

# CONVERSION FACTORS

Prefixes for SI Units	Symbol = Prefix	Factor by which unit is multiplied
		T = tera
	G = giga	$10^9$
	M = mega	$10^6$
	k = kilo	$10^3$
	h = hecto	$10^2$
	da = deka	10
	d = deci	$10^{-1}$
	c = centi	$10^{-2}$
	m = milli	$10^{-3}$
	$\mu$ = micro	$10^{-6}$
	n = nano	$10^{-9}$
	p = pico	$10^{-12}$
	f = femto	$10^{-15}$
	a = atto	$10^{-18}$
<b>Mass</b>	1 kg = 2.2046 lb <sub>m</sub> 1 g = 2.2046 x 10 <sup>-3</sup> lb <sub>m</sub> 1 slug = 14.59 kg	1 lb <sub>m</sub> = 0.4536 kg 1 lb <sub>m</sub> = 453.6 g 1 kg = 0.06852 kg
<b>Density</b>	1 kg / m <sup>3</sup> = 0.0624 lb <sub>m</sub> / ft <sup>3</sup> 1 g / cm <sup>3</sup> = 62.4 lb <sub>m</sub> / ft <sup>3</sup> 1 g / cm <sup>3</sup> = 0.0361 lb <sub>m</sub> / in <sup>3</sup> 1 slug / ft <sup>3</sup> = 515.4 kg / m <sup>3</sup>	1 lb <sub>m</sub> / ft <sup>3</sup> = 16.02 kg / m <sup>3</sup> 1 lb <sub>m</sub> / ft <sup>3</sup> = 1.602 x 10 <sup>-2</sup> g / cm <sup>3</sup> 1 lb <sub>m</sub> / in <sup>3</sup> = 27.7 g / cm <sup>3</sup> 1 kg / m <sup>3</sup> = 0.00194 slug / ft <sup>3</sup>
<b>Length</b>	1 mm = 0.03937 in 1 m = 3.2808 ft	1 in = 25.4 mm 1 ft = 0.3048 m
<b>Velocity</b>	1 m / s = 3.281 ft / s 1 km / h = 0.9113 ft / s 1 km / h = 0.62137 mile / h	1 ft / s = 0.3048 m / s 1 ft / s = 1.097 km / h 1 mile / h = 1.6093 km / h
<b>Volume</b>	1 m <sup>3</sup> = 1000 liters 1 m <sup>3</sup> = 61,020 in <sup>3</sup> 1 m <sup>3</sup> = 35.31 ft <sup>3</sup> 1 m <sup>3</sup> = 264.2 gal 1 gal = 231.0 in <sup>3</sup> 1 gal = 0.1337 ft <sup>3</sup> 1 in <sup>3</sup> = 578 x 10 <sup>-6</sup> ft <sup>3</sup>	1 liter = 0.001m <sup>3</sup> 1 in <sup>3</sup> = 16.39 x 10 <sup>-6</sup> m <sup>3</sup> 1 ft <sup>3</sup> = 0.02832 m <sup>3</sup> 1 gal = 0.003785 m <sup>3</sup> 1 in <sup>3</sup> = 0.004329 gal 1 ft <sup>3</sup> = 7.481 gal 1 ft <sup>3</sup> = 1728 in <sup>3</sup>
<b>Flow Rate</b>	1 gal / min = 0.06309 liters / s 1 gal / min = 0.002228 ft <sup>3</sup> / s 1 liter / s = 0.03531 ft <sup>3</sup> / s	1 liter / s = 15.85 gal / min 1 ft <sup>3</sup> / s = 448.8 gal / min 1 ft <sup>3</sup> / s = 28.32 liters / s
<b>Force</b>	1 N = 1 kg · m / s <sup>2</sup> 1 N = 10 <sup>5</sup> dynes 1 N = 0.22481 lb <sub>f</sub>	1 kip = 1000 lb <sub>f</sub> 1 lb <sub>f</sub> = 32.174 lb <sub>m</sub> · ft / s <sup>2</sup> 1 dyne = 10 <sup>-5</sup> N 1 lb <sub>f</sub> = 4.4482 N

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<b>Energy</b>	1 J = 1 N · m	1 Btu = 778.17 ft · lb <sub>f</sub>
	1 J = 0.73756 ft · lb <sub>f</sub>	1 ft · lb <sub>f</sub> = 1.35582 J
	1 kJ = 0.9478 Btu	1 Btu = 1.0551 kJ
		1 kcal = 4.1868 kJ
<b>Pressure</b>	1 Pa = 1 N / m <sup>2</sup>	1 ksi = 1000 lb <sub>f</sub> / in <sup>2</sup>
	1 bar = 10 <sup>5</sup> N / m <sup>2</sup>	1 lb <sub>f</sub> / in <sup>2</sup> = 144 lb <sub>f</sub> / ft <sup>2</sup>
	1 Pa = 1.4504 x 10 <sup>-4</sup> lb <sub>f</sub> / in <sup>2</sup>	1 lb <sub>f</sub> / in <sup>2</sup> = 6894.8 Pa
	1 MPa = 145 lb <sub>f</sub> / in <sup>2</sup>	1 lb <sub>f</sub> / in <sup>2</sup> = 6.90 x 10 <sup>-3</sup> MPa
	1 atm = 1.01325 bar	1 atm = 14.696 lb <sub>f</sub> / in <sup>2</sup>
<b>Power</b>	1 W = 1 J / s	1 hp = 2545 Btu / h
	1 W = 3.413 Btu / h	1 Btu / h = 0.293 W
	1 kW = 1.341 hp	1 hp = 0.7457 kW
		1 hp = 550 ft · lb <sub>f</sub> / s
<b>Temp.</b>	T(K) = 273.15 + T(°C)	T(°C) = T(K) - 273.15
	T(K) = 5/9[T(°F) - 32] + 273.15	T(°F) = 9/5[T(K) - 273] + 32
	T(°C) = 5/9[T(°F) - 32]	T(°F) = 9/5[T(°C)] + 32
	T(°R) = 459.67 + T(°F)	T(°F) = T(°R) - 459.67
<b>Specific Heat</b>	1 kJ / kg · K = 0.238846 Btu / lb <sub>m</sub> · °R	1 Btu / lb <sub>m</sub> · °R = 4.1868 kJ / kg · K
	1 kcal / kg · K = 1 Btu / lb <sub>m</sub> · °R	
<b>Thermal Conductivity</b>	1 W / m · K = 2.39 x 10 <sup>-3</sup> cal / cm · s · K	1 cal / cm · s · K = 418.4 W / m · K
	1 W / m · K = 0.578 Btu / ft · h · °F	1 Btu / ft · h · °F = 1.730 W / m · K
	1 cal / cm · s · K = 241.8 Btu / ft · h · °F	1 Btu / ft · h · °F = 4.136 x 10 <sup>-3</sup> cal / cm · s · K
<b>Universal Gas Constant</b>		R = 8.314 kJ / kmol · K
		R = 1545 ft · lb <sub>f</sub> / lbmol · °R
		R = 1.986 Btu / lbmol · °R
<b>Standard Acceleration of Gravity</b>		g = 9.80665 m / s <sup>2</sup>
		g = 32.174 ft / s <sup>2</sup>
<b>Standard Atmospheric Pressure</b>		1 atm = 1.01325 bars
		1 atm = 14.696 lb <sub>f</sub> / in <sup>2</sup>