Example of piezometric pressure inside standing fluids

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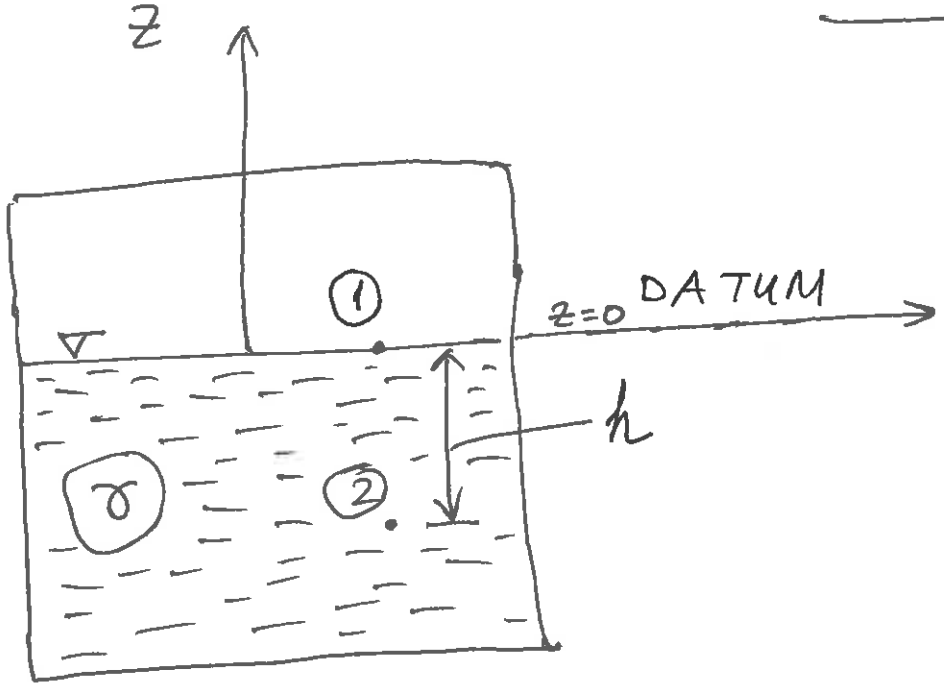

From hydrostatic Law:

$$P_2 = P_1 + \gamma h$$

(P_z = (Piezometric pressure) = $p + \gamma z$ ⇐ DEFINITION)

$$P_{z_1} = P_1 + \gamma z_1 = P_1 + \gamma \cdot 0 \quad (z_1 = 0)$$

$$P_{z_2} = P_2 + \gamma z_2 = (P_1 + \gamma h) + \gamma(-h) \quad (z_2 = -h)$$

$$= P_1$$

SO: $\boxed{P_{z_1} = P_{z_2}}$

→ true throughout the whole fluid or P_z = constant

Note: I left $P_1 \neq 0$ in case there is another liquid or air above the shown free surface.