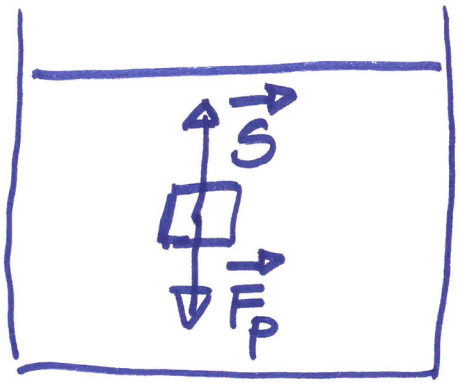


$\vec{S}$ = SPINTA ARCHIMEDE

$\vec{F_p}$ = FORZA PESO

$$\vec{F_p} + \vec{S} = 0$$

$$\vec{F_p} + \vec{S} \neq 0$$

$$F_p > S$$

$$m_c g > m_f g$$

$$\delta_c V_c g > \delta_f V_f g$$

$$\delta = \frac{m}{V}$$

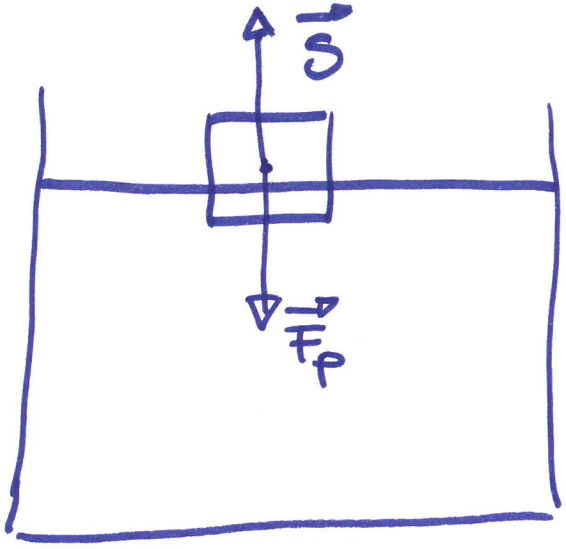
SE IL CORPO È COMPLETAMENTE IMMERSO $V_c = V_f$

$$\delta_c > \delta_f$$

AFFONDA

$F_p < S$ TENDE A SALIRE VERSO LA SUPERFICIE

$\delta_c < \delta_f$



$F_p = S$

$m_c g = m_f g$

$\delta_c V_c g = \delta_f \cdot V_{IMMERSO} \cdot g$

$V_{IMMERSO} = \frac{\delta_c}{\delta_f} \cdot V_c$

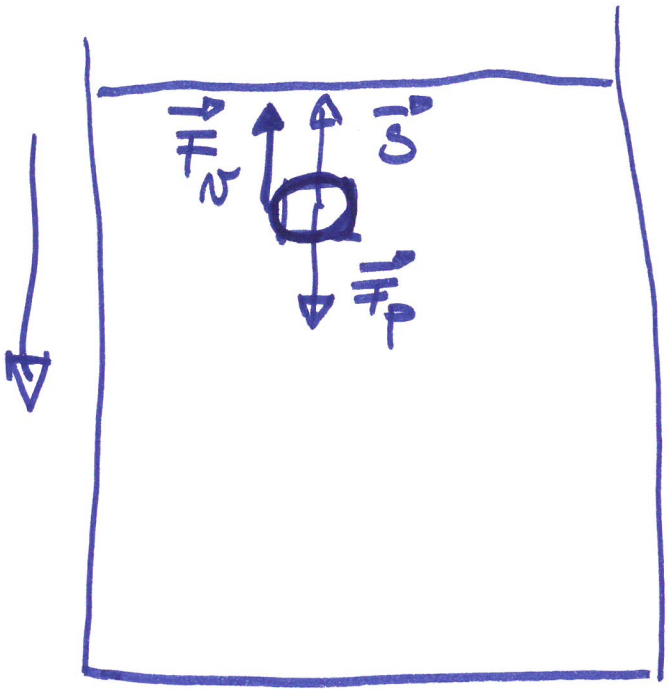
$\delta_{H_2O} = 1 \ g/cm^3$

$\delta_{GHIACCIO} = 0{,}9 \ g/cm^3$

$V_{IMMERSO} = \frac{0{,}9}{1} V_c$

$V_{IMMERSO} = 90\% \cdot V_{CORPO}$ 2

$\rho_c > \rho_f$



$$\vec{F}_v + \vec{F}_p + \vec{S} \neq 0$$

$\vec{F}_v$: VARIA AL VARIARE di v

$\vec{F}_p$, $\vec{S}$: costanti durante il moto

$$F = 6\pi r \eta v$$

$$\vec{F}_v + \vec{F}_p + \vec{S} = 0$$

v costante

VELOCITÀ di SEDIMENTAZIONE

ESERCIZIO 1

$S_P = 70\ cm^2$ $\quad M = 72\ kg$ $\quad S_P = 70 \cdot 10^{-4}\ m^2 = 0{,}70 \cdot 10^{-2}\ m^2$

$S_D = 0{,}70\ m^2$

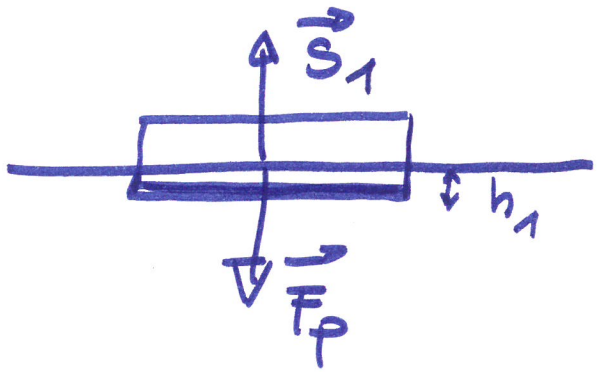
$$p_P = \frac{F_1}{S} = \frac{Mg}{S_P} = \frac{72\ kg \cdot 9{,}81\ m/s^2}{70 \cdot 10^{-4}\ m^2} = 10 \cdot 10^4\ Pa = 10^5\ Pa$$

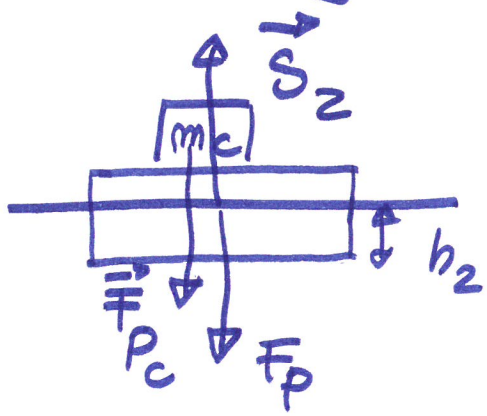
$$(1\ cm)^2 = (10^{-2}\ m)^2 = 10^{-4}\ m^2$$

$$p_D = \frac{Mg}{S_D} = \frac{72\ kg \cdot 9{,}81\ m/s^2}{0{,}70\ m^2} = 10^3\ Pa$$

ESERCIZIO 2

$S = 6\ m^2$ $\quad m_c = 360\ kg$ $\quad \Delta h = h_2 - h_1$





$S_2 > S_1$

$F_p = S_1$

$mg = m_{f_1} g$

$mg = \delta_f V_{IMM_1} g$

$mg = \delta_f S h_1 g$

$m = \delta_f S h_1$

$F_p + F_{pc} = S_2$

$mg + m_c g = m_{f_2} g$

$mg + m_c g = \delta_f S h_2 g$

$m = \delta_f S h_2 - m_c$

$\delta_f S h_1 = \delta_f S h_2 - m_c$

$$m_c = \delta_f S h_2 - \delta_f S h_1$$

$$m_c = \delta_f S (h_2 - h_1)$$

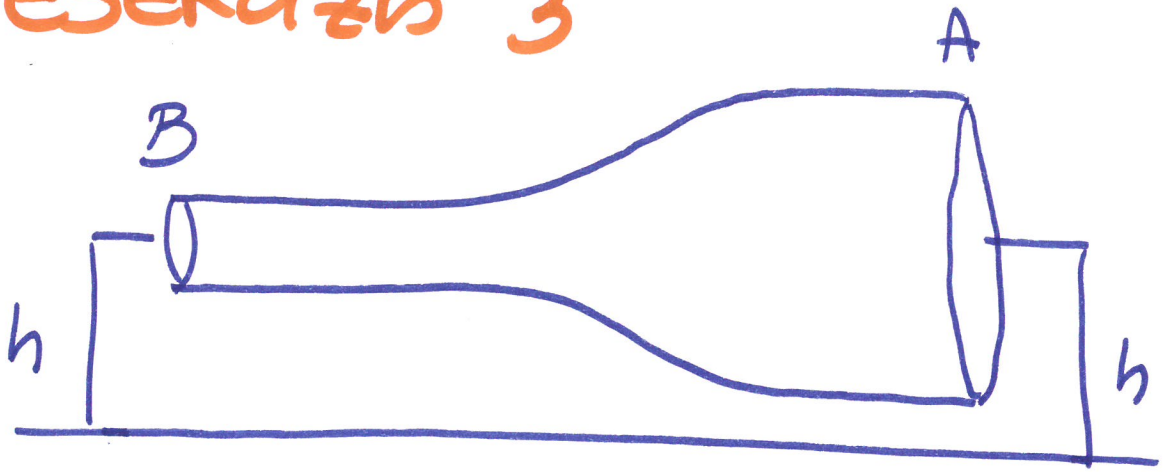
$$\rightarrow h_2 - h_1 = \frac{m_c}{\delta_f \cdot S} = \frac{360\ \cancel{kg}}{10^3\ \frac{kg}{\cancel{m^3}} \cdot 6\ \cancel{m^2}} = 60 \cdot 10^{-3}\ m = 6\ cm$$

$$1\ \frac{g}{cm^3} = 1 \cdot \frac{10^{-3}\ kg}{10^{-6}\ m^3} = 1 \cdot 10^3\ \frac{kg}{m^3}$$

FATTORE di CONVERS.

$$(1\ cm)^3 = (10^{-2}\ m)^3 = 10^{-6}\ m^3$$

ESERCIZIO 3



$v_A = 2{,}9\ m/s$

$P_A = 2{,}5 \cdot 10^5\ Pa$

$r_B = \frac{r_A}{2}$

$P_B = ?$

$$\Delta P_d + \Delta P_g + \Delta P = 0$$

$$\frac{1}{2}\delta v_A^2 + \delta g h_A + P_A = \frac{1}{2}\delta v_B^2 + \delta g h_B + P_B$$

$$h_A - h_B = h$$

$$P_B = \frac{1}{2}\delta v_A^2 + P_A - \frac{1}{2}\delta v_B^2$$

$$\delta_A S_A v_A = \delta_B S_B v_B \qquad \pi r_A^2 \cdot v_A = \pi r_B^2 \cdot v_B$$

$$r_A^2 \cdot v_A = \left(\frac{r_A}{2}\right)^2 v_B$$

$$r_A^2 \, v_A = \frac{r_A^2}{4} \cdot v_B \longrightarrow v_B = 4 v_A$$

$$p_B - p_A + \frac{1}{2}\rho\left(v_A^2 - v_B^2\right)$$

$$p_B = p_A + \frac{1}{2}\rho\left(v_A^2 - (4v_A)^2\right)$$

$$p_B = p_A + \frac{1}{2}\rho\left(-15 v_A^2\right)$$

$$p_B = p_A - \frac{15}{2}\rho v_A^2$$

$$p_B = 2{,}5 \cdot 10^5 \, Pa - \frac{15}{2} \cdot 10^3 \frac{kg}{m^3} \cdot \left(2{,}9 \frac{m}{s}\right)^2$$

$$= 2{,}5 \cdot 10^5 \, Pa - 0{,}63 \cdot 10^5 \frac{kg}{m^3} \cdot \frac{m^2}{s^2} \qquad \frac{N}{m^2} = Pa$$

$$= 1{,}87 \cdot 10^5 \, Pa$$

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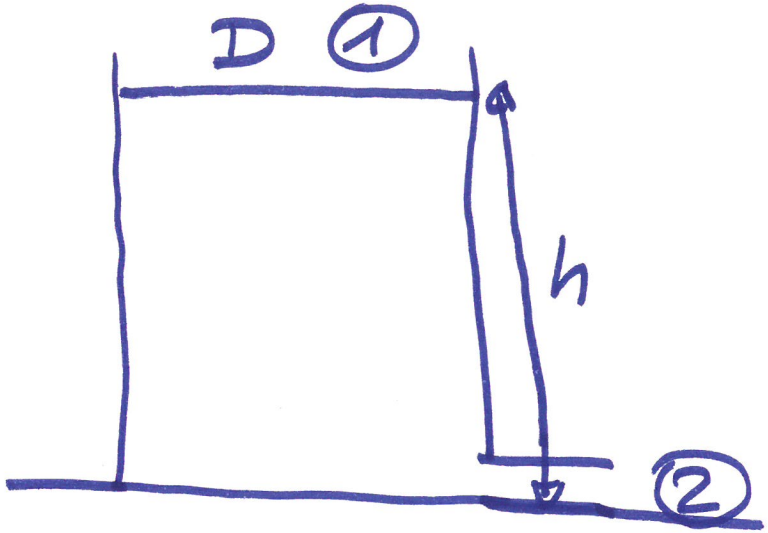


TEOREMA di TORRICELLI

$$v_1 \cong 0$$

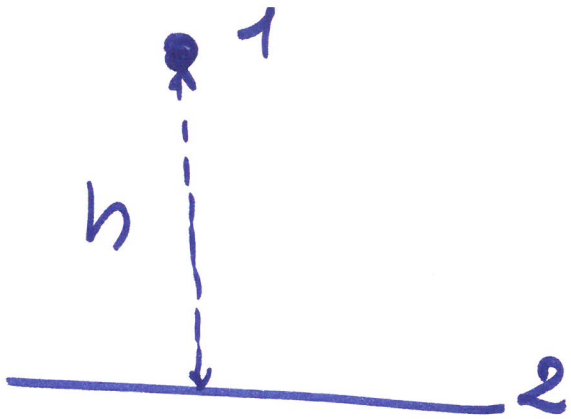
$$P_1 = P_2 = P_0$$

$$\frac{1}{2}\delta v_1^2 + \delta g h_1 + P_1 = \frac{1}{2}\delta v_2^2 + \delta g h_2 + P_2$$

$h_1 = h$ $\qquad$ $h_2 = 0$

$$\delta g h + P_0 = \frac{1}{2}\delta v_2^2 + P_0$$

$$\delta g h = \frac{1}{2}\delta v_2^2 \longrightarrow v_2 = \sqrt{2gh}$$



$$\Delta E_k + \Delta U + \Delta W = 0$$

$$\frac{1}{2} m v_2^2 - \frac{1}{2} m v_1^2 + mgh_2 - mgh_1 = 0$$

$v_1 = 0 \quad h_2 = 0 \quad h_1 = h$

$$\frac{1}{2} m v_2^2 - mgh = 0$$

$$v_2 = \sqrt{2gh}$$