

Energy Management Certification

UNIT EQUIVALENTS (CONVERSION FACTORS)

To change from one set of units to another, multiply known quantity and unit by the ratio of unit equivalents that result in the desired units.

*Additional Unit Equivalents can be found on [page 550](#) of *Principals of Heating, Ventilating and Air Conditioning, 6th Edition*.*

LENGTH

$$\begin{aligned} 12 \text{ inch} &= 1 \text{ ft} = 0.333 \text{ yd} \\ 1 \text{ m} &= 100 \text{ cm} \\ &= 1000 \text{ mm} \end{aligned}$$

AREA

$$\begin{aligned} 144 \text{ in}^2 &= 1 \text{ ft}^2 \\ 1 \text{ ft}^2 &= 0.093 \text{ m}^2 \end{aligned}$$

VOLUME

$$\begin{aligned} 1728 \text{ in}^3 &= 1 \text{ ft}^3 = 7.48 \text{ gal} \\ 1 \text{ ft}^3 &= 0.0283 \text{ m}^3 \end{aligned}$$

MASS

$$\begin{aligned} 1 \text{ lb} &= 16 \text{ oz} \\ 1 \text{ kg} &= 1000 \text{ g} \\ 2.2 \text{ lb} &= 1 \text{ kg} \end{aligned}$$

PRESSURE

$$\begin{aligned} 1 \text{ psi} &= 2.3 \text{ ft w.} = 2.04 \text{ in. Hg} \\ 14.7 \text{ psi} &= 1 \text{ atm} \end{aligned}$$

ENERGY

$$\begin{aligned} 1 \text{ Btu} &= 778 \text{ ft-lb} \\ 1 \text{ Btu} &= 252 \text{ calorie} \end{aligned}$$

POWER (RATE OF ENERGY)

$$\begin{aligned} 2545 \text{ Btu/hr} &= 1 \text{ Hp} \\ 1 \text{ Hp} &= 0.746 \text{ Kw} = 33,000 \text{ ft-lb/min} \\ 3410 \text{ Btu/hr} &= 1 \text{ Kw} \\ 12,000 \text{ Btu/hr} &= 1 \text{ Ton of Refrigeration} \\ 1 \text{ Ton Refrig.} &= 3.52 \text{ Kw} = 4.72 \text{ Hp} \end{aligned}$$

SPECIFIC HEAT

$$1 \text{ Btu/lb-degF} = 1 \text{ cal/gm degC}$$

APPROXIMATE EQUIVALENTS FOR WATER AT 60 degF

$$\begin{aligned} \text{Density: } 8.33 \text{ lb} &= 1 \text{ gallon} \\ 62.4 \text{ lb} &= 1 \text{ ft}^3 \\ \text{Flow Rate: } 1 \text{ Gpm} &= 500 \text{ lb/hr} \end{aligned}$$