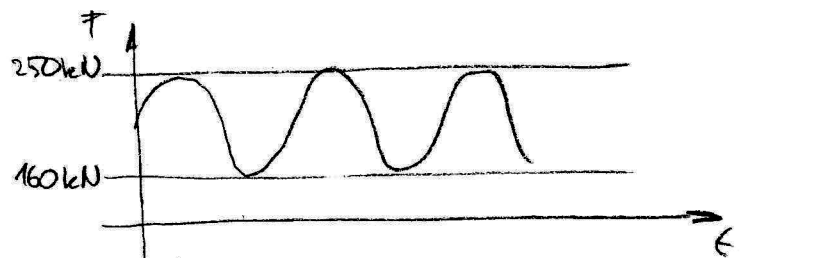
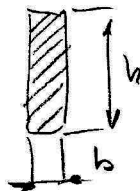
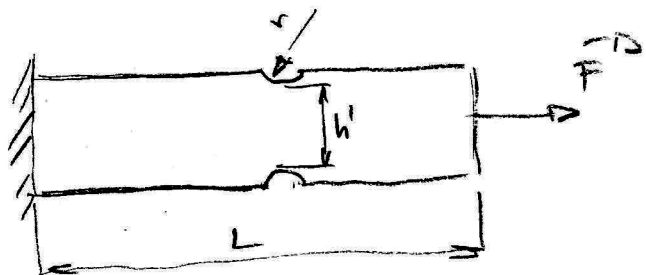
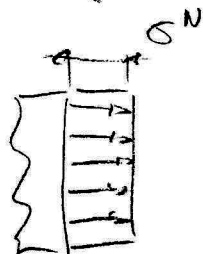


Pr: Určete bezpečnost vzhledem k MS uvolněné elastičnosti a současně podle obrázku.



1. VW

$$N = F, x \in (0, L)$$



2. Přesun

$$\sigma_{\max} = \frac{N_{\max}}{S} = \frac{250 \cdot 10^3}{30 \cdot 69} = 121 \text{ MPa}$$

$$\sigma_{\min} = \frac{N_{\min}}{S} = \frac{160 \cdot 10^3}{30 \cdot 69} = 77 \text{ MPa}$$

$$\sigma_m = \frac{1}{2} (\sigma_{\max} + \sigma_{\min}) = \frac{1}{2} (77 + 121) = 99 \text{ MPa}$$

$$\sigma_a = \frac{1}{2} (\sigma_{\max} - \sigma_{\min}) = \frac{1}{2} (121 - 77) = 22 \text{ MPa}$$

material: ocel, povrch utiřován broušený

$$\sigma_{\text{pt}} = 900 \text{ MPa}$$

$$b = 30 \text{ mm}$$

$$\sigma_c = 300 \text{ MPa}$$

$$h = 40 \text{ mm}$$

$$\alpha = 2$$

$$h' = 69 \text{ mm}$$

$$r = 3$$

$$h_1 = 10 \text{ mm}$$

$$\sigma_c^* = \frac{\sigma_{\text{pt}} \eta_{\sigma}}{\beta_{\sigma}} \sigma_c = \frac{0.84 \cdot 1.51}{1.84} \cdot 300 = 210 \text{ MPa}$$

součinitel tvaru

$$\eta_{\sigma} = \eta_1 \eta_{2\sigma} = 0.84 \cdot 1 = 0.84$$

$$\eta_1 = 1 - \sqrt{k \cdot \log \frac{h}{h_1}} = 1 - \sqrt{2 \cdot 10^{-2} \cdot \log \frac{40}{10}} = 0.84$$

$$\eta_{2\sigma} = 1$$

součinitel umělosti

$$\beta = \frac{\alpha}{1 + \frac{\alpha-1}{\alpha} \frac{F}{F_r}} = \frac{2}{1 + \frac{2-1}{2} \frac{0.84}{\sqrt{3}}} = 1.84$$

$$k = \frac{220}{900} = 0.24$$

soudimikl poudin

$$\eta_s = \eta_1 \eta_2 = 0.89 \cdot 1.8 = 1.51$$

$$\eta_1 = 0.89$$

$$\eta_2 = 1.8$$

Goodman:

$$\frac{\sigma_a}{\sigma_c^*} + \frac{\sigma_m}{\sigma_{pt}} = \frac{1}{k} \Rightarrow k = \frac{\sigma_c^*}{\sigma_m \frac{\sigma_c^*}{\sigma_{pt}} + \sigma_a} = \frac{210}{99 \cdot \frac{210}{900} + 22} = \boxed{4.66}$$