

# Conversion factors

# III

The following values for the fundamental constants were used in the preparation of the factors:

- 1 m = 39.37 inch = 3.281 ft
- 1 lb (weight) = 0.4536 kg = 0.03108 slug
- 1 slug = 14.594 kg
- 1 lb (force) = 4.448 newton
- Acceleration due to gravity =  $9.807 \text{ m/s}^2 = 32.174 \text{ ft/s}^2$
- Density of  $\text{H}_2\text{O}$  at  $4^\circ\text{C} = 10^3 \text{ kg/m}^3$
- Density of Hg at  $0^\circ\text{C} = 1.3595 \times 10^4 \text{ kg/m}^3$
- 1 U.S. lb = 1 British lb
- 1 U.S. gallon = 0.83267 British gallon

**TABLE C.1** Conversion factors

To convert	Into	Multiply by	Conversely by
Acres	ft <sup>2</sup>	$4.356 \times 10^4$	$2.296 \times 10^{-5}$
	miles <sup>2</sup>	$1.562 \times 10^{-3}$	640
	m <sup>2</sup>	4 047	$2.471 \times 10^4$
	hectare ( $10^4 \text{ m}^2$ )	0.4047	2.471
Atm	in. $\text{H}_2\text{O}$ at $4^\circ\text{C}$	406.80	$2.458 \times 10^{-3}$
	in. Hg at $0^\circ\text{C}$	29.92	$3.342 \times 10^{-2}$
	ft. $\text{H}_2\text{O}$ at $4^\circ\text{C}$	33.90	$2.950 \times 10^{-2}$
	mm Hg at $0^\circ\text{C}$	760	$1.316 \times 10^{-3}$
	lb/in. <sup>2</sup>	14.70	$6.805 \times 10^{-2}$
	newtons/m <sup>2</sup>	$1.0132 \times 10^5$	$9.872 \times 10^{-6}$
$^\circ\text{C}$	kg/m <sup>2</sup>	$1.033 \times 10^4$	$9.681 \times 10^{-5}$
	$^\circ\text{F}$	$(^\circ\text{C} \times 9/5) + 32$	$(^\circ\text{F} - 32) \times 5/9$
cm	in.	0.3937	2.540
	ft	$3.281 \times 10^{-2}$	30.48
	m	$10^{-2}$	$10^2$
circular mils	in. <sup>2</sup>	$7.85 \times 10^{-7}$	$1.274 \times 10^6$
	cm <sup>2</sup>	$5.067 \times 10^{-6}$	$1.974 \times 10^5$

(Continued)

**TABLE C.1** Conversion factors (*continued*)

To convert	Into	Multiply by	Conversely by
cm <sup>2</sup>	in. <sup>2</sup>	0.1550	6.452
	ft <sup>2</sup>	$1.0764 \times 10^{-3}$	929
	m <sup>2</sup>	$10^{-4}$	$10^4$
cm <sup>3</sup>	in. <sup>3</sup>	0.06102	16.387
	ft <sup>3</sup>	$3.531 \times 10^{-5}$	$2.832 \times 10^4$
	m <sup>3</sup>	$10^{-6}$	$10^6$
deg (angle)	radians	$1.745 \times 10^{-2}$	57.30
dynes	lb (force)	$2.248 \times 10^{-6}$	$4.448 \times 10^5$
	newtons	$10^{-5}$	$10^5$
dynes/cm <sup>2</sup>	lb/ft <sup>2</sup> (force)	$2.090 \times 10^{-3}$	478.5
	newtons/m <sup>2</sup>	$10^{-1}$	10
ergs	ft-lb (force)	$7.376 \times 10^{-8}$	$1.356 \times 10^7$
	joules	$10^{-7}$	$10^7$
ergs/cm <sup>3</sup>	ft-lb/ft <sup>3</sup>	$2.089 \times 10^{-3}$	478.7
ergs/sec	watts	$10^{-7}$	$10^7$
	ft-lb/sec	$7.376 \times 10^{-8}$	$1.356 \times 10^7$
ergs/sec-cm <sup>2</sup>	ft-lb/sec-ft <sup>2</sup>	$6.847 \times 10^{-6}$	$1.4605 \times 10^4$
fathoms	ft	6	0.16667
ft	in.	12	0.08333
	cm	30.48	$3.281 \times 10^2$
	m	0.3048	3.281
ft <sup>2</sup>	in. <sup>2</sup>	144	$6.945 \times 10^3$
	cm <sup>2</sup>	$9.290 \times 10^2$	0.010764
	m <sup>2</sup>	$9.290 \times 10^{-2}$	10.764
ft <sup>3</sup>	in. <sup>3</sup>	1728	$5.787 \times 10^{-4}$
	cm <sup>3</sup>	$2.832 \times 10^4$	$3.531 \times 10^{-5}$
	m <sup>3</sup>	$2.832 \times 10^{-2}$	35.31
	liters	28.32	$3.531 \times 10^{-2}$
Ft H <sub>2</sub> O at 4°C	in. Hg at 0°C	0.8826	1.133
	lb/in. <sup>2</sup>	0.4335	2.307
	lb/ft <sup>2</sup>	62.43	$1.602 \times 10^{-2}$
	newton/m <sup>2</sup>	2989	$3.345 \times 10^{-4}$
Gal (liquid U.S.)	gal (liquid Brit. Imp.)	0.8327	1.2010
	liters	3.785	0.2642
	m <sup>3</sup>	$3.785 \times 10^{-3}$	264.2
gm	oz (weight)	$3.527 \times 10^{-2}$	28.35
	lb (weight)	$2.205 \times 10^{-3}$	453.6

**TABLE C.1** Conversion factors (*continued*)

To convert	Into	Multiply by	Conversely by
hp (550 ft-lb/sec)	ft-lb/min	$3.3 \times 10^4$	$3.030 \times 10^{-5}$
	watts	745.7	$1.341 \times 10^{-3}$
	kw	0.7457	1.341
in.	ft	0.0833	12
	cm	2.540	0.3937
	m	0.0254	39.37
in. <sup>2</sup>	ft <sup>2</sup>	0.006945	144
	cm <sup>2</sup>	6.452	0.1550
	m <sup>2</sup>	$6.452 \times 10^{-4}$	1550
in. <sup>3</sup>	ft <sup>3</sup>	$5.787 \times 10^{-4}$	$1.728 \times 10^3$
	cm <sup>3</sup>	16.387	$6.102 \times 10^{-2}$
	m <sup>3</sup>	$1.639 \times 10^{-5}$	$6.102 \times 10^4$
kg	lb (weight)	2.2046	0.4536
	slug	0.06852	14.594
	gm	$10^3$	$10^{-3}$
kg.m <sup>3</sup>	lb/in. <sup>2</sup> (weight)	0.001422	703.0
	lb/ft <sup>2</sup> (weight)	0.2048	4.882
	gm/cm <sup>2</sup>	$10^{-1}$	10
kg/m <sup>3</sup>	lb/in. <sup>3</sup> (weight)	$3.613 \times 10^{-5}$	$2.768 \times 10^4$
	lb/ft <sup>3</sup> (weight)	$6.243 \times 10^{-2}$	16.02
	gm/cm <sup>3</sup>	1000	0.001
liters	in. <sup>3</sup>	61.03	$1.639 \times 10^{-2}$
	ft <sup>3</sup>	0.03532	28.32
	pints (liquid U.S.)	2.1134	0.47318
	quarts (liquid U.S.)	1.0567	0.94636
	gal (liquid U.S.)	0.2643	3.785
log <sub>e</sub> n	log <sub>10</sub> n	0.4343	2.303
	in.	39.371	0.02540
	ft	3.2808	0.30481
m	yd	1.0936	0.9144
	cm	$10^2$	$10^{-2}$
	in. <sup>2</sup>	1550	$6.452 \times 10^{-4}$
m <sup>2</sup>	ft <sup>2</sup>	10.764	$9.290 \times 10^{-2}$
	yd <sup>2</sup>	1.196	0.8362
	cm <sup>2</sup>	$10^4$	$10^{-4}$

(Continued)

**TABLE C.1** Conversion factors (*continued*)

To convert	Into	Multiply by	Conversely by
m <sup>3</sup>	in. <sup>3</sup>	$6.102 \times 10^4$	$1.639 \times 10^{-5}$
	ft <sup>3</sup>	35.31	$2.832 \times 10^{-2}$
m <sup>3</sup> ( <i>Cont.</i> )	yd <sup>3</sup>	1.3080	0.7646
	cm <sup>3</sup>	$10^6$	$10^{-6}$
microbars (dynes/cm <sup>2</sup> )	lb/in. <sup>2</sup>	$1.4513 \times 10^{-5}$	$6.890 \times 10^4$
	lb/ft <sup>2</sup>	$2.090 \times 10^{-3}$	478.5
	newtons/m <sup>2</sup>	$10^{-1}$	10
miles (nautical)	ft	6080	$1.645 \times 10^{-4}$
	km	1.852	0.5400
miles (statute)	ft	5280	$1.894 \times 10^{-4}$
	km	1.6093	0.6214
miles <sup>2</sup> (statute)	ft <sup>2</sup>	$2.788 \times 10^7$	$3.587 \times 10^{-8}$
	km <sup>2</sup>	2.590	0.3861
	acres	640	$1.5625 \times 10^{-3}$
mph	ft/min	88	$1.136 \times 10^{-2}$
	km/min	$2.682 \times 10^{-2}$	37.28
	km/hr	1.6093	0.6214
neper	dB	8.686	0.1151
newtons	lb (force)	0.2248	4.448
	dynes	$10^5$	$10^{-5}$
newtons/m <sup>2</sup>	lb/in. <sup>2</sup> (force)	$1.4513 \times 10^{-2}$	$6.890 \times 10^3$
	lb/ft <sup>2</sup> (force)	$2.090 \times 10^{-2}$	47.85
	dynes/cm <sup>2</sup>	10	$10^{-1}$
lb (force)	newtons	4.448	0.2248
lb (weight)	slugs	0.03108	32.17
	kg	0.4536	2.2046
lb H <sub>2</sub> O (distilled)	ft <sup>3</sup>	$1.602 \times 10^{-2}$	62.43
	gal (liquid U.S.)	0.1198	8.346
lb/in. <sup>2</sup> (weight)	lb/ft <sup>2</sup> (weight)	144	$6.945 \times 10^{-3}$
	kg/m <sup>2</sup>	703	$1.422 \times 10^{-3}$
lb/in. <sup>2</sup> (force)	lb/ft <sup>2</sup> (force)	144	$6.945 \times 10^{-3}$
	N/m <sup>2</sup>	6894	$1.4506 \times 10^{-4}$
lb/ft <sup>2</sup> (weight)	lb/in. <sup>2</sup> (weight)	$6.945 \times 10^{-3}$	144
	gm/cm <sup>2</sup>	0.4882	2.0482
	kg/m <sup>2</sup>	4.882	0.2048
lb/ft <sup>2</sup> (force)	lb/in. <sup>2</sup> (force)	$6.945 \times 10^{-3}$	144
	N/m <sup>2</sup>	47.85	$2.090 \times 10^{-2}$

**TABLE C.1** Conversion factors (*continued*)

To convert	Into	Multiply by	Conversely by
lb/ft <sup>3</sup> (weight)	lb/in. <sup>3</sup> (weight)	$5.787 \times 10^{-4}$	1728
	kg/m <sup>3</sup>	16.02	$6.243 \times 10^{-2}$
poundals	lb (force)	$3.108 \times 10^{-2}$	32.17
	dynes	$1.383 \times 10^4$	$7.233 \times 10^{-5}$
	newtons	0.1382	7.232
slugs	lb (weight)	32.17	$3.108 \times 10^{-2}$
	kg	14.594	0.06852
slugs/ft <sup>2</sup>	kg/m <sup>2</sup>	157.2	$6.361 \times 10^{-3}$
tons, short (2,000 lb)	tonnes (1 000 kg)	0.9075	1.102
watts	ergs/sec	$10^7$	$10^{-7}$
	hp (550 ft-lb/sec)	$1.341 \times 10^{-3}$	745.7