

# Formulario Hidráulica (1)

## Física II

20/9/2016

Unidades de la fuerza  $1 \text{ Kgf} = 9.8 \text{ N} = 9.8 \frac{\text{Kg m}}{\text{s}^2} = 980,000 \text{ dinas}$

- Peso de un objeto

$$P = m g$$

$$1 \text{ kg} \frac{\text{m}}{\text{s}^2} = 1 \text{ N}$$

$$g = -9.8 \frac{\text{m}}{\text{s}^2}$$

$$g = -32.0 \frac{\text{ft}}{\text{s}^2}$$

- Estado liquido

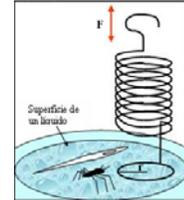
Densidad  $\rho = \frac{m}{V} \quad [=] \quad \frac{\text{Kg}}{\text{m}^3}$

Peso específico  $\gamma = \frac{P}{V} \quad [=] \quad \frac{\text{Kgf}}{\text{m}^3} \text{ ó } \frac{\text{N}}{\text{m}^3} \text{ ó } \frac{\text{gf}}{\text{cm}^3}$

$$P_e = \gamma = \rho g$$

- Tensión superficial

$$\tau = \frac{F}{2 \pi r} \quad [=] \quad \frac{\text{N}}{\text{m}}$$



- viscosidad dinámica

$$\mu = \frac{E}{d\theta/dt} \quad \frac{\text{Kg}}{\text{m s}} = 10 \text{ Poises}$$

- viscosidad cinemática

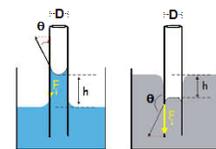
$$\nu = \frac{\mu}{\rho} \quad [=] \quad \frac{\text{m}^2}{\text{s}}$$

- Presión

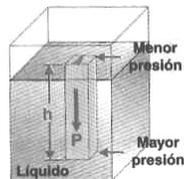
$$P = \frac{F}{A}$$

- Capilaridad

$$h = \frac{4 \tau \cos \theta}{P_e D}$$



- Presión hidrostática



$$P = P_e h \quad [=] \quad \frac{\text{N}}{\text{m}^2} = 1 \text{ Pascal}$$

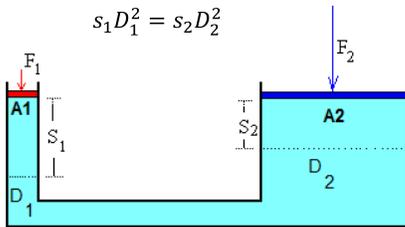
$$P = \rho g h \quad \text{ó } \frac{\text{Kgf}}{\text{m}^2} \text{ ó } \frac{\text{gf}}{\text{cm}^2}$$

- Principio de Pascal y Prensa hidráulica

$$P_1 = P_2$$

$$\frac{F_1}{A_1} = \frac{F_2}{A_2}$$

$$s_1 D_1^2 = s_2 D_2^2$$



- Fuerzas en las caras laterales

$$F = P_e A \left[ \frac{h}{2} \right] = \rho g A \left[ \frac{h}{2} \right] \quad [=] \quad \text{N}$$

- Diferencia de presiones

$$P_2 - P_1 = \gamma (h_2 - h_1)$$

- Fuerza en la cara del fondo

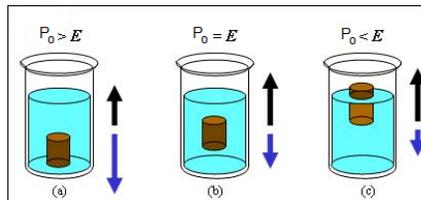
$$F = P_e A h = \rho g A h \quad [=] \quad \text{N}$$



- Principio de Arquímedes

$$E = \gamma_L V_d = \rho_L g V_d$$

$$V_s = V_d$$



$E$  =Empuje

$\gamma_L$  =Peso esp. Del liquido

$V_o$  =Volumen del objeto

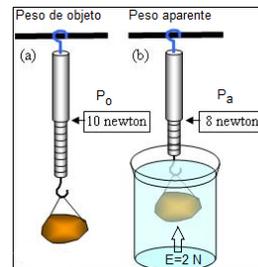
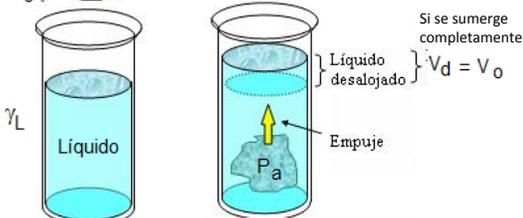
$\gamma_o$  =Peso esp. del objeto

$P_o$  =Peso del objeto

$V_s$  =Volumen sumergido

$P_a$  =Peso aparente del objeto

$P_o = \gamma_o V_o$



$$P_a = P_o - E$$