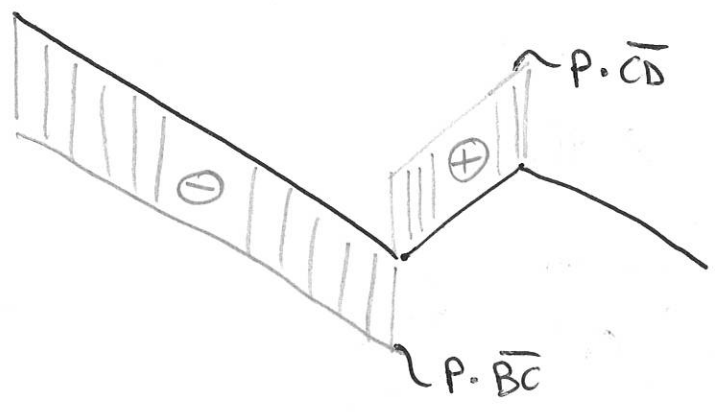
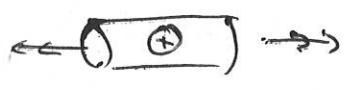
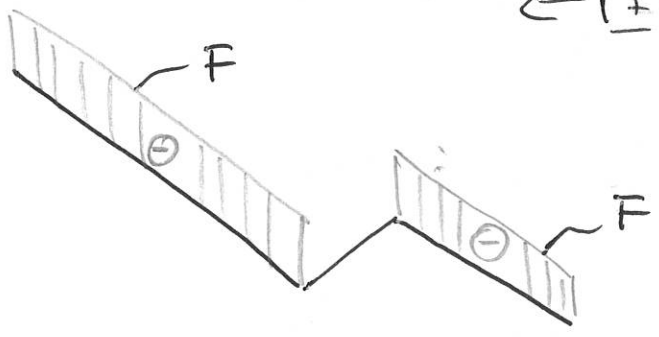


$\hat{M}_t$



2



punto più sollecitato  $\rightarrow A$

$$M_{gTOT} = \sqrt{[3P_0(\overline{AB+CD})]^2 + (2F_0 \overline{BC})^2} = 99318 \text{ Nmm}$$

$$M_c = 3P_0 \overline{BC} = 42000 \text{ Nmm},$$

$$\sigma_{pe,nom} = \frac{32 M_{gTOT}}{\pi(D^4 - d^4)} D = ~~110~~ 110 \text{ MPa}$$

$$\tau_{t,nom} = \frac{16 M_c}{\pi(D^4 - d^4)} D = ~~16~~^{23} \text{ MPa}$$

$$\sigma_{VM}^* = \sqrt{(K_{t,pe} \cdot \sigma_{pe,nom})^2 + 3(K_{t,t} \tau_{t,nom})^2} = ~~208~~ \text{ MPa}$$

$$\sigma_{VM}^* \leq \frac{R_s}{\eta_{statico}} \Rightarrow \eta_{statico} = ~~2,1~~ 1,7$$

Ver fatica:

$$1) \sigma_a = \frac{32 \cdot P_0(\overline{AB+CD})}{\pi(D^4 - d^4)} D = 33 \text{ MPa}$$

$$\tau_a = \frac{16 P_0 \overline{BC}}{\pi(D^4 - d^4)} D = 8 \text{ MPa}$$

$$\sigma_{GP}^* = \sqrt{\sigma_a^2 + \left(\frac{\sigma_{eim}}{\tau_{eim}}\right)^2 \tau_a^2} \leq \frac{\sigma_{eim}}{\eta}$$

$$\sigma_{eim} \approx \frac{0,5 R_m b_2 b_3}{1 + q(K_{t,pe} - 1)} = 105 \text{ MPa}$$

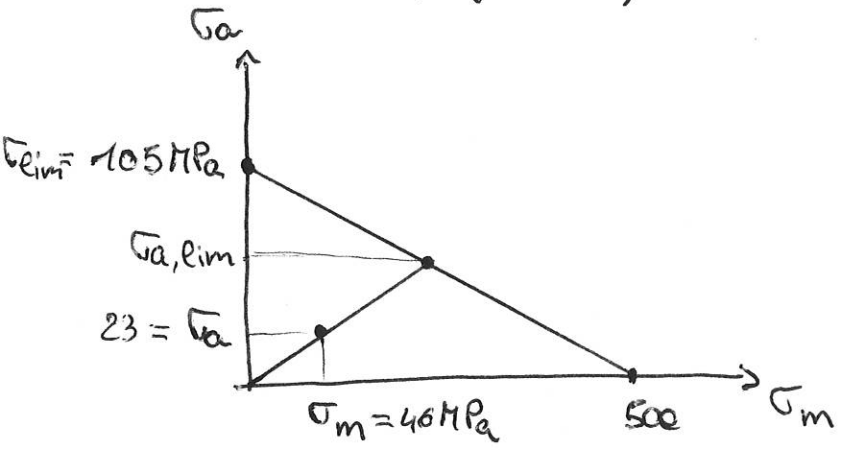
$$\tau_{eim} \approx \frac{0,28 R_m b_2 b_3}{1 + q(K_{t,t} - 1)} = 66 \text{ MPa}$$

$$\sigma_{GP}^* = 35 \text{ MPa} \Rightarrow \eta_{fatica} = \frac{\sigma_{eim}}{\sigma_{GP}^*} = 3$$

2)

$$\sigma_a = \frac{32 \cdot F_0 \cdot \bar{BC}}{\pi (D^4 - d^4)} \cdot D = 23 \text{ MPa}$$

$$\sigma_m = \frac{32 \cdot 2 F_0 \cdot \bar{BC}}{\pi (D^4 - d^4)} \cdot D = 46 \text{ MPa}$$



$$\sigma_{a,lim} = \frac{105}{1 + \frac{105}{500} \cdot \frac{46}{23}} = 74 \text{ MPa}$$

$$\sigma_a \leq \frac{\sigma_{a,lim}}{\eta_{f2}} \Rightarrow \eta_{f2} = 3,2$$