

# Unit Conversion Factors

Quantity	Equivalent Values
Mass	1 kg = 1000 g = 0.001 metric ton = 2.20462 lb <sub>m</sub> = 35.27392 oz 1 lb <sub>m</sub> = 16 oz = 5 × 10 <sup>-4</sup> ton = 453.593 g = 0.453593 kg
Length	1 m = 100 cm = 1000 mm = 10 <sup>6</sup> μm = 10 <sup>10</sup> Å 1 m = 39.37 in = 3.2808 ft = 1.0936 yd = 0.0006214 mile 1 ft = 12 in = 1/3 yd = 0.3048 m = 30.48 cm
Volume	1 m <sup>3</sup> = 1000 liters = 10 <sup>6</sup> cm <sup>3</sup> = 10 <sup>6</sup> ml 1 m <sup>3</sup> = 35.3145 ft <sup>3</sup> = 220.83 imperial gallons = 264.17 gal = 1056.68 qt 1 ft <sup>3</sup> = 1728 in <sup>3</sup> = 7.4805 gal = 0.028317 m <sup>3</sup> = 28.317 liters = 28317 cm <sup>3</sup>
Force	1 N = 1 kg·m/s <sup>2</sup> = 10 <sup>5</sup> dynes = 10 <sup>5</sup> g·cm/s <sup>2</sup> = 0.22481 lb <sub>f</sub> 1 lb <sub>f</sub> = 32.174 lb <sub>m</sub> ·ft/s <sup>2</sup> = 4.4482 N
Pressure	1 atm = 1.01325 × 10 <sup>5</sup> N/m <sup>2</sup> (Pa) = 101.325 kPa = 1.01325 bars 1 atm = 1.01325 × 10 <sup>6</sup> dynes/cm <sup>2</sup> 1 atm = 760 mmHg at 0°C (torr) = 10.333 m H <sub>2</sub> O at 4°C = 14.696 lb <sub>f</sub> /in <sup>2</sup> (psi) 1 atm = 33.9 ft H <sub>2</sub> O at 4°C = 29.921 inHg at 0°C
Energy	1 J = 1 N·m = 10 <sup>7</sup> ergs = 10 <sup>7</sup> dyne·cm = 2.778 × 10 <sup>-7</sup> kW·h 1 J = 0.23901 cal = 0.7376 ft·lb <sub>f</sub> = 9.486 × 10 <sup>-4</sup> Btu
Power	1 W = 1 J/s = 1.341 × 10 <sup>-3</sup> hp

Ideal Gas Constant:

$$\frac{8.31434 \text{ kJ}}{\text{kmol}\cdot\text{K}} \quad \frac{8.31434 \text{ kPa}\cdot\text{m}^3}{\text{kmol}\cdot\text{K}} \quad \frac{0.0831434 \text{ bar}\cdot\text{m}^3}{\text{kmol}\cdot\text{K}}$$

$$\frac{82.05 \text{ L}\cdot\text{atm}}{\text{kmol}\cdot\text{K}} \quad \frac{1.9858 \text{ Btu}}{\text{lbmol}\cdot\text{R}} \quad \frac{1545.35 \text{ ft}\cdot\text{lb}_f}{\text{lbmol}\cdot\text{R}}$$

$$\frac{10.73 \text{ psia}\cdot\text{ft}^3}{\text{lbmol}\cdot\text{R}} \quad \frac{62.36 \text{ liter}\cdot\text{torr}}{\text{mol}\cdot\text{K}} \quad \frac{0.7302 \text{ ft}^3\cdot\text{atm}}{\text{lbmol}\cdot\text{R}}$$

Temperature Conversions:

$$T(\text{K}) = T(^{\circ}\text{C}) + 273.15$$

$$T(^{\circ}\text{R}) = T(^{\circ}\text{F}) + 459.67$$

$$T(^{\circ}\text{R}) = 1.8T(\text{K})$$

$$T(^{\circ}\text{F}) = 1.8T(^{\circ}\text{C}) + 32$$