

Gabarito – Hidrologia e Hidráulica
Aplicadas

Capítulo 1

1.2.1 – $E_{\text{total}} = 2,72 \cdot 10^7 \text{ cal}$

1.2.2 - $E_{\text{total}} = 7.79 \cdot 10^5 \text{ cal}$

1.2.3 - $E_{\text{total}} = 7,57 \cdot 10^4 \text{ cal}$

1.2.4 – $P = 0,777 \text{ atm}$

1.2.5 – $t = 3740 \text{ s} = 62,3 \text{ min}$

1.2.6 – $T = 40,8 \text{ }^\circ\text{F}$

1.3.1 – $\text{Vol} = 8,32 \cdot 10^{-2} \text{ m}^3$

1.3.2 - $\gamma = \rho \cdot g$

1.3.3 - $\gamma = 133 \text{ kN/m}^3 / \gamma_R = 13,6 \text{ (Hg)}$

1.3.4 – $F = 1,47 \cdot 10^4 \text{ lbf}$

1.3.5 – $P = 1310 \text{ N}$

1.3.6 – $P = 8,31 \text{ lbf} / \gamma_R = 0,994$

1.3.7 – $\text{Vol}_2 = 104,4 \text{ m}^3$

1.3.8 – $0,2248 \text{ lb}$

1.3.9 – $7,376 \cdot 10^{-1} \text{ pé.lb}$

1.4.1 – $[\mu(\text{ar})/\mu(\text{água})]_{20^\circ\text{C}} = 1,813 \cdot 10^{-2} /$

$[\mu(\text{ar})/\mu(\text{água})]_{80^\circ\text{C}} = 5,90 \cdot 10^{-2} /$

$[\nu(\text{ar})/\nu(\text{água})]_{20^\circ\text{C}} = 15,04 /$

$[\nu(\text{ar})/\nu(\text{água})]_{80^\circ\text{C}} = 57,3$

1.4.2 - $\mu(\text{água})_{20^\circ\text{C}} = 2,092 \cdot 10^{-5} \text{ lb.s/pé}^2$

$\nu(\text{água})_{20^\circ\text{C}} = 1,08 \cdot 10^{-5} \text{ pé}^2/\text{s}$

1.4.3 a) $1 \text{ lb.s/pé}^2 = 478,9 \text{ P}$

b) $1 \text{ pé/s} = 929,4 \text{ stoke}$

1.4.4 – $F = 0,125 \text{ lbf}$

1.4.5 –

$\gamma = 0 \text{ ft}; \tau = -9,00 \text{ N/m}^2$

$\gamma = 1/12 \text{ ft}; \tau = 0 \text{ N/m}^2$

$\gamma = 1/6 \text{ ft}; \tau = 9,00 \text{ N/m}^2$

$\gamma = 1/4 \text{ ft}; \tau = 18,00 \text{ N/m}^2$

$\gamma = 1/3 \text{ ft}; \tau = 27,00 \text{ N/m}^2$

1.4.6 - $\Delta y = 2,12 \cdot 10^{-4} \text{ m}$

1.4.7 – $v = 4,57 \cdot 10^{-3} \text{ pé/s}$

1.4.8 – $F = 0,624 \text{ lbf}$

1.4.9 - $\mu = 3,65 \cdot 10^{-1} \text{ N.s/m}^2$

1.4.10 – $\text{Torque} = 32,7 \text{ N.m}$

1.5.1 – $h = 3,0 \text{ cm}, D = 0,0971 \text{ cm}$

$h = 2,0 \text{ cm}, D = 0,146 \text{ cm}$

$h = 1,0 \text{ cm}, D = 0,291 \text{ cm}$

1.5.3 - $\sigma = 1,61 \cdot 10^{-3} \text{ lb/pé}$

1.5.4 – $h = 0,662 \text{ cm}$

1.5.5 – $h_2 = 1,204 \text{ m}$ (20% aumento)

1.6.1 – $E_b = 9,09 \cdot 10^9 \text{ N/m}^2$

1.6.2 - $\Delta\rho/\rho = -0,093\%$

1.6.3 - $\rho = 1,95 \text{ slug/pé}^3$

1.6.4 - $\Delta\text{Vol} = -4,33 \text{ m}^3$ (entra no tubo)