

UNITS CONVERSION TABLES

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These conversion tables are provided for your reference.

Units Conversion Tables

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Table 1: Multiples and Submultiples of SI units

Prefix	Symbol	Multiplying Factor	
exa	E	10^{18}	1 000 000 000 000 000 000
peta	P	10^{15}	1 000 000 000 000 000
tera	T	10^{12}	1 000 000 000 000
giga	G	10^9	1 000 000 000
mega	M	10^6	1 000 000
kilo	k	10^3	1 000
hecto*	h	10^2	100
deca*	da	10	10
deci*	d	10^{-1}	0.1
centi	c	10^{-2}	0.01
milli	m	10^{-3}	0.001
micro	u	10^{-6}	0.000 001
nano	n	10^{-9}	0.000 000 001
pico	p	10^{-12}	0.000 000 000 001
femto	f	10^{-15}	0.000 000 000 000 001
atto	a	10^{-18}	0.000 000 000 000 000 001

* these prefixes are not normally used

Table 2: Length Units

Millimeters	Centimeters	Meters	Kilometers	Inches	Feet	Yards	Miles
mm	cm	m	km	in	ft	yd	mi
1	0.1	0.001	0.000001	0.03937	0.003281	0.001094	6.21e-07
10	1	0.01	0.00001	0.393701	0.032808	0.010936	0.000006
1000	100	1	0.001	39.37008	3.28084	1.093613	0.000621
1000000	100000	1000	1	39370.08	3280.84	1093.613	0.621371
25.4	2.54	0.0254	0.000025	1	0.083333	0.027778	0.000016
304.8	30.48	0.3048	0.000305	12	1	0.333333	0.000189
914.4	91.44	0.9144	0.000914	36	3	1	0.000568
1609344	160934.4	1609.344	1.609344	63360	5280	1760	1

Table 3: Area Units

Millimeter square	Centimeter square	Meter square	Inch square	Foot square	Yard square
mm^2	cm^2	m^2	in^2	ft^2	yd^2
1	0.01	0.000001	0.00155	0.000011	0.000001
100	1	0.0001	0.155	0.001076	0.00012
1000000	10000	1	1550.003	10.76391	1.19599
645.16	6.4516	0.000645	1	0.006944	0.000772
92903	929.0304	0.092903	144	1	0.111111
836127	8361.274	0.836127	1296	9	1

Table 4: Volume Units

Centimeter cube	Meter cube	Liter	Inch cube	Foot cube	US gallons	Imperial gallons	US barrel (oil)
cm ³	m ³	ltr	in ³	ft ³	US gal	Imp. gal	US brl
1	0.000001	0.001	0.061024	0.000035	0.000264	0.00022	0.000006
1000000	1	1000	61024	35	264	220	6.29
1000	0.001	1	61	0.035	0.264201	0.22	0.00629
16.4	0.000016	0.016387	1	0.000579	0.004329	0.003605	0.000103
28317	0.028317	28.31685	1728	1	7.481333	6.229712	0.178127
3785	0.003785	3.79	231	0.13	1	0.832701	0.02381
4545	0.004545	4.55	277	0.16	1.20	1	0.028593
158970	0.15897	159	9701	6	42	35	1

Table 5: Mass Units

Grams	Kilograms	Metric tonnes	Short ton	Long ton	Pounds	Ounces
g	kg	tonne	shton	Lton	lb	oz
1	0.001	0.000001	0.000001	9.84e-07	0.002205	0.035273
1000	1	0.001	0.001102	0.000984	2.204586	35.27337
1000000	1000	1	1.102293	0.984252	2204.586	35273.37
907200	907.2	0.9072	1	0.892913	2000	32000
1016000	1016	1.016	1.119929	1	2239.859	35837.74
453.6	0.4536	0.000454	0.0005	0.000446	1	16
28	0.02835	0.000028	0.000031	0.000028	0.0625	1

Table 6: Density Units

Gram/milliliter	Kilogram/meter cube	Pound/foot cube	Pound/inch cube
g/ml	kg/m ³	lb/ft ³	lb/in ³
1	1000	62.42197	0.036127
0.001	1	0.062422	0.000036
0.01602	16.02	1	0.000579
27.68	27680	1727.84	1

Table 7: Volumetric Liquid Flow Units

Liter/second	Liter/minute	Meter cube/hour	Foot cube/minute	Foot cube/hour	US gallons/minute	US barrels (oil)/day
L/sec	L/min	M ³ /hr	ft ³ /min	ft ³ /hr	gal/min	US brl/d
1	60	3.6	2.119093	127.1197	15.85037	543.4783
0.016666	1	0.06	0.035317	2.118577	0.264162	9.057609
0.277778	16.6667	1	0.588637	35.31102	4.40288	150.9661
0.4719	28.31513	1.69884	1	60	7.479791	256.4674
0.007867	0.472015	0.02832	0.01667	1	0.124689	4.275326
0.06309	3.785551	0.227124	0.133694	8.019983	1	34.28804
0.00184	0.110404	0.006624	0.003899	0.2339	0.029165	1

Table 8: Volumetric Gas Flow Units

Normal meter cube/hour	Standard cubic feet/hour	Standard cubic feet/minute
Nm ³ /hr	scfh	scfm
1	35.31073	0.588582
0.02832	1	0.016669
1.699	59.99294	1

Table 9: Mass Flow Units

Kilogram/hour	Pound/hour	Kilogram/second	Ton/hour
kg/h	lb/hour	kg/s	t/h
1	2.204586	0.000278	0.001
0.4536	1	0.000126	0.000454
3600	7936.508	1	3.6
1000	2204.586	0.277778	1

Table 10: High Pressure Units

Bar	Pound/square inch	Kilopascal	Megapascal	Kilogram force/centimeter square	Millimeter of mercury	Atmospheres
bar	psi	kPa	MPa	kgf/cm ²	mm Hg	atm
1	14.50326	100	0.1	1.01968	750.0188	0.987167
0.06895	1	6.895	0.006895	0.070307	51.71379	0.068065
0.01	0.1450	1	0.001	0.01020	7.5002	0.00987
10	145.03	1000	1	10.197	7500.2	9.8717
0.9807	14.22335	98.07	0.09807	1	735.5434	0.968115
0.001333	0.019337	0.13333	0.000133	0.00136	1	0.001316
1.013	14.69181	101.3	0.1013	1.032936	759.769	1

Table 11: Low Pressure Units

Meter of water	Foot of water	Centimeter of mercury	Inches of mercury	Inches of water	Pascal
mH ₂ O	ftH ₂ O	cmHg	inHg	inH ₂ O	Pa
1	3.280696	7.356339	2.896043	39.36572	9806
0.304813	1	2.242311	0.882753	11.9992	2989
0.135937	0.445969	1	0.39368	5.351265	1333
0.345299	1.13282	2.540135	1	13.59293	3386
0.025403	0.083339	0.186872	0.073568	1	249.1
0.000102	0.000335	0.00075	0.000295	0.004014	1

Table 12: Speed Units

Meter/second	Meter/minute	Kilometer/hour	Foot/second	Foot/minute	Miles/hour
m/s	m/min	km/h	ft/s	ft/min	mi/h
1	59.988	3.599712	3.28084	196.8504	2.237136
0.01667	1	0.060007	0.054692	3.281496	0.037293
0.2778	16.66467	1	0.911417	54.68504	0.621477
0.3048	18.28434	1.097192	1	60	0.681879
0.00508	0.304739	0.018287	0.016667	1	0.011365
0.447	26.81464	1.609071	1.466535	87.99213	1

Table 13: Torque Units

Newton meter	Kilogram force meter	Foot pound	Inch pound
Nm	kgfm	ftlb	inlb
1	0.101972	0.737561	8.850732
9.80665	1	7.233003	86.79603
1.35582	0.138255	1	12
0.112985	0.011521	0.083333	1

Table 14: Dynamic Viscosity Units

Centipoise*	Poise	Pound/foot-second
cp	poise	lb/(ft·s)
1	0.01	0.000672
100	1	0.067197
1488.16	14.8816	1

Table 15: Kinematic Viscosity Units

Centistoke*	Stoke	Foot square/second	meter square/second
cs	St	ft ² /s	m ² /s
1	0.01	0.000011	0.000001
100	1	0.001076	0.0001
92903	929.03	1	0.092903
1000000	10000	10.76392	1

*note: centistokes x specific gravity = centipoise

Table 16: Temperature Conversion Formulas

Degree Celsius (°C)	(°F - 32) x 5/9
	(K - 273.15)
Degree Fahrenheit (°F)	(°C x 9/5) + 32
	(1.8 x K) - 459.67
Kelvin (K)	(°C + 273.15)
	(°F + 459.67) ÷ 1.8

CONVERSION TABLES

PRESSURE

To convert...	into...	Multiply by:
atm	bar	1.01325
	kg/cm ²	1.0332
	PSI	14.696
	MPa	0.101325
	KPa	101.325
bar	atm	0.98692
	kg/cm ²	1.01971
	PSI	14.504
	MPa	0.1
	KPa	100
kg/cm ²	atm	0.96784
	bar	0.98067
	PSI	14.223
	MPa	0.098067
	KPa	98.0665
MPa	atm	9.869232
	bar	10
	kg/cm ²	10.1971
	PSI	145.04
	KPa	1,000
KPa	atm	0.009869
	bar	0.01
	kg/cm ²	0.010197
	PSI	0.145037
	MPa	0.001
PSI	atm	0.068046
	bar	0.068947
	kg/cm ²	0.070307
	MPa	0.0068948
	KPa	6.89475

LINEAR

To convert...	into...	Multiply by:
cm	ft	0.032808
	in	0.3937
	metres	0.01
	microns	10,000
	mm	10
ft	cm	30.48
	in	12
	metres	0.3048
	microns	304,800
	mm	304.8
in	cm	2.54
	ft	0.08333
	metres	0.0254
	microns	25,400
	mm	25.4
metres	cm	100
	ft	3.28083
	in	39.37
	microns	1,000,000
	mm	1,000
microns	cm	0.0001
	ft	0.00003281
	in	0.00003937
	metres	0.000001
	mm	0.001
mm	cm	0.1
	ft	0.003281
	in	0.03937
	metres	0.001
	microns	1000

VOLUME

To convert...	into...	Multiply by:
cc	ft ³	0.00003531
	in ³	0.06102
	litre	0.001
	m ³	0.000001
	US quart	0.0010567
	US Gallon	0.0002642
ft ³	cc	28,317
	in ³	1728
	litre	28.317
	m ³	0.028317
	US quart	29.92
	US Gallon	7.4805
in ³	cc	16.387
	ft ³	0.0005787
	litre	0.016387
	m ³	0.0000163
	US quart	0.01732
	US Gallon	0.004329
litre	cc	1,000
	ft ³	0.03531
	in ³	61.023
	m ³	0.001
	US quart	1.057
	US Gallon	0.2642
m ³	cc	1,000,000
	ft ³	35.31
	in ³	61,023
	litre	1,000
	US quart	1056.8
	US Gallon	264.2
US quart	cc	946.25
	ft ³	0.03342
	in ³	57.75
	litre	0.9463
	m ³	0.0009463
	US Gallon	0.25
US Gallon	cc	3,785
	ft ³	0.1337
	in ³	231
	litre	3.785
	m ³	0.003785
	US quart	4

FLOW

To convert...	into...	Multiply by:
cc/min	ft ³ /min	0.0000353145
	gal/min US	0.0002642
	in ³ /min	0.061
	L/min	0.001
ft ³ /min	cc/min	28,320
	gal/min US	7.48
	in ³ /min	1728
	L/min	28.32
gal/min US	cc/min	3785.4
	ft ³ /min	0.1337
	in ³ /min	231
	L/min	3.7854
in ³ /min	cc/min	16.39
	ft ³ /min	0.00057
	L/min	0.016
	gal/min US	0.004
L/min	cc/min	1,000
	ft ³ /min	0.03531
	in ³ /min	61.02
	gal/min US	0.26417

AREA

To convert...	into...	Multiply by:
cm ²	ft ²	0.0010764
	in ²	0.155
	m ²	0.0001
	mm ²	100
ft ²	cm ²	929.0304
	in ²	144
	m ²	0.092903
	mm ²	92903.04
in ²	cm ²	6.4516
	ft ²	0.006944
	m ²	0.0006451
	mm ²	645.16
m ²	cm ²	10,000
	ft ²	10.76391
	in ²	1,550
	mm ²	1,000,000
mm ²	cm ²	0.01
	ft ²	0.000010764
	in ²	0.00155
	m ²	0.000001

TEMPERATURE

$$\text{deg F} = (\text{deg C} \times 1.8) + 32$$

$$\text{deg C} = (\text{deg F} - 32) / 1.8$$