

SOLUTION

$$\frac{V}{V_0} = \left(1 + \frac{P}{\alpha K_w}\right)^{\alpha}$$

$$\Rightarrow \frac{0.989}{1} = \left[1 + \frac{P}{0.13986 \times 2.196 \times 10^9}\right]^{0.13986}$$

$$\Rightarrow P = -0.02335 \times 10^9 \text{ Pa}$$

$$\Rightarrow |P| = +2.335 \times 10^7 \text{ Pa} \quad (\text{-ve sign shows decrease in volume so neglected})$$

$$\Rightarrow P = +2.34 \times 10^7 \text{ N/m}^2$$

$$= +\underline{\underline{3.39 \times 10^3 \text{ psi or lb/in}^2}}$$

(b) let. $K_{eff} = h_m$

$$P = \frac{F}{A} \Rightarrow 2.34 \times 10^7 = \frac{mg}{A}$$

$$\Rightarrow 2.34 \times 10^7 = \frac{h \times A \times d \times g}{A}$$

$$\Rightarrow h = \frac{2.34 \times 10^7}{7.86 \times 10^3 \times 9.8} = 3.04 \times 10^2 \text{ m}$$
$$= \underline{\underline{9.97 \times 10^2 \text{ ft}}}$$

(c) $m = \frac{PA}{g} = \frac{2.34 \times 10^7 \times 10^{-2}}{9.8}$

$$= 2.39 \times 10^4 \text{ kg}$$

$$= \underline{\underline{5.26 \times 10^4 \text{ pounds}}}$$