

7.3

// marker v på rotationen? över/underskruv?

Antar $T = 20^\circ\text{C}$
 $P = P_{\text{atm}}$

Underskruv ger kraft näot \parallel marken!

• $v = 57 \text{ km/h} = 15,83 \text{ m/s}$

• $1,5 \text{ } \vec{b} \rightarrow \vec{b} \cdot \vec{v}$

• $m = 58 \text{ g}$

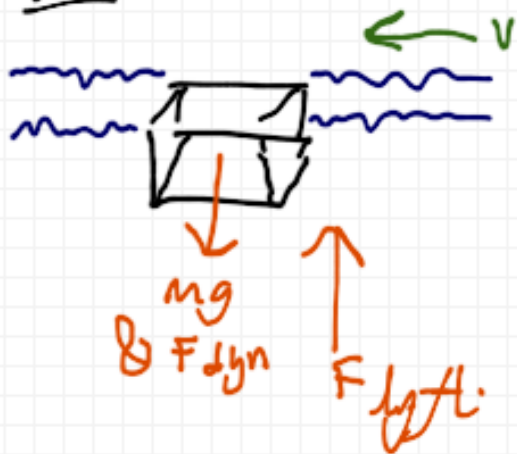
• $d = 66 \text{ mm} \Rightarrow r = 33 \cdot 10^{-3} \text{ m}$



$$F = 2\pi r^3 v \omega \Rightarrow \omega = \frac{F}{2\pi r^3 v} = 133 \text{ rad/s}$$

$$\rho_{\text{luft}} = 1,2 \text{ kg/m}^3$$

7.6

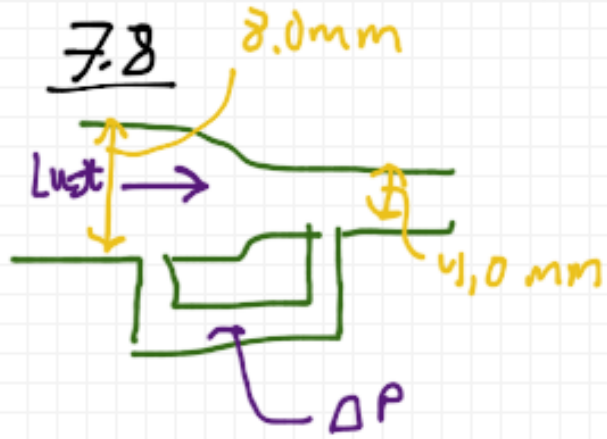


$$F_{lyft} - mg - F_{dyn} = 0 \Leftrightarrow F_{lyft} = F_{dyn} + mg$$

$$F_{lyft} = \rho_{\text{water}} V g$$

$$F_{dyn} = \rho_{\text{water}} \frac{v^2}{2} A \quad \left(\rho = \frac{F}{A}; \rho_{dyn} = \frac{\rho v^2}{2} \right)$$

$$v = \underline{\underline{0,41 \text{ m/s}}}$$



a) Densitet för utandningsluften?

Luft, 310K

$$pV = nRT \Leftrightarrow V = \frac{nRT}{p} = \frac{V \frac{m}{M} \cdot RT}{p} \Leftrightarrow \frac{m}{V} = \frac{pM}{RT}$$

$$\rho = \frac{pM}{RT} = \frac{101,325 \cdot 10^3 \text{ Pa} \cdot 29 \cdot 10^{-3} \text{ kg/mol}}{8,314 \cdot 310} = 1,14 \text{ kg/m}^3$$

7.8b) Strömungshastigkeit?

Smala delen.

$$\Delta p = 380 \text{ Pa}$$

$$\Delta p_{\text{stat}} = p_{\text{dyn},1} \left[\left(\frac{A_1}{A_2} \right)^2 - 1 \right] \Leftrightarrow p_{\text{dyn},1} = \frac{\Delta p_{\text{stat}}}{\left[\left(\frac{A_1}{A_2} \right)^2 - 1 \right]}$$

$$p_{\text{dyn},1} = \rho v_1^2$$

$$v_1 = \sqrt{\frac{\Delta p_{\text{stat}} \cdot 2}{\left(\left(\frac{A_1}{A_2} \right)^2 - 1 \right) \cdot \rho}} = 27 \text{ m/s}$$

$$\phi = v_1 A_1 = v_2 A_2 \Leftrightarrow v_2 = \frac{v_1 A_1}{A_2}$$

7.8 c)

$$t = 15 \text{ s}$$

$$\Delta p = 380 \text{ Pa}$$

$$V = ?$$

$$V = \dot{V} \cdot t = A_2 v_2 t = 5,0 \cdot 10^{-3} \text{ l}$$