

Tryck

Olika Standardenheter

$$1 \text{ N/m}^2 = 1 \text{ Pa}$$

$$1 \text{ bar} = 10^5 \text{ Pa}$$

$$760 \text{ mm Hg} = 1,013 \cdot 10^5 \text{ Pa} = 1,013 \text{ bar}$$

$$1 \text{ atm} = 760 \text{ mm Hg}$$

$$1 \text{ at} = 1 \text{ kp/cm}^2 = 0,98 \cdot 10^5 \text{ Pa}$$

at:

teknisk
atmosfärTrycket i ett bildäck

2,5 kilos tryck syftar på kp/cm^2
OBS! $1 \text{ kg} = 1 \text{ kp}$

2,5 kp/cm^2 omvandlat till Pa :

$$\Rightarrow 2,5 \cdot 0,98 \cdot 10^5 \text{ Pa} = 2,45 \cdot 10^5 \text{ Pa} = 2,45 \text{ bar}$$

Vilken skala används på tryckmätaren?

Enheter:

$$2,5 \text{ kp/cm}^2$$

$$2,45 \text{ bar}$$

$$245 \text{ kg Pa}$$

$$\text{Psi} : \sim 35$$

$$1 \text{ psi} = 6,894 \cdot 10^3 \text{ Pa}$$

$$1 \text{ Pa} = 145,04 \cdot 10^{-6} \text{ Psi}$$

NTP: Normal Temperature Pressure

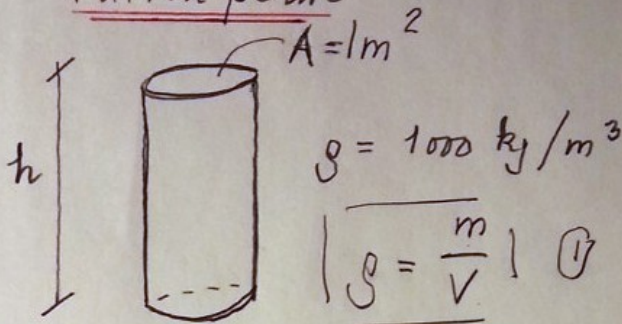
$$0^\circ \text{C} =$$

$$1 \text{ atm} =$$

$$273,15 \text{ K}$$

$$1,01325 \text{ Pa}$$

Vatten pelare



Rätt svar

$$1 \text{ atm} = 10,34 \text{ mvp}$$

$$1 \text{ at} = 10 \text{ mvp}$$

$$\rho = 1000 \text{ kg/m}^3$$

$$\rho = \frac{m}{V} \quad (1)$$

$$h = 10 \text{ m} \quad \downarrow \text{mg} \quad | \quad F = mg \quad | \quad (2) \quad [N = \frac{\text{kg} \cdot \text{m}}{\text{s}^2}]$$

$$g = 9,81 \frac{\text{m}}{\text{s}^2} \quad | \quad V = A \cdot h \quad | \quad (3)$$

(1) ger $m = \rho \cdot V$ ekv (3) insatt i (1) \Rightarrow

$$m = \rho \cdot A \cdot h \quad \text{och in i ekv (2)}$$

$$F = \rho \cdot A \cdot h \cdot g$$

OBS! atö dvs i vatten var 10:e meter djup

Vilket tryck blir det från pelaren på golvet

$$p = \frac{\rho \cdot A \cdot h \cdot g}{A} = \rho \cdot h \cdot g$$

\therefore Oberoende av A

Dimensionsanalys ger med SI-enheter

$$p = \left[\frac{\text{kg} \cdot \text{m} \cdot \text{m}}{\text{m}^3 \cdot \text{s}^2} \right] = \left[\frac{\text{kgm}}{\text{s}^2 \cdot \text{m}^2} \right]$$

$$p = \left[\frac{\text{N}}{\text{m}^2} \right]$$

med $h = 10 \text{ m}$

$$p = 1000 \cdot 10 \cdot 9,81 = 9,81 \cdot 10^4 = 0,98 \cdot 10^5 \frac{\text{N}}{\text{m}^2} \text{ (Pa)}$$

$$= 1 \text{ at}$$

Hg: Kvick-silver Normalt tryck 760 mm Hg

$$\text{Extra } \rho_{\text{Hg}} = 13579 \text{ kg/m}^3 \Rightarrow (760 \text{ mm Hg})$$

$$p = 13579 \cdot 0,760 \cdot 9,81 = 101240 \frac{\text{N}}{\text{m}^2} = 1,012 \cdot 10^5 \frac{\text{N}}{\text{m}^2}$$