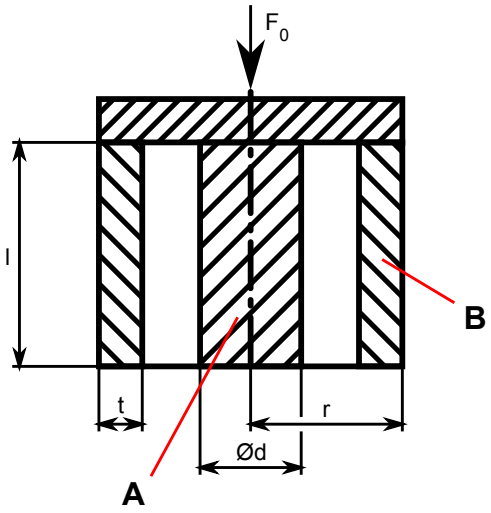


Figure 1: Skizze

$$F_0 = 25kN \tag{1}$$
$$r = 75mm \tag{2}$$
$$t = 13mm \tag{3}$$
$$l = 200mm \tag{4}$$
$$E_A = 200GPa = 2 \cdot 10^5 \frac{N}{mm^2} \tag{5}$$
$$E_B = 100GPa = 1 \cdot 10^5 \frac{N}{mm^2} \tag{6}$$
$$F_A = F_B \tag{7}$$
$$F_A = \frac{\Delta l \cdot E_A \cdot A_A}{l} \tag{8}$$
$$F_B = \frac{\Delta l \cdot E_B \cdot A_B}{l} \tag{9}$$
$$\tag{10}$$

$$\frac{\Delta l \cdot E_A \cdot A_A}{l} = \frac{\Delta l \cdot E_B \cdot A_B}{l} \tag{11}$$
$$E_A \cdot A_A = E_B \cdot A_B \tag{12}$$
$$E_A \cdot \frac{\pi \cdot d^2}{4} = E_B \cdot \frac{\pi \cdot ((2r)^2 - (2(r-t))^2)}{4} \tag{13}$$
$$E_A \cdot \frac{d^2}{4} = E_B \cdot (r^2 - (r-t)^2) \tag{14}$$
$$\tag{15}$$

$$d = \sqrt{\frac{E_B \cdot (r^2 - (r-t)^2) \cdot 4}{E_A}} \tag{16}$$

$$d = \sqrt{\frac{1 \cdot 10^5 \frac{N}{mm^2}((75mm)^2 - (75mm - 13mm)^2) \cdot 4}{2 \cdot 10^5 \frac{N}{mm^2}}} \tag{17}$$

$$d = 59,68mm \tag{18}$$

$$F_0 = F_A + F_B \tag{19}$$

$$F_0 = \frac{\Delta l \cdot E_A \cdot A_A}{l} + \frac{\Delta l \cdot E_B \cdot A_B}{l} \tag{20}$$

$$F_0 = \frac{\Delta l(E_A \cdot A_A + E_B \cdot A_B)}{l} \tag{21}$$

$$\Delta l = \frac{F_0 \cdot l}{E_A \cdot A_A + E_B \cdot A_B} \tag{22}$$

$$\Delta l = \frac{25000N \cdot 200mm}{2 \cdot 10^5 \frac{N}{mm^2} \cdot \frac{\pi \cdot (59.68mm)^2}{4} + 1 \cdot 10^5 \frac{N}{mm^2} \cdot \pi \cdot ((75mm)^2 - (75mm - 13mm)^2)} \tag{23}$$

$$\Delta l = 4,46832 \cdot 10^{-3}mm \tag{24}$$

$$F_A = \frac{\Delta l \cdot E_A \cdot A_A}{l} \tag{25}$$

$$F_A = \frac{4,46832 \cdot 10^{-3}mm \cdot 2 \cdot 10^5 \frac{N}{mm^2} \cdot \frac{\pi \cdot (59,68mm)^2}{4}}{200mm} \tag{26}$$

$$F_A = 12499,48N \tag{27}$$

$$F_B = \frac{\Delta l \cdot E_B \cdot A_B}{l} \tag{28}$$

$$F_B = \frac{4,46832 \cdot 10^{-3}mm \cdot 1 \cdot 10^5 \frac{N}{mm^2} \cdot \pi \cdot ((75mm)^2 - (75mm - 13mm)^2)}{200mm} \tag{29}$$

$$F_B = 12500,52N \tag{30}$$