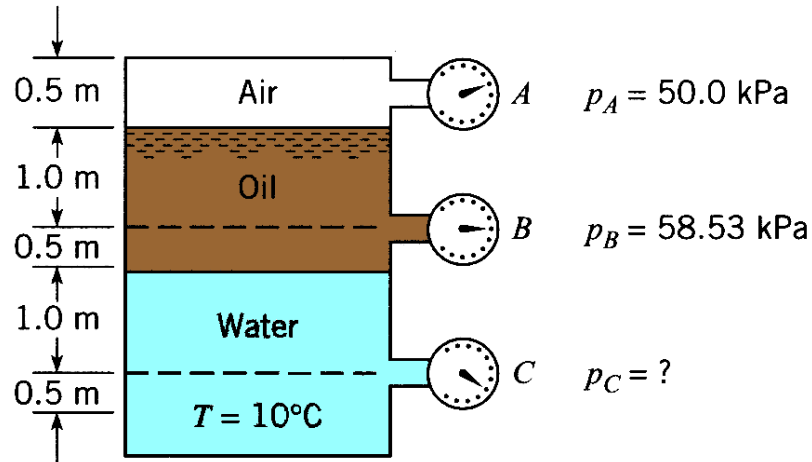


HYDROSTATICS

EXAMPLE PROBLEM: Using the hydrostatic eq. for multiple liquids

For the closed tank with Bourdon-tube gages tapped into it, find:

- (a) the specific gravity of the oil
- (b) the pressure reading on gage C.



SOLUTION

Let's start at the top (point A) where the pressure is known and work our way down:

$$p_B \cong p_A + g_{OIL}(1)$$

The aerostatic pressure $g_{AIR}(0.5)$ is neglected because $g_{AIR} \ll g_{LIQUID}$

Solving for the specific weight of the oil:

$$g_{OIL} = p_B - p_A = 8,530 \text{ N/m}^3$$

$$S_{OIL} = \frac{g_{OIL}}{g_{H_2O}} = \frac{8,530}{9,810} = 0.8$$

Finally, moving from B to C:

$$p_C = p_B + g_{OIL}(0.5) + g_{H_2O}(1) = 58,530 + 8,530(0.5) + 9,810(1) = 72.605 \text{ kPa}$$