

Problem 1.25

[Difficulty: 1]

1.25 Express the following in BG units:

- (a) 180 cc/min
- (b) 300 kW · hr
- (c) 50 N · s/m²
- (d) 40 m² · hr

Given: Quantities in SI (or other) units.

Find: Quantities in BG units.

Solution: Use Table G.2.

$$(a) \quad 180 \text{ cc} = 180 \text{ cm}^3 \times \left(\frac{1 \text{ m}}{100 \text{ cm}} \times \frac{1 \text{ in}}{0.0254 \text{ m}} \times \frac{1 \text{ ft}}{12 \text{ in}} \right)^3 = 6.36 \times 10^{-3} \text{ ft}^3$$

$$(b) \quad 300 \text{ kW} = 300 \text{ kW} \times \frac{1000 \text{ W}}{1 \text{ kW}} \times \frac{1 \text{ hp}}{746 \text{ W}} = 402 \text{ hp}$$

$$(c) \quad 50 \frac{\text{N} \cdot \text{s}}{\text{m}^2} = 50 \frac{\text{N} \cdot \text{s}}{\text{m}^2} \times \frac{1 \text{ lbf}}{4.448 \text{ N}} \times \left(\frac{0.0254 \text{ m}}{1 \text{ in}} \times \frac{12 \text{ in}}{1 \text{ ft}} \right)^2 = 1.044 \frac{\text{lbf} \cdot \text{s}}{\text{ft}^2}$$

$$(d) \quad 40 \text{ m}^2 \cdot \text{hr} = 40 \text{ m}^2 \times \left(\frac{1 \text{ in}}{0.0254 \text{ m}} \times \frac{1 \text{ ft}}{12 \text{ in}} \right)^2 \cdot \text{hr} = 431 \text{ ft}^2 \cdot \text{hr}$$