

## Problem 1.24

[Difficulty: 1]

**1.24** Express the following in BG units:

- (a)  $50 \text{ m}^2$
- (b)  $250 \text{ cc}$
- (c)  $100 \text{ kW}$
- (d)  $5 \text{ kg/m}^2$

**Given:** Quantities in SI (or other) units.

**Find:** Quantities in BG units.

**Solution:** Use Table G.2.

$$(a) \quad 50 \text{ m}^2 = 50 \text{ m}^2 \times \left( \frac{1 \cdot \text{in}}{0.0254 \text{ m}} \times \frac{1 \cdot \text{ft}}{12 \cdot \text{in}} \right)^2 = 538 \text{ ft}^2$$

$$(b) \quad 250 \text{ cc} = 250 \text{ cm}^3 \times \left( \frac{1 \cdot \text{m}}{100 \text{ cm}} \times \frac{1 \cdot \text{in}}{0.0254 \text{ m}} \times \frac{1 \cdot \text{ft}}{12 \cdot \text{in}} \right)^3 = 8.83 \times 10^{-3} \cdot \text{ft}^3$$

$$(c) \quad 100 \text{ kW} = 100 \text{ kW} \times \frac{1000 \text{ W}}{1 \cdot \text{kW}} \times \frac{1 \cdot \text{hp}}{746 \text{ W}} = 134 \text{ hp}$$

$$(d) \quad 5 \cdot \frac{\text{kg}}{\text{m}^2} = 5 \cdot \frac{\text{kg}}{\text{m}^2} \times \left( \frac{0.0254 \text{ m}}{1 \cdot \text{in}} \times \frac{12 \cdot \text{in}}{1 \cdot \text{ft}} \right)^2 \times \frac{1 \cdot \text{slug}}{14.95 \text{ kg}} = 0.0318 \frac{\text{slug}}{\text{ft}^2}$$