

Conversion Factors for Common Engineering Units

to convert		into		multiply by
Length				
inches	in	millimetres	mm	25.4
feet	ft	metres	m	0.3048
Yards	yd	metres	m	0.9144
miles	mile	kilometres	km	1.609344
millimetres	mm	inches	in	0.0393701
metres	m	feet	ft	3.280840
kilometres	km	miles	mi	0.621371
Area				
square yards	yd ²	square metres	m ²	0.836127
square feet	ft ²	square metres	m ²	0.0929030
square inches	in ²	square millimetres	mm ²	645.16
square inches	in ²	square centimetres	cm ²	6.4516
square metres	m ²	square yards	yd ²	1.9599
square metres	m ²	square feet	ft ²	10.7639
square millimetres	mm ²	square inches	in ²	0.001550
square centimetres	cm ²	square inches	in ²	0.155000
Volume				
cubic inches	in ³	cubic centimetres	cm ³	16.3871
cubic inches	in ³	cubic decimetre*	dm ³	0.0163871
cubic feet	ft ³	cubic metres	m ³	0.0283168
cubic feet	ft ³	cubic decimetre*	dm ³	28.3168
UK gallon	gal	cubic decimetre*	dm ³	4.54609
cubic centimetres	cm ³	cubic inches	in ³	0.0610237
cubic decimetre*	dm ³	cubic inches	in ³	61.0237
cubic decimetre*	dm ³	cubic feet	ft ³	0.0353147
cubic decimetre*	dm ³	UK gallons	gal	0.219969
cubic metres	m ³	cubic feet	ft ³	35.3147
Velocity				
feet per second	ft/s	metre per second	m/s	0.3048
feet per second	ft/s	metres per minute	m/min	0.00508
feet per minute	ft/min	metres per second	m/sec	0.00508
feet per minute	ft/min	metres per minute	m/min	0.3048
miles per hour	mph	kilometres per hour	km/h	0.44704
metres per second	m/s	feet per second	ft/s	3.280840
metres per second	m/s	feet per minute	ft/min	0.054680
metres per minute	m/min	feet per second	ft/s	0.054680
metres per minute	m/min	feet per minute	ft/min	3.280840
kilometres per hour	km/h	miles per hour	mph	0.621371

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Mass				
pound	lb	kilograms	kg	0.45359237
UK ton	ton	tonne (1000 kg)	t	1.01605
ounce (avoir)	oz	gram	g	28.3495
kilogram	kg	pound	lb	2.20462
tonne (1000 kg)	t	UK ton	ton	0.984207
gram	g	ounce (avoir)	oz	0.035274
Mass Per Unit				
pounds per inch	lb/in	kilogram per metre	kg/m	17.8580
pounds per foot	lb/ft	kilogram per metre	kg/m	1.48816
kilogram per metre	kg/m	pound per inch	lb/in	0.055997
kilogram per metre	kg/m	pounds per foot	lb/ft	0.671969
Density				
pounds per cubic inch	lb/in ³	gram per cubic centimetre	g/cm ³	27.6799
pounds per cubic foot	lb/ft ³	kilogram per cubic metre	kg/m ³	0.0160185
ounce per UK gallon	oz/gal	gram per cubic metre	g/m ³	6236.03
ounce per UK gallon	oz/gal	milligram per litre	mg/l	6236.03
gram per cubic centimetre	g/cm ³	pound per cubic inch	lb/in ³	0.0361273
kilogram per cubic metre	kg/m ³	pound per cubic foot	lb/ft ³	62.428
gram per cubic metre	g/m ³	ounce per UK gallon	oz/gal	1.60359x10 ⁻⁴
milligram per litre	mg/l	ounce per UK gallon	oz/gal	1.60359x10 ⁻⁴
Force				
pound-force	lbf	newton	N	4.44822
ounce-force	ozf	newton	N	0.278014
poundal	pdl	newton	N	0.138255
kilogram-force	kgf	newton	N	9.80665
newton	N	kilogram-force	kgf	0.101972
newton	N	pound-force	lbf	0.224809
newton	N	ounce-force	ozf	3.59694
newton	N	poundal	pdl	7.23301
Torque (moment of force)				
pound-force foot	lbf.ft	newton metre	nm	1.35582
pound-force inch	lbf.in	newton metre	nm	0.112985
ounce-force inch	ozf.in	newton metre	nm	0.0070616
pound-force foot	lbf.ft	kilogram-force metre	kglm	0.138255
pound-force inch	lbf.in	kilogram-force metre	kglm	0.011521
newton metre	nm	pound-force foot	lbf.ft	0.737562
newton metre	nm	pound-force inch	lbf.in	8.85075
newton metre	nm	ounce-force inch	ozf.in	141.612

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Stress				
UK ton-force per square inch	tonf/in ²	newton per sq millimetre	N/mm ²	15.4443
UK ton-force per square inch	tonf/in ²	meganeutron per sq metre	MN/m ²	15.4443
UK ton-force per square inch	tonf/in ²	megapascal	MPa	15.4443
newton per square millimetre	N/mm ²	UK ton-force per sq inch	tonf/in ²	0.064749
meganeutron per square metre	MN/m ²	UK ton-force per sq inch	tonf/in ²	0.064749
megapascal	MPa	UK ton-force per sq inch	tonf/in ²	0.064749
Pressure				
pound-force per square inch	lbf/in ²	newton per square metre	N/mm ²	6894.76
pound-force per square inch	lbf/in ²	pascal	MPa	6894.76
pound-force per square inch	lbf/in ²	kilonewton per sq metre	kN/m ²	6.89476
inch of water	in H ₂ O	newton per square metre	N/m ²	2.59008
inch of mercury	in Hg	newton per square metre	N/m ²	35.21243
newton per square metre	N/m ²	pound-force per sq inch	lbf/in ²	1.45038x10 ⁻⁴
pascal	Pa	pound-force per sq inch	lbf/in ²	1.45038x10 ⁻⁴
kilonewton per sq metre	kN/m ²	pound-force per sq inch	lbf/in ²	0.145038
newton per sq metre	N/m ²	inch of water	in H ₂ O	0.38609
newton per square metre	N/m ²	inch of mercury	in Hg	0.028399
Energy				
kilowatt hour	kWh	joule	j	3.6x10 ⁶
foot poundal	ft pdl	joule	j	0.042140
foot pound-force	ft lbf	joule	j	1.35582
horse power hour	hph	joule	j	2.68452x10 ⁶
British thermal unit	Btu	joule	j	1055.06
horse power	hp	watt	W	745.700
joule	j	kilowatt hour	kWh	2.77778x10 ⁻⁷
joule	j	foot poundal	ft pdl	23.7304
joule	j	foot poundal-force	ft lbf	0.737562
joule	j	horse power hour	hph	3.72506 ⁻⁷
joule	j	British thermal unit	Btu	9.47817x10 ⁻⁴
watt	W	horse power	hp	1.34102x10 ⁻³

Notes:

Bold figures are exact conversions

*1 cubic decimetre = 1 litre

The litre is used for volumes of liquid & gas only