delta_x \quad \epsilon_x(1 \text{ month}) = \frac{J(1 \text{ month}) \delta_x}{\delta}$$

$$\epsilon_y(1 \text{ month}) = \epsilon_z(1 \text{ month}) = -\nu \epsilon_x = -\frac{\nu J(1 \text{ month}) \delta_x}{\delta}$$

radial dirxn

$$\delta_y \quad \epsilon_y(1 \text{ month}) = \frac{J(1 \text{ mon}) \delta_y}{\delta}$$

$$\epsilon_x = \epsilon_z(1 \text{ mon}) = -\nu \epsilon_y(1 \text{ mon}) = -\frac{\nu J(1 \text{ mon}) \delta_y}{\delta}$$

Stress is uniform $\Rightarrow \delta_x = \delta_y$

$$\epsilon_x(1 \text{ mon}) = \epsilon_y(1 \text{ mon}) = [1 - \nu] J(1 \text{ mon}) \delta$$

$$\epsilon_z(1 \text{ mon}) = -2\nu J(1 \text{ mon}) \delta \quad \leftarrow \text{adding 2 contributions together}$$

$$\epsilon_x = \epsilon_y = (1 - 0.41) (2 \times 10^{-9}) (1.6 \times 10^6)$$

$$= 1.89 \times 10^{-3}$$

$$\epsilon_z = - (2 \times 0.41) (2 \times 10^{-9}) (1.6 \times 10^6)$$

$$= -2.62 \times 10^{-3}$$

$$\Delta \text{ Diameter} = \frac{(0.16)(\epsilon_x)}{(400)(1.89 \times 10^{-3})} = 0.756 \text{ mm}$$

$$\Delta \text{ thickness} = (5 \text{ mm})(-2.62 \times 10^{-3}) = -1.31 \times 10^{-2} \text{ mm}$$