

## CONVERSION FACTORS & FORMULAE

### SI units

Where SI units differ from technical metric units, the conversions are given for both.

The following list details the main SI units and their symbols, which are used throughout these tables.

Length	Meter	m
Area	Square meter	m <sup>2</sup>
Volume	cubic meter	m <sup>3</sup>
Mass	kilogram	kg
Density	kilograms per cubic meter	kg/m <sup>3</sup>
Force	Newton	N
Pressure stress	Pascal	Pa(N/m <sup>2</sup> )
Viscosity, dynamic	Pascal second	Pa s
Viscosity, kinematics	Square meter per second	m <sup>2</sup> /s
Energy	Joule	J
Power	Watt	W (J/s)

### Length

1 km	0.621371 mile	1 mile	1.60934 km
1 m	1.09361 yd	1 yd	0.9144 m
	3.2808 ft	1 ft	0.3048 m
1 cm	0.393701 in	1 in	25.4 mm
1 mm	0.03937 in	1 milli-in(thou)	25.4 μm
1 μm	39.3701 μm	1μ in	0.0254μm

<b>Area</b>			
1 km <sup>2</sup>	247.105 acres	1 mile <sup>2</sup>	2.58999km <sup>2</sup>
(100 hectares)	2.47405 acres	1 acre	4046.86 m <sup>2</sup>
1 hectare (ha)	10 000 m <sup>2</sup>	(4840yd <sup>2</sup> )	0.404686 ha
1 m <sup>2</sup>	1.19599 yd <sup>2</sup>	1 yd <sup>2</sup>	0.836127 m <sup>2</sup>
1 cm <sup>2</sup>	0.155 in <sup>2</sup>	1 ft <sup>2</sup>	0.092903 m <sup>2</sup>
1 mm <sup>2</sup>	0.00155 in <sup>2</sup>	1 in <sup>2</sup>	646.16mm <sup>2</sup>

<b>Volume, capacity</b>			
1m <sup>3</sup>	1.30795 yd <sup>3</sup>	1 ml (cm <sup>3</sup> )	0.0352 fl oz
1 dm <sup>3</sup> (litre)	0.03531 ft <sup>3</sup> 0.21997 imp gal 1.7605 pint 0.2642 US gal	1 yard 1 ft <sup>3</sup> 1 in <sup>3</sup> 1 imp gal	0.76455 m <sup>3</sup> 28.3168 dm <sup>3</sup> 16.3871 cm <sup>3</sup> 4.54609 dm <sup>3</sup>
1 cm <sup>3</sup> (ml)	0.06102 in <sup>3</sup> 0.0352 fl oz	1 pint 1 fl oz	0.56826 dm <sup>3</sup> 28.4131 cm <sup>3</sup>
1 litre (dm <sup>3</sup> )	0.21997 imp gal 1.7605 pint		

<b>Mass</b>	
1 tonne	10000kg 0.98420 ton 2204.62 lb
1 kg	0.01968 cwt 2.20462 lb
1 gm	0.03527 oz
1 ton	1016.05 kg 1.01605 tonne
1 cwt	50.802.3 kg
1 lb	0.45359 kg
1 oz	28.349 g

<b>Density</b>	
1 kg/m <sup>3</sup>	1.686 lb/yd <sup>3</sup> 0.06243 lb/ft <sup>3</sup>
1 g/cm <sup>3</sup>	62.4280 lb/ft <sup>3</sup>
1 ton/yd <sup>3</sup>	1328.94 kg/cm <sup>3</sup>
1 lb/yd <sup>3</sup>	0.593 kg/m <sup>3</sup>
1 lb/ft <sup>3</sup>	16.0185 kg/m <sup>3</sup>
1 lb/in <sup>3</sup>	27.6799g/m <sup>3</sup>

<b>Force</b>	
1 N	0.10197 kgf 0.22481
1kN	101.971 kgf 224.809 lbf
1 kgf (Kilopond)	9.80665 N 2.20462 lbf
1 dyne	105N 0.224809 x 105lbf
1 lbf	4.44822 N 0.45359 kgf
1 tonf	9.6402kN 1016.05 kgf

<b>Viscosity, dynamic</b>	
1 Pa s (Ns/m <sup>2</sup> )	0.0208854 lbsf/ft <sup>2</sup>
1 cP (Centipoise)	0.0208854 lbs/ft <sup>2</sup> 2.028854 x 10 <sub>5</sub> lbsf/ft <sup>2</sup>
1lbf <sub>s</sub> /ft <sup>2</sup> 1lbf <sub>s</sub> /fts	0.001 Pa s 17.8803 Pa s 1488.16 cP 1.48816 kg/ms
<b>Viscosity, kinematics</b>	
1 m <sup>2</sup> s	10.7639 ft <sup>2</sup> /s
1 cSt (Centistokes)	5.58001 in <sup>2</sup> /s 1mm <sup>2</sup> /s 10 <sup>6</sup> m <sup>2</sup> /s
1 ft <sup>2</sup> /h	0.092903 m <sup>2</sup> /h 25.8064 cSt
1 in <sup>2</sup> /s	645.16 mm <sup>2</sup> /s 645.16 cSt

**Pressure stress**

1 Pa (N/m <sup>2</sup> )	1 mbar 0.000145 lbf/in <sup>2</sup>
1 kPa (N/m <sup>2</sup> )	0.01 kgf/cm <sup>2</sup> 10 mbar 20.885 lbf/ft <sup>2</sup> 0.2953 in Hg
1 kg/cm <sup>2</sup> )	98.0665 kPa 14.233 lbf/in <sup>2</sup>
1 bar	100 kPa 14.5038 lbf/in <sup>2</sup>
1 mbar	100 Pa 2.0885 lbf/in <sup>2</sup>
1 atm	101.325 kPa 14.6959 lbf/in <sup>2</sup>
1mm Hg (torr)	133.322 Pa 0.01934 lbf/in <sup>2</sup>
1 mm H <sub>2</sub> O	9.80665 Pa 0.001422 lbf/in <sup>2</sup>
1 lbf/in <sup>2</sup>	6.89476 kPa 0.07031 kgf/cm <sup>2</sup> 68.9476 mbar
1 lbf/ft <sup>2</sup>	47.8803 Pa 0.4788 mbar
1 ton/ft <sup>2</sup>	107.252 kPa 1.094 kgf/cm <sup>2</sup>
1 in Hg	3.38639 kPa 0.491 lbf/in <sup>2</sup>
1 ft H <sub>2</sub> O	2.98907 kPa 0.030 kgf/cm <sup>2</sup> 22.3997 mm Hg

<b>Energy</b>	
1 MJ	0.277778 kWh
1 J	0.737562 ft lbf
1 kgf m	9.80665 J 7.23301 ft lbf
1 therm	105.506
1kWh	3.6 MJ
1 Btu (british thermal unit)	1.05506 kJ

<b>Power</b>	
1 hp (horse power)	745.700 W (J/s)
1 ft/lbf/s	1.35582 W

<b>Temperature</b>	
F	$1.8 (C) + 32$
C	$(F - 32)/1.8$
K	$(C) + 273.15$