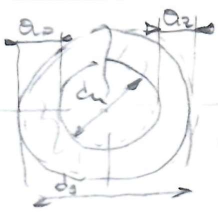
6.2

C22E: $\tau_{D(-1)} = 130$, $\tau_{D(0)} = 200$



$\psi = \dfrac{d_u}{d_з}$

$d_з = d_u + 2a_z$

$\tau < \tau_{doz}$

$$\frac{T}{W_p} < \frac{[\tau]}{S} \rightarrow W_p > \frac{T \cdot S}{[\tau]} \rightarrow \frac{d_з^3 \pi}{16}(1-\psi^4) > \frac{T \cdot S}{[\tau]}$$

$$1-\psi^4 = \frac{16 \cdot T \cdot S}{d_з^3 \pi \cdot [\tau]}$$

$$\psi^4 = 1 - \frac{16 \cdot T \cdot S}{d_з^3 \pi [\tau]} \Rightarrow \psi = \sqrt[4]{1 - \frac{16 \cdot T \cdot S}{d_з^3 \pi [\tau]}}$$

$$\frac{d_u}{d_з} = \sqrt[4]{1 - \frac{16 \cdot T \cdot S}{d_з^3 \pi [\tau]}} \Rightarrow d_u = d_з \cdot \sqrt[4]{1 - \frac{16 \cdot T \cdot S}{d_з^3 \pi [\tau]}}$$

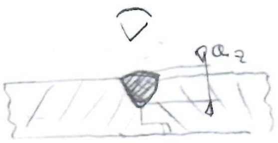
а) $R_T = -1 \Rightarrow R_\tau = -1$

$$[\tau] = \tau_{DM} = \tau_{D(-1)M} = \frac{\tau_{D(-1)}}{K_{D_u}} = \tau_{D(-1)} \cdot \xi_1 \cdot \xi_2 = 130 \cdot 0.5 \cdot 0.9 = 58.5 \frac{N}{mm^2}$$

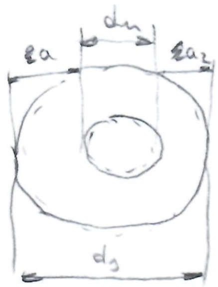
квалитет заваривања: високи, динамичко напрезање $\rightarrow \xi_2 = 0{,}85 - 0{,}95$

$\xi_2 = 0.9$

$\xi_{1u} = 0.5$



сучеони нормални на увијање



$d_з = d_u + 2a_z$

$2a_z = d_з - d_u$

$a_z = \dfrac{d_з - d_u}{2}$

$$d_u = 50 \cdot \sqrt[4]{1 - \frac{16 \cdot 500\,000 \cdot 2}{50^3 \pi \cdot 58{,}5}} = 37.11$$

$$a_z = \frac{50 - 37.11}{2} = 6.45 \text{ mm}$$

б) $[\tau] = \tau_{DM} = \tau_{D(0)M} = \dfrac{\tau_{D(-1)M}}{1 - 0.5\, t_{sDM}} = 103.1 \dfrac{N}{mm^2}$

$$K_{Du} = \frac{1}{\xi_{1u} \xi_2} = 2{,}23$$

$$t_{sDu} = 1 + \left(1 - \frac{2 \cdot \tau_{D(-1)}}{\tau_{D(0)}}\right)\frac{1}{K_{Du}} = 1 + \left(1 - \frac{2 \cdot 130}{200}\right)\frac{1}{2.23} = 0.865471$$

$$d_u = 50 \sqrt[4]{1 - \frac{16 \cdot 500\,000 \cdot 2}{50^3 \pi \cdot 103.1}} = 44.1 \text{ mm}$$

$$a_z = \frac{50 - 44.1}{2} = 2.95 \text{ mm}$$