Conversions Between US Units (English) and SI Units (Metric)

Quantity	US Unit	SI Unit	Coversion Factor
Length	inch (in.)	millimeter (mm)	1 in. = 25.4mm
Pressure*	pounds / sq. in.	bar	1 bar = 14.5 PSI
Vacuum**	inches of mercury (in. Hg)	mm of mercury (mm Hg)	1" Hg = 25.4mm Hg
Flow***	cubic feet per minute (cfm)	cubic decimeters per sec (dm3/sec)	2.12 cfm = 1 dm3/sec
Force	pound (f) or lb. (f)	Newton (N)	1 lb (f) = 4.44 N
Mass	pound (m) or lb. (m)	kilogram (Kg)	1 Kg = 2.2 lbs
Volume****	gallon (US gallon)	liter (l)	1 US Gal = 3.71 l
Temperature	degrees Fahrenheit (°F)	degrees Celsius (°C)	°C = 5/9 (°F-32)
Torque	pounds (f) - inches (lbs (f) - in.)	Newton-meters (Nm)	1 Nm = 8.88 lb(f)-in.
Power	horsepower (HP)	kilowatt (kw)	1 kw = 1.34 HP
Frequency	cycles per second (cps)	Hertz (Hz)	1 Hz = 1 cps
Velocity	feet per second (fps)	meter per second (m/s)	1 m/s = 3.28 fps

*Above Atmospheric (PSI or Bar); **Below Atmospheric (Hg); ***Gas; (f) = force; (m) = mass

Interchange Tables

How to Use: The following charts interchange units from the SI International Standard, the US system (or English System) and older metric systems. The left column is the basic SI unit. Equivalents are in the same line. To best use these charts, find the unit that is to be converted and move to the row with the "1" in it. Move in the same row to the unit you are changing the value to and multiply by that number to make the conversion.

Torque

Newton-Meters	Kilopond-Meters	Foot-lbs	Inch-lbs
1	1.020×10^{-1}	7.376×10^{-1}	8.851
0.01	1	7.233	86.80
1.356	1.382×10^{-1}	1	12
1.130×10^{-1}	1.52×10^{-2}	8.333×10^{-2}	1

Gravity Due to Acceleration

US System (g) = 32.2 feet per sec. per sec.
Metric System (g) = 105.5 meters per sec. per sec

Length
(Linear Measurement)

Meter	Centimeter	Kilometer	Mile	Inch	Foot
1	100	1×10^{4}	6.214×10^{-4}	39.370	3.281
0.01	1	1×10^{5}	6.214×10^{-6}	3.937×10^{-1}	3.281×10^{-2}
1×10^{-3}	0.10	1×10^{-6}	6.214×10^{-7}	3.937×10^{-2}	3.281×10^{-3}
1×10^{3}	1×10^{5}	1	6.214×10^{-7}	3.937×10^{4}	3.281×10^{3}
1.609×10^{3}	1.609×10^{5}	1.609	1	6.336×10^{4}	5280
2.540×10^{-2}	2.540	2.540×10^{-5}	1.578×10^{-5}	1	8.333×10^{-2}
3.048×10^{-1}	30.479	3.048×10^{-4}	1.894×10^{-4}	12	1

1 mm = 0.001 m = 0.10 cm = 0.000001 km = 0.03937 in = 0.003281 ft

AREA
(Square Measurement)

Square Meter	Sq. Centimeter	Sq. Kilometer	Square Inch	Square Foot	Square Mile
1	1×10^{4}	1×10^{6}	1.550×10^{3}	10.764	3.861×10^{-7}
1×10^{-3}	1	1×10^{-10}	1.550×10^{-1}	1.076×10^{-3}	3.861×10^{-11}
1×10^{-6}	1×10^{-2}	1×10^{-12}	1.550×10^{3}	1.076×10^{-5}	3.861×10^{-13}
1×10^{6}	1×10^{10}	1	1.550×10^{9}	1.076×10^{7}	3.861×10^{-1}
6.452×10^{-4}	6.452	6.452×10^{-10}	1	6.944×10^{-3}	2.491×10^{-10}
9.290×10^{-2}	9.290×10^{2}	9.290×10^{-8}	144	1	3.587×10^{-8}
2.590×10^{6}	2.590×10^{10}	2.590	2.788×10^{7}	2.788×10^{7}	1

1 sq. mm = 0.000001 sq. m = 0.00155 sq. in. = 0.00001076 sq. ft

Volume (Cubic)

Cubic Meter	Cu. Decimeter	Cu. Centimeter	US Gallon	Cu. Inch	Cubic Foot
1	1×10^{3}	1×10^{6}	2.642×10^{2}	6.102×10^{4}	35.314
1×10^{-3}	1	1×10^{3}	2.642×10^{-1}	61.024	3.531×10^{-2}
1×10^{-6}	1×10^{-3}	1	2.642×10^{-4}	6.102×10^{2}	3.531×10^{-5}
4.546×10^{-3}	4.546	4.546×10^{3}	1.200	2.774×10^{2}	1.605×10^{-1}
3.785×10^{-3}	3.785	3.785×10^{3}	1	2.310×10^{2}	1.337×10^{-1}
1.639×10^{-5}	1.639×10^{-2}	16.387	4.329×10^{-3}	1	5.787×10^{-4}
2.832×10^{-2}	28.317	2.832×10^{4}	7.481	1.728×10^{3}	1

1 imperial gallon = 1.2 US gallon = 0.004546 cu. meter = 4.546 liter = 4546 cu. centimeters

Force (Including Force due to Weight)

Newton	Dyne	Kilopond	Metric Ton	US Ton	Pound
1	1×10^{5}	1.020×10^{-1}	1.020×10^{-4}	1.124×10^{-4}	2.248×10^{-1}
1×10^{5}	1	1.020×10^{-6}	1.020×10^{-9}	1.124×10^{-9}	2.248×10^{-6}
9.807	9.807×10^{5}	1	1×10^{-3}	1.102×10^{-3}	2.205
9.807×10^{3}	9.807×10^{8}	1000	1	1.102	2.205×10^{3}
9.964×10^{3}	9.964×10^{8}	1.016×10^{2}	1.016	1.120	2.240×10^{3}
8.896×10^{3}	8.896×10^{8}	9.072×10^{2}	9.072×10^{-1}	1	2000
4.448	4.448×10^{5}	4.536×10^{-1}	4.536×10^{-4}	5×10^{-4}	1

1 long ton = 9964 Newtons = 1016 Kiloponds = 1.016 metric tons = 1.120 US tons = 2240 pounds

Mass (Not Weight)

Kilogram	Gram	Metric Ton	Newton	Pound	US Ton
1	1000	1×10^{-3}	9.807	2.205	1.102×10^{-3}
1×10^{-3}	1	1×10^{-6}	9.807×10^{-3}	2.205×10^{-3}	1.102×10^{6}
1×10^{3}	1×10^{6}	1	9.807×10^{3}	2.205×10^{3}	1.102
1.020×10^{-1}	1.020×10^{2}	1.020×10^{-4}	1	2.248×10^{-1}	1.120×10^{-4}
4.536×10^{-1}	4.536×10^{2}	4.536×10^{-4}	4.448	1	5×10^{-4}
14.594	1.459×10^{4}	1.459×10^{-2}	1.431×10^{-2}	32.170	1.609×10^{-2}
9.072×10^{2}	9.072×10^{5}	9.072×10^{-1}	8.896×10^{3}	2000	1

Unit Pressure (Either Fluid or Mechanical)

Bar	Newton/m^2 (Pascal)	Kilopond/m^2	Atmosphere	Pounds/Ft^2	Pounds/Inch^2 (PSI)
1×10^{-5}	1	1.020×10^{-1}	9.869×10^{-6}	2.088×10^{-2}	1.45×10^{-4}
1	1×10^{6}	1.020×10^{4}	9.869×10^{-1}	2.088×10^{3}	14.5
9.807×10^{-5}	9.807	1	9.678×10^{-5}	2.048×10^{-1}	1.422×10^{-3}
9.807×10^{-1}	9.807×10^{4}	1×10^{4}	9.678×10^{-1}	2.048×10^{3}	14.220
1.013	1.013×10^{5}	1.033×10^{4}	1	2.116×10^{3}	14.693
4.789×10^{-4}	47.893	4.884	4.726×10^{-4}	1	6.944×10^{-3}
6.897×10^{-2}	6.897×10^{3}	7.033×10^{2}	6.806×10^{-2}	1.440×10^{2}	1

1 kiloponds / sq cm = 0.9807 bar = 98070 Pascal = 0.9678 atmos = 2048 lbs / sq ft = 14.22 lbs / sq in

Velocity

Meters / Second	Kilometers / Hour	Miles / Hour	Feet / Minute	Feet / Second	Inches / Minute
1	3.6	2.237	1.968×10^{2}	3.281	2.362×10^{3}
1×10^{-1}	1×10^{-4}	6.214×10^{-5}	5.468×10^{-3}	9.113×10^{-5}	6.562×10^{-2}
2.778×10^{-1}	1	6.214×10^{-1}	5.468×10^{-1}	9.113×10^{-1}	6.562×10^{2}
4.470×10^{-1}	1.609	1	88	1.467	1.056×10^{3}
5.080×10^{-3}	1.829×10^{-2}	1.136×10^{-2}	1	1.667×10^{-2}	12
3.048×10^{-1}	1.097	6.818×10^{-1}	60	1	7.2×10^{2}
4.233×10^{-4}	1.524×10^{-3}	9.470×10^{-4}	8.333×10^{-2}	1.389×10^{-3}	1

1 decimeter / second = 0.1 meters / second = 0.005468 feet / minute = 0.06562 inches / minute