Sveiseutnyttelse

Beregning: - - - - - - - - - - -

Materialegenskaper

$$f_u := 510 \ \text{MPa} \qquad \beta_w := 0.9 \qquad \gamma_{M2} := 1.25$$

$$\sigma_{cr} := \frac{f_u}{\beta_w \cdot \gamma_{M2}} = 453.3333 \ \text{MPa}$$

Sveisegeometri:

$$a := 5 \ \text{mm}$$

$$L := 100 \ \text{mm}$$

$$I_s := a \cdot \frac{L^3}{12} = 4.1667 \cdot 10^5 \ \text{mm}^4$$

Lastvirkning per sveisesøm:

$$N := 100 \ \text{kN} \qquad V := 100 \ \text{kN} \qquad M := 100 \ \text{kN m}$$

$$\sigma_N := \frac{N}{L \cdot a \cdot \sqrt{2}} = 141.4214 \ \text{MPa} \qquad\qquad \tau_N := \sigma_N$$

$$\tau_V := \frac{V}{L \cdot a} = 200 \ \text{MPa}$$

$$\sigma_M := \frac{M}{\sqrt{2} \cdot I_s} \cdot \frac{L}{2} = 8485.2814 \ \text{MPa} \qquad\qquad \tau_M := \sigma_M$$

$$\sigma := \sigma_N + \sigma_M = 8626.7027 \ \text{MPa}$$

$$\tau := \tau_N + \tau_V + \tau_M$$

"Mises"-spenning

$$\sigma_j := \sqrt{\sigma^2 + 3 \cdot \tau^2} = 17554.26 \ \text{MPa}$$

$$\eta := \frac{\sigma_j}{\sigma_{cr}} = 38.7226$$