

# Chart of Conversion Factors

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From English to Metric System  
and Metric to English System

ENGLISH

NGLISH

GLISH

LISH

ISH

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METRIC

# Chart of Conversion Factors

## Preface

The conversion factors in the following tables are for conversion of our customary (English) units of measurement to SI\* units, and for convenience, reciprocals are shown for converting SI units back to the English system. The first table contains rule-of-thumb figures, useful for "getting the feel" of SI units or mental estimation. The succeeding tables contain factors accurate to 3 or more significant figures. Please refer to known reference volumes for additional accuracy, as well as for factors dealing with other scientific notation involving SI units.

\* International System of Units

## Approximate Conversions

(1)  
Multiply A x B To Get D

(2)  
Multiply D x C To Get A

A	B	C	D
inch (in)	2.5	0.4	centimeter (cm)
foot (ft)	0.305	3.3	meter (m)
yard (yd)	0.91	1.1	meter (m)
mile (mi)	1.61	0.62	kilometer (km)
nautical mile	1.85	0.54	kilometer (km)
square inch (in <sup>2</sup> )	6.45	0.155	square centimeter (cm <sup>2</sup> )
square foot (ft <sup>2</sup> )	0.093	10.8	square meter (m <sup>2</sup> )
acre (43560 ft <sup>2</sup> )	0.405	2.5	hectare (ha) (10,000 m <sup>2</sup> )
gallon (US)	3.8	0.26	liter (L)
barrel (42 gal)	0.159	6.3	cubic meter (m <sup>3</sup> )
ounce (oz)	28.0	0.035	gram (g)
pound (lb av)	0.454	2.2	kilogram (kg)
short ton (2,000 lb)	0.907	1.1	metric ton (t)
pound (mass)/foot (lb/ft)	1.5	0.67	kilogram/meter

Example (1):  
Convert 6 inches to centimeters  
6(A) x 2.5(B) = 15 cm (D)

Example (2):  
Convert 10 centimeters to inches  
10(D) x 0.4(C) = 4 in (A)

This same format is used throughout this metrication guide.

The above conversion factors are derived from the following factors:

- 1 inch (in) = 2.54 (exact) centimeters (cm)
- 1 liter (L) = 1,000 cubic centimeters (cm<sup>3</sup>)
- 1 pound (lb) = 0.45359 kilograms (kg)

## Other Conversion Factors

of Units Commonly Used by  
the Conservation Division

(Three or More Significant  
Figures)

A	B	C	D
<b>Length</b>			
inch (in)	2.540	0.3937	centimeter (cm)
foot (ft)	0.3048	3.281	meter (m)
yard (yd)	0.9144	1.0936	meter (m)
rod (16½ ft)	5.0292	0.1988	meter (m)
chain (66 ft)	20.1168	0.0497	meter (m)
mile	1.609	0.621	kilometer (km)
mile (nautical)	1.852	0.540	kilometer (km)

A	B	C	D
<b>Area</b>			
square inch (in <sup>2</sup> )	6.4516	0.1550	square centimeter (cm <sup>2</sup> )
square foot (ft <sup>2</sup> )	0.0929	10.7643	square meter (m <sup>2</sup> )
square yard (yd <sup>2</sup> )	0.8361	1.196	square meter (m <sup>2</sup> )
acre (43560 ft <sup>2</sup> )	0.40469	2.471	hectare (ha)
square mile (mi <sup>2</sup> )	2.590	0.386	square kilometer (km <sup>2</sup> )
section (640 acre) or square mile (mi <sup>2</sup> )	258.9988	0.003861	hectare (ha)
<b>Volume, Capacity</b>			
cubic inch (in <sup>3</sup> )	1.639	0.610	cubic centimeter (cm <sup>3</sup> )
cubic foot (ft <sup>3</sup> )	0.0283	35.335	cubic meter (m <sup>3</sup> )
cubic yard (yd <sup>3</sup> )	7.646	0.1308	cubic meter (m <sup>3</sup> )
cubic mile (mi <sup>3</sup> )	4.1682	0.2399	cubic kilometer (km <sup>3</sup> )
gallon (231 in <sup>3</sup> )	3.785	0.264	liter (L)
barrel (42 US gal)	0.15899	6.2897	cubic meters (m <sup>3</sup> )
acre-foot	1,233.482	0.0008107	cubic meters (m <sup>3</sup> )
<b>Mass (Weight)</b>			
ounce (av)	28.34952	0.03527	gram (g)
pound	0.4535924	2.2046	kilogram (kg)
ton (US short)	0.9071847	1.1023	ton (t)*
* 1 metric ton = 1,000 kilograms (kg)			
<b>Mass/Length</b>			
pound/ft (lb/ft)	1.48816	0.67197	kilogram/meter (kg/m)
<b>Mass/Volume (Density, Concentration)</b>			
pound/cubic ft (lb/ft <sup>3</sup> )	16.01846	0.062428	kilogram/cubic meter (kg/m <sup>3</sup> )
pound/gallon (US)	119.8264	0.008345	kilogram/cubic meter (kg/m <sup>3</sup> )
pound/gallon (US)	0.1198264	8.345406	gram/cubic centimeter (g/cm <sup>3</sup> )
<b>Volume/Time (Flow Rate)</b>			
cubic ft/second (ft <sup>3</sup> /s)	28.317	0.0353	cubic decimeter/sec (dm <sup>3</sup> /s)*
cubic ft/min (ft <sup>3</sup> /min)	0.4719	2.119	cubic decimeter/sec (dm <sup>3</sup> /s)
US gallon/minute	0.06309	15.850	cubic decimeter/sec (dm <sup>3</sup> /s)
barrel/day	0.00184	543.478	cubic decimeter/sec (dm <sup>3</sup> /s)
* 1 cubic decimeter (dm <sup>3</sup> ) = 1 liter (L), exactly.			
<b>Heat, Calorific Value</b>			
British thermal unit (60°F) (Btu)	1055	0.000948	joule (J)
Calorie (20°C)	4.182	0.239	joule (J)

A	B	C	D
<b>Heat, Calorific Value—Continued</b>			
Brit. ther. unit/lb (Btu/lb)	2.326	0.430	kilojoule/kilogram (kJ/kg)
Brit. ther. unit/gal (Btu/gal)	278.72	0.00359	kilojoule/cubic meter (kJ/m <sup>3</sup> )
Brit. ther. unit/cubic foot (Btu/ft <sup>3</sup> )	37.259	0.0268	kilojoule/cubic meter (kJ/m <sup>3</sup> )
<b>Gas Oil Ratio</b>			
cubic foot/barrel (ft <sup>3</sup> /bbl)	0.178	5.618	cubic meter/cubic meter (m <sup>3</sup> /m <sup>3</sup> )
<b>Pressure</b>			
pound/square inch (psi)	0.07031	14.22	kilogram/square centimeter (kg/cm <sup>2</sup> )
pound/square inch (psi)	6.895	0.1450	kilopascal (kPa)*
* 1 kilopascal (kPa) = 1 newton per square meter (N/m <sup>2</sup> )			

#### Temperature

To convert temperature in °Fahrenheit to °Celsius, subtract 32 and divide by 1.8.

To convert temperature in °Celsius to °Fahrenheit, multiply by 1.8 and add 32.

#### Footnote

In SI practice, number notation is made by separating digits into groups of three on either side of a decimal point, with a space or half space between groups. American Petroleum Institute publications show conversion factors in this manner, written as a number between one and ten with six or less decimal places. The number is followed by E (for exponent), a plus or minus symbol, and two digits which indicate the power of 10 by which the number must be multiplied to obtain the correct value. For example, 4.046 856 E+ 03 is 4.046 856 x 10<sup>3</sup> or 4 046.856. In writing, SI prefixes should be used to denote order of magnitude, as a substitute for writing powers of 10. Following is a chart of SI prefixes:

Multiplication Factors	Prefix	SI Symbol
1 000 000 000 000 = 10 <sup>12</sup>	tera	T
1 000 000 000 = 10 <sup>9</sup>	giga	G
1 000 000 = 10 <sup>6</sup>	mega	M
1 000 = 10 <sup>3</sup>	kilo	k
100 = 10 <sup>2</sup>	hecto*	h
10 = 10 <sup>1</sup>	deka*	da
0.1 = 10 <sup>-1</sup>	deci*	d
0.01 = 10 <sup>-2</sup>	centi*	c
0.001 = 10 <sup>-3</sup>	milli	m
0.000 001 = 10 <sup>-6</sup>	micro	μ
0.000 000 001 = 10 <sup>-9</sup>	nano	n
0.000 000 000 001 = 10 <sup>-12</sup>	pico	p
0.000 000 000 000 001 = 10 <sup>-15</sup>	femto	f
0.000 000 000 000 000 001 = 10 <sup>-18</sup>	atto	a

\* To be avoided where possible.

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## Notes