

Problem 1-4

Convert: (a) 200 lb · ft to N · m, (b) 350 lb/ft³ to kN/m³, (c) 8 ft/h to mm/s. Express the result to three significant figures. Use an appropriate prefix.

Solution**Part (a)**

$$200 \cancel{\text{lb}} \cdot \cancel{\text{ft}} \times \frac{4.448 \text{ N}}{1 \cancel{\text{lb}}} \times \frac{1 \text{ m}}{3.28 \cancel{\text{ft}}} \approx 271 \text{ N} \cdot \text{m}$$

Part (b)

$$350 \frac{\cancel{\text{lb}}}{\cancel{\text{ft}}^3} \times \frac{4.448 \text{ N}}{1 \cancel{\text{lb}}} \times \frac{1 \text{ kN}}{1000 \text{ N}} \times \left(\frac{3.28 \cancel{\text{ft}}}{1 \text{ m}} \right)^3 \approx 54.9 \frac{\text{kN}}{\text{m}^3}$$

Part (c)

$$8 \frac{\cancel{\text{ft}}}{\cancel{\text{h}}} \times \frac{1 \cancel{\text{m}}}{3.28 \cancel{\text{ft}}} \times \frac{1000 \text{ mm}}{1 \cancel{\text{m}}} \times \frac{1 \cancel{\text{h}}}{60 \cancel{\text{min}}} \times \frac{1 \cancel{\text{min}}}{60 \text{ s}} \approx 0.678 \frac{\text{mm}}{\text{s}}$$