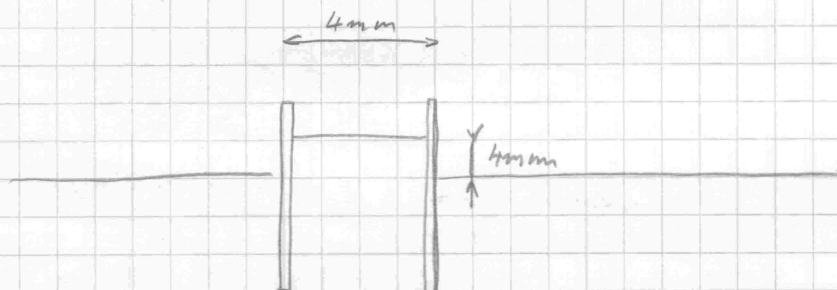


- ① Otvorena na obje strane, čista ($\varphi=0$) staklena cijevica uronjena je vertikalno u neki posudu koja miruje. Promjer cijevice 4 mm, a razina vode u cijevici 4 mm iznad razine vode u posudi. Koliko je površinska napetost vode u N/m. $\rho=1000$ $g=9.81$



$$\varphi=0 \rightarrow \text{čisto vodu}$$

Formula kapilarnost u cijevici:

$$\rho g r^2 \pi H = G 2 r \pi \cos \varphi$$

$$G = \frac{\rho g r^2 \pi H}{2 r \pi} \left[\frac{N}{m} \right]$$

$$\rho = 1000 \frac{kg}{m^3} \quad g = 9.81 \frac{m}{s^2} \quad d = 4 mm = 0.004 m$$

$$r = \frac{d}{2} = 0.002 m$$

$$H = 4 mm = 0.004 m$$

$$G = \frac{1000 \frac{kg}{m^3} \cdot 9.81 \frac{m}{s^2} (0.002)^2 m^2 \cdot 0.004 m}{2 \cdot 0.002 m} = 0.03924 \left[\frac{\frac{kg}{m^3} \cdot \frac{m}{s^2} \cdot m^2 \cdot m}{m} = \frac{kg}{s^2} \right]$$

$$\frac{kg}{s^2} =$$

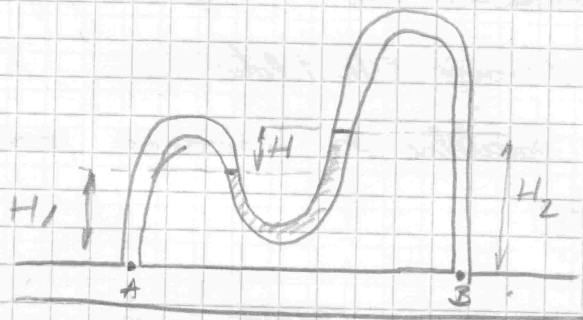
$$\frac{N}{m} = \frac{m \cdot a}{m} = \frac{kg \cdot \frac{m}{s^2}}{m} = \frac{kg}{s^2} \checkmark$$

② Ako je $p_A = 2 \text{ bar}$, $H = 0.5 \text{ m}$, koliki je p u B.

$$\rho_1 = 1000 \text{ kg/m}^3$$

$$\rho_2 = 13600 \text{ kg/m}^3$$

$$g = 9.81 \text{ m/s}^2$$



$$p_A - \rho_1 g H_1 - \rho_2 g H + \rho_1 g H_2 = p_B$$

$$H_2 = H_1 + H$$

$$p_A - \rho_1 g H_1 - \rho_2 g H + \rho_1 g (H_1 + H) = p_B$$

$$p_A - \cancel{\rho_1 g H_1} - \rho_2 g H + \cancel{\rho_1 g H} + \rho_1 g H_1 = p_B$$

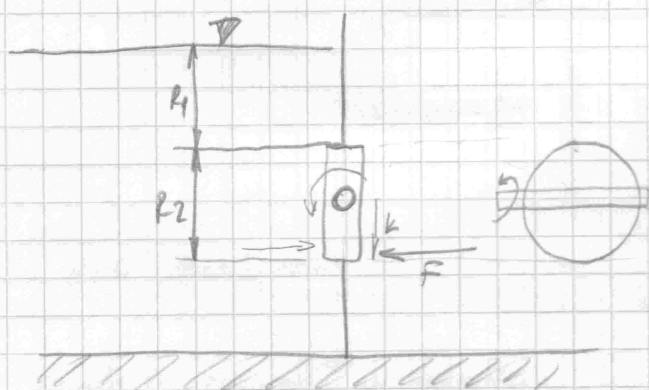
$$p_A - p_B = g H (\rho_2 - \rho_1) \Rightarrow p_B = p_A - g H (\rho_2 - \rho_1)$$

$$= 2 \cdot 10^5 \frac{\text{N}}{\text{m}^2} - 9.81 \frac{\text{m}}{\text{s}^2} \cdot 0.5 \text{ m} \cdot 12600 \frac{\text{kg}}{\text{m}^3}$$

$$= 2 \cdot 10^5 \frac{\text{N}}{\text{m}^2} - 61803 \frac{\text{N}}{\text{m}^2} = \underline{\underline{1,38197 \text{ bar}}}$$

Z.3) Ravna okrugla ravna ploha, $d=4m$, zatvara otvor istog oblika i dimenzija smješten u vertikalnoj stijenci spremnika, slika $R_1=4m$. Kolikova je minimalna sila F koji će spriječiti rotaciju (otvaranje) plohe, zbog djelovanja sile \pm lako u spremniku, ako simetrale paralelne sa slobodnom površinom vode?

$$I_0 \text{ kraka je } \frac{\pi r^4}{4}$$



$$R_1 = 4m$$

$$R_2 = 4m \quad r = 2m$$

$$\sum M = 0$$

$$F \cdot k = F \cdot 2m$$

$$k = 2 - l$$

$$l = \frac{I_0}{h \cdot A} = \frac{\frac{\pi r^4}{4}}{8m \cdot \pi r^2} = \frac{r^2}{32}$$

$$k = 2 - \frac{r^2}{32} = 1.875$$

$$F_r = \rho g h A = 1000 \cdot 9.81 \cdot 8m \cdot 2^2 \pi = 986,208 \text{ kNm}$$

$$F = 986,208 \cdot \frac{1.875}{2} = 924,57 \text{ kN}$$