Dæmi 1, (1-14-74)

$$M = 75{,}0\ \text{kg}$$

V: rúmmál, tóm Lunga

$V+V_L$: rúmmál + Lunga, Lunga full

Lunga tóm 3% ofan -> hlutfall = 0,97

-11- full 5% -11- -> -11- = 0,95

$$V\rho_E = M$$

$$[V+V_L]\rho_F \simeq M$$

$$[V+V_L]\rho_F = V\rho_E$$

$$\rho_E = 970\ \frac{\text{kg}}{\text{m}^3},\ \rho_F = 950\ \frac{\text{kg}}{\text{m}^3}$$

$$[V+V_L]\rho_F = V\rho_E \rightarrow V_L = \frac{V}{\rho_F}\{\rho_E - \rho_F\}$$

$$\rightarrow \boxed{V_L = V\frac{\rho_E-\rho_F}{\rho_F} = \frac{M}{\rho_E}\left\{\frac{\rho_E}{\rho_F}-1\right\}}$$

$$\simeq \frac{75{,}0}{970}\left\{\frac{970}{950}-1\right\} = 1{,}63\cdot10^{-3}\ \text{m}^3$$

$$\simeq 1{,}63\ \text{L}$$

Örugglega ekki ofmat. Eðlilegt væri að sjá 2.5 - 5.0 L

Dæmi 2, (1-14-90)

ρ = Fasti, Finna $\Delta p(v_1, A_1, A_2, \rho)$

Enginn hæðarmunur, jafna Bernoullis fyrir þrengingu

$$p_1 + \frac{1}{2}\rho v_1^2 = p_2 + \frac{1}{2}\rho v_2^2$$

Massavarðveisla

$$A_1v_1 = A_2v_2$$

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

$$\rightarrow \{p_1-p_2\} = \frac{1}{2}\rho\{v_2^2 - v_1^2\}$$

$$\{p_1-p_2\} = \frac{1}{2}\rho\left[\left(\frac{A_1}{A_2}\right)^2 v_1^2 - v_1^2\right]$$

$$\{p_1-p_2\} = \frac{1}{2}\rho\left[\left(\frac{A_1}{A_2}\right)^2 v_1^2 - v_1^2\right]$$

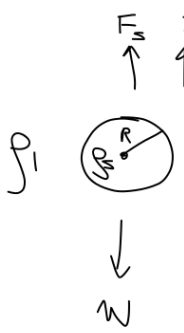
$$= \frac{1}{2}\rho v_1^2\left[\left(\frac{A_1}{A_2}\right)^2 - 1\right]$$

$$= \frac{1}{2}\rho v_1^2\left[\frac{A_1^2 - A_2^2}{A_2}\right]$$

Þannig að án þrengingar helst þrýstingurinn óbreyttur í þessu einfalda líkani

Dæmi 3, (1-14-93)

Fall í vökva, flotkraftur og viðnámskraftur



$$F_s + F_b - W = 0$$

$$6\pi R\eta v_T + V\rho_1 g - V\rho_s g = 0$$

$$V = \frac{4\pi}{3}R^3$$

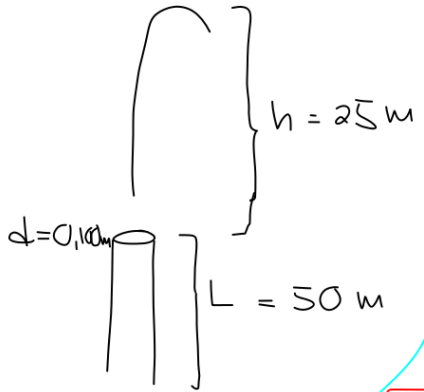
$$6\pi R\eta v_T + \frac{4\pi}{3}R^3\rho_1 g - \frac{4\pi}{3}R^3\rho_s g = 0$$

$$\rightarrow 3\eta v_T + \frac{2}{3}R^2 g\left\{\rho_1 - \rho_2\right\} = 0$$

$$\rightarrow \boxed{v_T = \frac{2R^2 g}{9}\left\{\rho_s - \rho_1\right\}}$$

Dæmi 4, (1-14-100)

Olía spítist upp úr röri. Finna hvort flæðið í rörinu sé jafnt (lagskipt)



$\rho = 900\ kg/m^3$

$\eta = 1{,}00\ \frac{N}{m^2}s$

$$N_R = \frac{2\rho v r}{\eta}$$

Í rörinu er sama hraði og við stútinn (massa varðveisla, ósamþjappanlegur)

$$v = \sqrt{2gh}, \quad r = \frac{d}{2}$$

$$\boxed{N_R = \frac{2 \cdot 900 \cdot \sqrt{2 \cdot 9{,}81 \cdot 25}\ \frac{0{,}1}{2}}{1{,}00}}$$

$$\boxed{\simeq 1993}$$ jafnt flæði