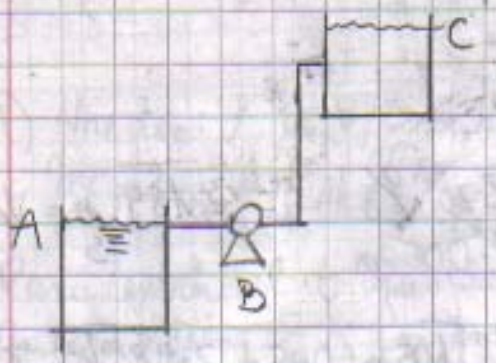

$h_A = 0$
$P_A = 0$ (rel)
$h_C = 3{,}8\ m$
$P_C = 0$
$L = 126\ m$
$D = 0{,}15\ m$
e = pared lisa

Despreciar efecto de las singularidades
$\rho = 975\ Kg/m^3$
$\mu = 1{,}1\ cP$
$H_\epsilon = -5{,}7\ m$
Obtener Fv.

$$H_1 = H_2 + \Delta H_f + H_\epsilon$$

$$H_1 = \cancel{h_1}^{0} + \frac{P_1}{\gamma}^{0} + \frac{V_1^2}{2g}^{0} = 0$$

$$H_2 = \overbrace{h_2}^{3{,}8} + \frac{P_2}{\gamma}^{0} + \frac{V_2^2}{2g}^{0} = 3{,}8\ m$$

$$\Delta H_f = f \frac{L}{D} \frac{V^2}{2g} \rightarrow f \dots \rightarrow Re \rightarrow e/D \rightarrow Re\sqrt{f}$$

$$0 = 3{,}8_m + \Delta H_f - 5{,}7\ m \Rightarrow \Delta H_f = 5{,}7 - 3{,}8 = 1{,}9\ m \quad (1)$$

$$1{,}9\ m = f \cdot \frac{126\ m}{0{,}15\ m} \frac{V^2}{2 \cdot 9{,}8\ m/s^2} = 42{,}8571\ f V^2$$

$$Re\sqrt{f} = \frac{\rho D^{3/2}}{\mu} \sqrt{\frac{2g\Delta H_f}{L}} = \frac{975\ Kg/m^3 \cdot (0{,}15\ m)^{3/2}}{1{,}1 \cdot 10^{-3}\ Kg/m\,s} \sqrt{\frac{2 \cdot 9{,}8\ m/s^2 \cdot 1{,}9\ m}{126\ m}}$$

$$Re\sqrt{f} = 27994{,}2 \approx 2{,}8 \cdot 10^4 \approx 3 \cdot 10^4 \quad (2)$$

$$f = 0{,}0155 \approx 0{,}015 \quad (1)$$

$$Re = \begin{matrix} 2{,}4 \cdot 10^5 \\ 2{,}5 \cdot 10^5 \end{matrix} \quad \begin{matrix} 1 \\ 2 \end{matrix}$$

① $Re = \frac{\rho V D}{\mu} \Rightarrow V = \frac{Re\,\mu}{\rho D} = \frac{2{,}4 \cdot 10^5 \cdot 1{,}1 \cdot 10^{-3}\ kg/(m\,s)}{975\ kg/m^3 \cdot 0{,}15\ m} = 1{,}805\ m/s$ $\quad V = 1{,}88\ m/s$

① $F = V \cdot A = V \cdot \frac{\pi D^2}{4} = 1{,}805\ \frac{m}{s} \cdot \frac{\pi \cdot (0{,}15\ m)^2}{4} = 0{,}0319\ \frac{m^3}{s}$

$$F_1 = 31{,}89 \approx 32\ \frac{l}{s}$$

$F_2 = V_2 \cdot A = 1{,}88\ \frac{m}{s} \cdot \frac{(0{,}15\ m)^2 \pi}{4} = 0{,}0332\ \frac{m^3}{s}$

$$F_2 = 33{,}2\ \frac{l}{s}$$