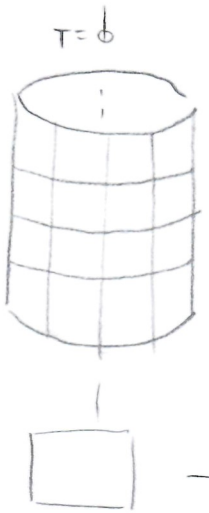
4.2 $d = 20\,mm$

$S = 1820 \cdot 10^{-6}$



$S = \frac{\Delta R}{R} = B \cdot \varepsilon_{45}$

$\varepsilon_{45} = \frac{\tau}{E}(1+\nu)$

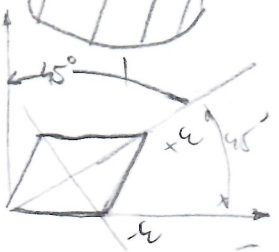
$G = \frac{E}{2(1+\nu)}$

$E = 2G(1+\nu) \Rightarrow$

$\tau = G \cdot \varepsilon_{45}$

$\tau = \frac{E}{1+\nu} \cdot \varepsilon_{45}$

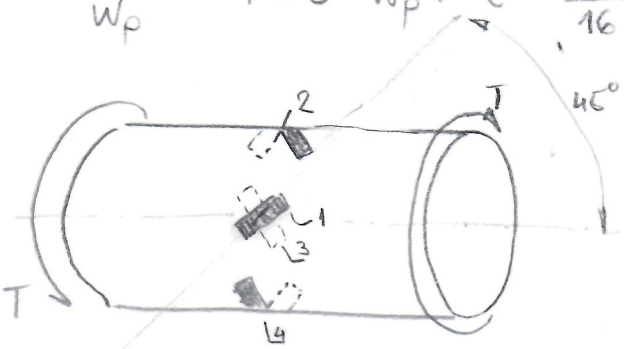
$\varepsilon_{45} = \frac{S}{B} = \frac{1820 \cdot 10^{-6}}{4} = 455 \cdot 10^{-6}$

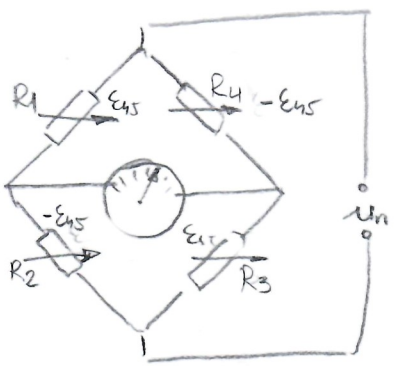


$\tau = \frac{\varepsilon_{45} \cdot E}{1+\nu} = \frac{455 \cdot 10^{-6} \cdot 210\,000}{1+0{,}3} = 73{,}5 \frac{N}{mm^2}$

$\tau = G \cdot \varepsilon_{45} = \frac{E}{1+\nu} \cdot \varepsilon_{45}$

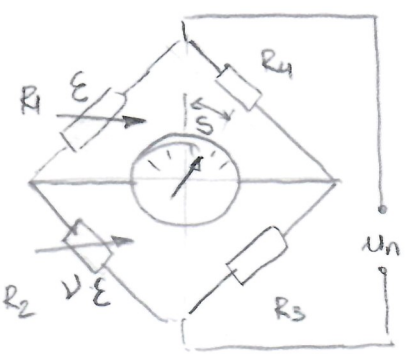
$\tau = \frac{T}{W_p} \Rightarrow T = \tau \cdot W_p = \tau \cdot \frac{d^3 \pi}{16} = 73{,}5 \cdot \frac{20^3 \cdot \pi}{16} = 115\,Nm$





$B = 4$

4.3 $S = 1510 \cdot 10^{-6}$



Појачање мерног моста:

$B = 1+\nu$

$S = B \cdot \varepsilon \Rightarrow \varepsilon = \frac{S}{B} = \frac{1510 \cdot 10^{-6}}{1+\nu} = \frac{1510 \cdot 10^{6}}{1+0{,}3} = 1161 \cdot 10^{-6}$

$\sigma_F = E \cdot \varepsilon = 210\,000 \cdot 1161 \cdot 10^{-6} = 243{,}81 \frac{N}{mm^2}$