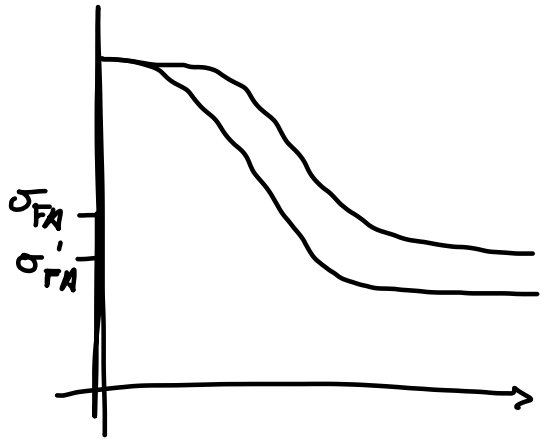
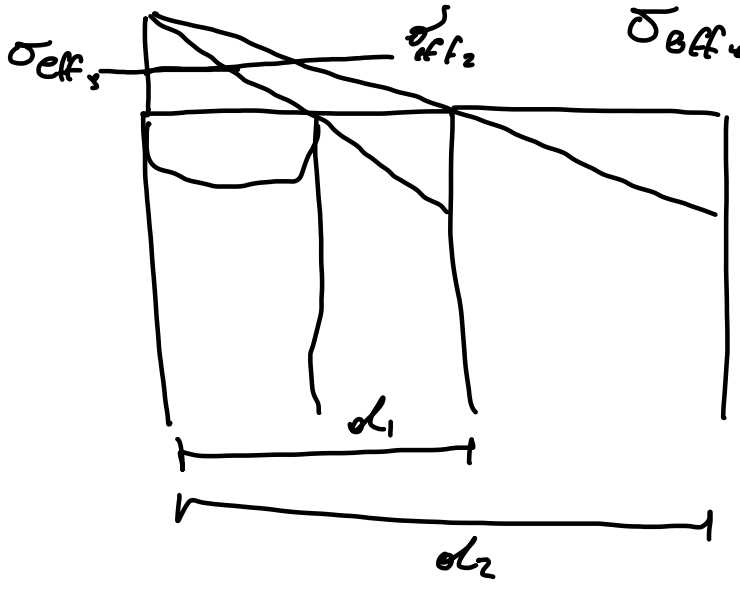
Lezione 19 - Fatica

$b_2 = \dfrac{\sigma'_{FA}}{\sigma_{FA}}$ → da provino non standard

→ da provino standard



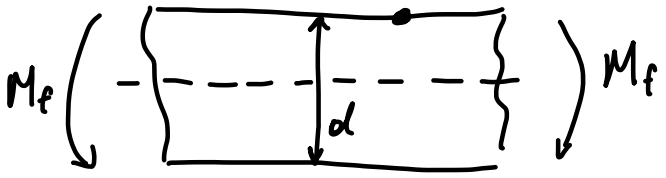


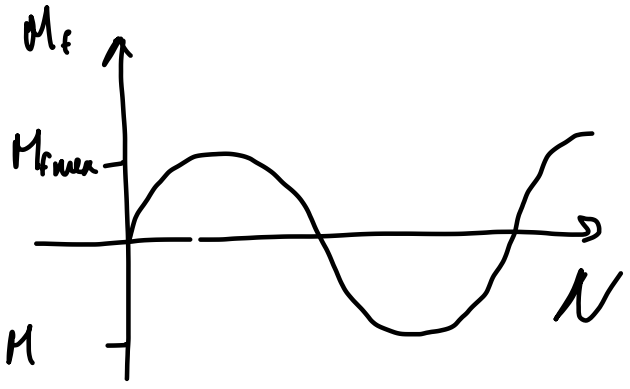
$\sigma_{eff\,d_1} < \sigma_{eff\,d_2}$

$\sigma_{FAf} \approx 0{,}5\ \sigma_m$

$\sigma_{FAa} \approx 0{,}7\ \sigma_m$

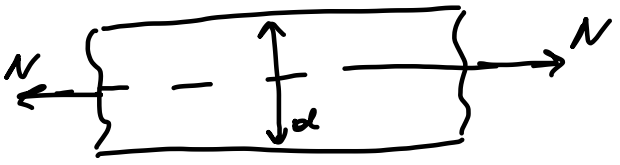
$d = 80\,mm$



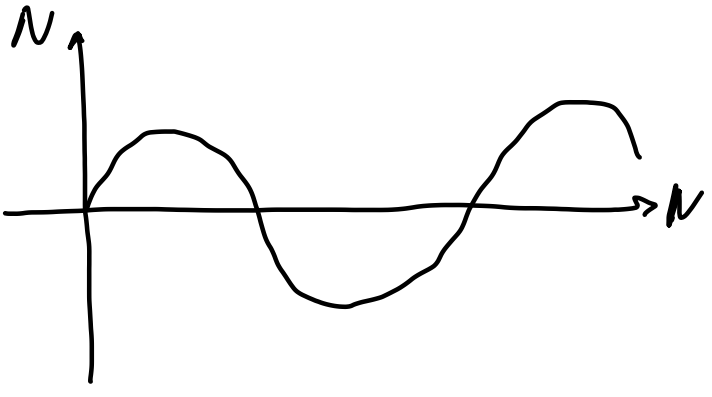


$$\sigma_a = \frac{32\,M_{f\,max}}{\pi d^3}$$

$$\boxed{\sigma_a \leq \frac{\sigma_{FA} \cdot b_2}{\eta}}$$



$d = 80\,mm$



$$\sigma_a = \frac{N_{alt}}{A_0} \qquad \sigma_a \leq \frac{\sigma_{FA,a}}{\eta}$$

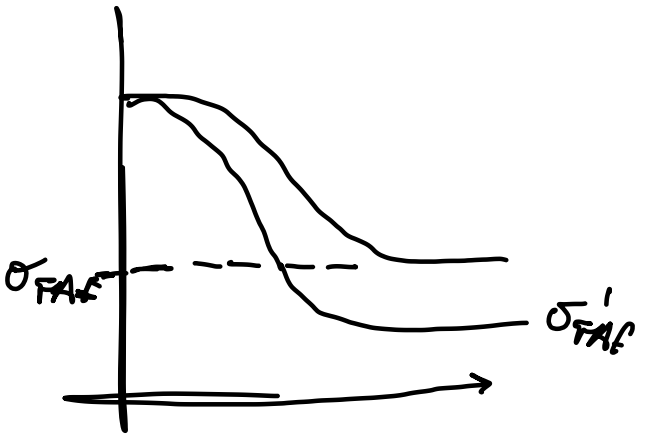
$$\sigma_{FAa} = 0{,}35\,R_m$$

$$\sigma_{FA} =$$

$$\sigma_a \leq \frac{\sigma_{FAf}\, b_2}{\eta}$$

Provino standard

- $d = 10\,mm$
- $R_b \cong 0{,}3\,\mu m$
- $K_b = 1$



Provino Non standard

$d \geq 10\,mm$

$K_t = 1$

$R_b = 2\,\mu m$

$$b_3 = \frac{\sigma'_{FAf}}{\sigma_{FA}}$$

b_3 ← Effetto di rugosità

b_3 dipende dalla rugosità e il carico di rottura

K_f = effetto d'intaglio

$$K_f = \frac{\sigma_{FA}}{\sigma'_{FA}}$$

$K_f < K_t$ ← dipende da forma d'intaglio

$K_b = 1 + q(K_t - 1)$ ← sensibilità all'intaglio $0 \leq q \leq 1$

q → 0 → non c'è sensibilità ad intaglio

→ 1 → $K_f = K_t$ (massima sensibilità ad intaglio)

Il raggio d'intaglio ha effetto su q ma anche su K_t, l'effetto su K_t è maggiore allora con raggi decrescenti aumenta K_f, quindi quando progettiamo vogliamo sempre il raggi maggiori possibili e cricchi di natura maggiori

Peterson

$$q = \frac{1}{1+\frac{a}{r}}$$

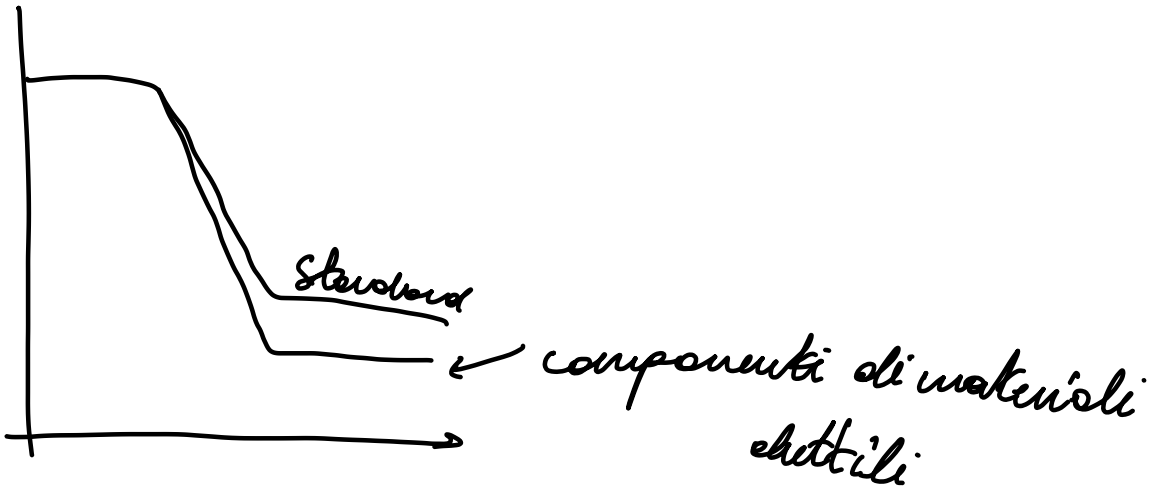
Neuber

$$q = \frac{1}{1+\sqrt{\frac{\rho}{r}}}$$

$\sigma_m \uparrow \Rightarrow \sqrt{\rho} \downarrow \Rightarrow \frac{\sqrt{\rho}}{\sqrt{r}} \downarrow \Rightarrow q \uparrow$

$r \uparrow \quad \frac{\sqrt{\rho}}{\sqrt{r}} \downarrow \quad q \uparrow$

$$\sigma'_{FAf} = \frac{\sigma_{FAf}\, b_2 b_3}{K_f} \Rightarrow \sigma_a \leq \frac{\sigma'_{FA,f}}{\eta}$$


Standard
componenti di materiali
elettili