

## Engineering Unit Conversion Factors

### How to Use This Table - Example Unit Conversions

If you are given a measurement from the left hand side and want to convert to the units on the right hand side, just multiply your number by the given conversion factor.

Example - Feet to Meters

$$(10 \text{ ft}) \times (0.304800 \text{ m/ft}) \times (1/3 \text{ yd/ft}) = 54.68066 \text{ yd}$$

Conversely, you can convert units from the right hand side to those units on the left by dividing by the conversion factor

Example - Millimeters to Inches

$$(50 \text{ mm}) / (25.4 \text{ mm/in}) = 1.97 \text{ in.}$$

<b>Common Engineering Design Conversion Factors</b>		
Given	Multiply by	To Find
<b>Length [L]</b>		
Foot (ft)	0.304800	Meter (m)
Inch (in)	25.4000	Millimeter (mm)
Mile (mi)	1.609344	Kilometer (km)
<b>Area [L]<sup>2</sup></b>		
ft <sup>2</sup>	0.092903	m <sup>2</sup>
in <sup>2</sup>	645.16	mm <sup>2</sup>
in <sup>2</sup>	6.45160	cm <sup>2</sup>
<b>Volume [L]<sup>3</sup> &amp; Capacity</b>		
in <sup>3</sup>	16.3871	cm <sup>3</sup>
ft <sup>3</sup>	0.028317	m <sup>3</sup>
ft <sup>3</sup>	7.4805	Gallon
ft <sup>3</sup>	28.3168	Liter (l)
Gallon	3.785412	Liter

<b>Energy, Work or Heat [M] [L]<sup>2</sup> [t]<sup>-2</sup></b>		
Btu	1.05435	kJ
Btu	0.251996	kcal
Calories (cal)	4.184*	Joules (J)
ft-lbf	1.355818	J
ft-lbf	0.138255	kgf-m
hp-hr	2.6845	MJ
KWH	3.600	MJ
m-kgf	9.80665*	J
N-m	1.	J
<b>Flow Rate [L]<sup>3</sup> [t]<sup>-1</sup></b>		
ft <sup>3</sup> /min	7.4805	gal/min
ft <sup>3</sup> /min	0.471934	l/s
gal/min	0.063090	l/s
<b>Force or Weight [M] [L] [t]<sup>-2</sup></b>		
kgf	9.80665*	Newton (N)
lbf	4.44822	N
lbf	0.453592	Kgf
<b>Fracture Toughness</b>		
ksi sqr(in)	1.098800	MPa sqr(m)
<b>Heat Content</b>		
Btu/lbm	0.555556	cal/g
Btu/lbm	2.324444	J/g
Btu/ft <sup>3</sup>	0.037234	MJ/m <sup>3</sup>
<b>Heat Flux</b>		
Btu/hr-ft <sup>2</sup>	7.5346 E-5	cal/s-cm <sup>2</sup>
Btu/hr-ft <sup>2</sup>	3.1525	W/m <sup>2</sup>
cal/s-cm <sup>2</sup>	4.184*	W/cm <sup>2</sup>
<b>Mass Density [M] [L]<sup>-3</sup></b>		
lbm/in <sup>3</sup>	27.68	g/cm <sup>3</sup>
lbm/ft <sup>3</sup>	16.0184	kg/m <sup>3</sup>
<b>Power [M] [L]<sup>2</sup> [t]<sup>-3</sup></b>		
Btu/hr	0.292875	Watt (W)

ft-lbf/s	1.355818	W
Horsepower (hp)	745.6999	W
Horsepower	550.*	ft-lbf/s
<b>Pressure (fluid) [M] [L]<sup>-1</sup> [t]<sup>-2</sup></b>		
Atmosphere (atm)	14.696	lbf/in <sup>2</sup>
atm	1.01325 E5*	Pascal (Pa)
lbf/ft <sup>2</sup>	47.88026	Pa
lbf/in <sup>2</sup>	27.6807	in. H <sub>2</sub> O at 39.2°F
<b>Stress [M] [L]<sup>-1</sup> [t]<sup>-2</sup></b>		
kgf/cm <sup>2</sup>	9.80665 E-2*	MPa
ksi	6.89476	MPa
N/mm <sup>2</sup>	1.	MPa
kgf/mm <sup>2</sup>	1.42231	ksi
<b>Specific Heat</b>		
Btu/lbm-°F	1.	cal/g-°C
<b>Temperature*</b>		
Fahrenheit	(°F-32) /1.8	Celsius
Fahrenheit	°F+459.67	Rankine
Celsius	°C+273.16	Kelvin
Rankine	R/1.8	Kelvin
<b>Thermal Conductivity</b>		
Btu-ft/hr-ft <sup>2</sup> -°F	14.8816	cal-cm/hr-cm <sup>2</sup> -°C

\* Indicates exact conversion(s)