

Universal Conversion Factors

To convert units of one system into another, find the given units in the table and multiply by the appropriate conversion factor. For example:

To convert 26.5 centimeters into inches, find centimeters in the table, read across to inches and multiply by 0.3937.

$$26.5 \text{ cm} \times \frac{0.3937 \text{ inch}}{\text{cm}} = 10.4 \text{ inches}$$

To convert 8.75 inches into centimeters, find inches in the table, read across to centimeters and multiply by 2.540.

$$8.75 \text{ inches} \times \frac{2.540 \text{ cm}}{\text{inch}} = 22.2 \text{ cm}$$

TO CONVERT	INTO	MULTIPLY BY	TO CONVERT	INTO	MULTIPLY BY
A					
abcoulombs	statcoulombs	2.998×10^{10}	baryes	dynes/sq cm	1.000
acres	sq chains (Gunter's)	10	bolts (US cloth)	meters	36.576
acres	sq rods	160	Btu	liter—atmosphere	10.409
acres	square links (Gunter's)	1×10^5	Btu	ergs	1.0550×10^{10}
acres	hectares or sq hectometers	0.4047	Btu	foot-lb	778.3
acres	sq ft	43,560.0	Btu	gram-calories	252.0
acres	sq meters	4,047	Btu	horsepower-hr	3.931×10^{-4}
acres	sq miles	1.562×10^{-3}	Btu	joules	1,054.8
acres	sq yd	4,840	Btu	kilogram-calories	0.2520
acre-feet	cu ft	43,560.0	Btu	kilogram-meters	107.5
acre-feet	gallons	3.259×10^5	Btu	kilowatt-hr	2.928×10^{-4}
amperes/sq cm	amps/sq in	6.452	Btu/hr	foot-lb/sec	0.2162
amperes/sq cm	amps/sq meter	10^4	Btu/hr	gram-cal/sec	0.0700
amperes/sq in	amps/sq cm	0.1550	Btu/hr	horsepower-hr	3.929×10^{-4}
amperes/sq in	amps/sq meter	1,550.0	Btu/hr	watts	0.2931
amperes/sq meter	amps/sq cm	10^{-4}	Btu/min	foot-lb/sec	12.96
amperes/sq meter	amps/sq in	6.452×10^{-4}	Btu/min	horsepower	0.02356
ampere-hours	coulombs	3,600.0	Btu/min	kilowatts	0.01757
ampere-hours	faradays	0.03731	Btu/min	watts	17.57
ampere-turns	gilberts	1.257	Btu/min	watts/sq in	0.1221
ampere-turns/cm	amp-turns/in	2.540	Btu/sq ft/min	bucket (UK dry)	1.818×10^4
ampere-turns/cm	amp-turns/cm	100.0	bushels	cu ft	1,244.5
ampere-turns/cm	gilberts/cm	1.257	bushels	cu in	2,150.42
ampere-turns/in	amp-turns/cm	0.3937	bushels	cu meters	0.03524
ampere-turns/in	amp-turns/in	39.37	bushels	liters	35.24
ampere-turns/in	gilberts/cm	0.4950	bushels	pecks	4.0
ampere-turns/meter	amp-turns/cm	0.01	bushels	pints (dry)	64.0
ampere-turns/meter	amp-turns/in	0.0254	bushels	quarts (dry)	32.0
ampere-turns/meter	gilberts/cm	0.01257	C		
angstrom unit	inches	3937×10^{-9}	calories, gram (mean)	Btu (mean)	3.9685×10^{-3}
angstrom unit	meters	1×10^{-10}	candle/sq cm	lamberts	3.142
angstrom unit	microns or (μ)	1×10^{-4}	candle/sq inch	lamberts	0.4870
ares	acres (US)	0.02471	Celsius	Fahrenheit	$1.8^\circ\text{C} + 32$
ares	sq yd	119.60	centares (centiares)	sq meters	1.0
ares	acres	0.02471	centigrams	grams	0.01
ares	sq meters	100.0	centiliters	ounces (fl)	0.3382
astronomical units	kilometers	1.495×10^8	centiliters	cu in	0.6103
atmospheres	ton/sq in	0.007348	centiliters	drams	2.705
atmospheres	cm of mercury	76.0	centiliters	liters	0.01
atmospheres	mm of mercury	760.0	centimeters	feet	3.281×10^{-2}
atmospheres	torr	760.0	centimeters	inches	0.3937
atmospheres	ft of water (at 4°C)	33.90	centimeters	kilometers	10^{-5}
atmospheres	in of mercury (at 0°C)	29.92	centimeters	meters	0.01
atmospheres	kg/sq cm	1.0333	centimeters	miles	6.214×10^{-6}
atmospheres	kg/sq meter	10,332	centimeters	millimeters	10.0
atmospheres	lb/sq in	14.70	centimeters	mils	393.7
atmospheres	tons/sq ft	1.058	centimeters	yards	1.094×10^{-2}
B					
barrels (US, dry)	cu in	7056	centimeter-dynes	cm-grams	1.020×10^{-3}
barrels (US, dry)	quarts (dry)	105.0	centimeter-dynes	meter-kg	1.020×10^{-8}
barrels (US, liq)	gallons	31.5	centimeter-dynes	lb-ft	7.376×10^{-8}
barrels (oil)	gallons (oil)	42.0	centimeter-grams	cm-dynes	980.7
bars	atmospheres	0.9869	centimeter-grams	meter-kg	10^{-5}
bars	dynes/sq cm	10^6	centimeter-grams	lb-ft	7.233×10^{-5}
bars	kg/sq meter	1.020×10^4	centimeters of mercury	atmospheres	0.01316
bars	lb/sq ft	2,089	centimeters of mercury	ft of water	0.4461
bars	lb/sq in	14.50			

Universal Conversion Factors (Continued)

TO CONVERT	INTO	MULTIPLY BY	TO CONVERT	INTO	MULTIPLY BY
centimeters of mercury	kg/sq meter	136.0	cubic inches	bushels	4.650×10^{-4}
centimeters of mercury	lb/sq ft	27.85	cubic inches	cu cm	16.39
centimeters of mercury	lb/sq in	0.1934	cubic inches	cu ft	5.787×10^{-4}
centimeters/sec	ft/min	1.1969	cubic inches	cu meters	1.639×10^{-5}
centimeters/sec	ft/sec	0.03281	cubic inches	cu yards	2.143×10^{-5}
centimeters/sec	kilometers/hr	0.036	cubic inches	drams (fl)	4.4329
centimeters/sec	knots	0.1943	cubic inches	gallons (US)	4.329×10^{-3}
centimeters/sec	meters/min	0.6	cubic inches	gallons (UK)	3.605×10^{-3}
centimeters/sec	miles/hr	0.02237	cubic inches	gills	0.1385
centimeters/sec	miles/min	3.728×10^{-4}	cubic inches	liters	0.01639
centimeters/sec	ft/sec/sec	0.03281	cubic inches	milliliters	16.39
centimeters/sec/sec	km/hr/sec	0.036	cubic inches	mil-ft	1.061×10^5
centimeters/sec/sec	meters/sec/sec	0.01	cubic inches	minims	265.974
centimeters/sec/sec	miles/hr/sec	0.02237	cubic inches	ounces (fl)	0.5541
chain	inches	792.00	cubic inches	pecks	1.860×10^{-3}
chain	meters	20.12	cubic inches	pints (dry)	0.0298
chains (surveyors' or Gunter's)	yards	22.00	cubic inches	pints (liq)	0.03463
circular mils	sq cm	5.067×10^{-6}	cubic inches	quarts (dry)	0.0149
circular mils	sq mils	0.7854	cubic inches	quarts (liq)	0.01732
circular mils	sq in	7.854×10^{-7}	cubic meters	bushels	28.38
circumference	radians	6.283	cubic meters	cu cm	10^6
corde	cord ft	8	cubic meters	cu ft	35.31
cord feet	cu ft	16	cubic meters	cu in	61,023.74
coulomb	statcoulombs	2.998×10^9	cubic meters	cu yards	1.308
coulombs	faradays	1.036×10^{-5}	cubic meters	gallons (US)	264.2
coulombs/sq cm	coulombs/sq in	64.52	cubic meters	gallons (UK)	220.0
coulombs/sq cm	coulombs/sq meter	10^4	cubic meters	liters	1,000.0
coulombs/sq in	coulombs/sq cm	0.1550	cubic meters	milliliters	10^6
coulombs/sq in	coulombs/sq meter	1,550	cubic meters	pecks	113.51
coulombs/sq meter	coulombs/sq cm	10^{-4}	cubic meters	pints (dry)	1,816.166
coulombs/sq/meter	coulombs/sq in	6.452×10^{-4}	cubic meters	pints (liq)	2,113.0
cubic centimeters	cu ft	3.531×10^{-5}	cubic meters	quarts (dry)	908.083
cubic centimeters	cu in	0.06102	cubic meters	quarts (liq)	1.057
cubic centimeters	cu meters	10^{-6}	cubic yards	cu cm	7.646×10^5
cubic centimeters	cu yards	1.308×10^{-4}	cubic yards	cu ft	27.0
cubic centimeters	drams (fl)	0.2705	cubic yards	cu in	46,656.0
cubic centimeters	gallons (US)	2.642×10^{-4}	cubic yards	cu meters	0.7646
cubic centimeters	gills	8.454×10^{-3}	cubic yards	gallons (US)	202.0
cubic centimeters	liters	0.001	cubic yards	gallons (UK)	168.2
cubic centimeters	milliliters	1.0	cubic yards	liters	764.6
cubic centimeters	minims	16.231	cubic yards	milliliters	7.646×10^5
cubic centimeters	ounces (fl)	0.0338	cubic yards	pints (liq)	1,615.9
cubic centimeters	pints (liq)	2.113×10^{-3}	cubic yards	quarts (liq)	807.9
cubic centimeters	quarts (liq)	1.057×10^{-3}	cubic yards/min	cubic ft/sec	0.45
cubic feet	bushels	0.8036	cubic yards/min	gallons/sec	3.367
cubic feet	cu cm	28,316.85	cubic yards/min	liters/sec	12.74
cubic feet	cu in	1,728.0	D		
cubic feet	cu meters	0.02832	Dalton	gram	1.650×10^{-24}
cubic feet	cu yards	0.03704	days	seconds	86,400.0
cubic feet	drams (fl)	7660.05	decigrams	grams	0.1
cubic feet	gallons (US)	7.48052	deciliters	liters	0.1
cubic feet	gallons (UK)	6.229	decimeters	meters	0.1
cubic feet	gills	239.38	degrees (angle)	quadrants	0.01111
cubic feet	liters	28.32	degrees (angle)	radians	0.01745
cubic feet	milliliters	28,316.85	degrees (angle)	seconds	3,600.0
cubic feet	minims	459,603.1	degrees/sec	radians/sec	0.01745
cubic feet	ounces (fl)	957.51	degrees/sec	revolutions/min	0.1667
cubic feet	pecks	3,2143	degrees/sec	revolutions/sec	2.778×10^{-3}
cubic feet	pints (dry)	51.428	dekagrams	grams	10.0
cubic feet	pints (liq)	59.84	dekaliters	liters	10.0
cubic feet	quarts (dry)	25.714	dekameters	meters	10.0
cubic feet	quarts (liq)	29.92	drams (avdp)	drams (apoth)	0.4557
cubic feet/min	cu cm/sec	472.0	drams (avdp)	grains	27.3437
cubic feet/min	gallons/sec	0.1247	drams (avdp)	grams	1.7718
cubic feet/min	liters/sec	0.4720	drams (avdp)	kilograms	1.7718×10^{-3}
cubic feet/min	lb of water/min	62.43	drams (avdp)	milligrams	1771.85
cubic feet/sec	million gals/day	0.646317	drams (avdp)	ounces (apoth or troy)	0.0570
cubic feet/sec	gallons/min	448.831	drams (avdp)	ounces (avdp)	0.0625
			drams (avdp)	pennyweights	1.139

Universal Conversion Factors (Continued)

TO CONVERT	INTO	MULTIPLY BY	TO CONVERT	INTO	MULTIPLY BY
drams (avdp)	pounds (apoth or troy)	4.747×10^{-3}	faradays	coulombs	9.649×10^4
drams (avdp)	pounds (avdp)	3.906×10^{-3}	fathoms	meters	1.828804
drams (avdp)	scruples	1.367	feet	feet	6.0
drams (apoth)	drams (avdp)	2.1943	feet	centimeters	30.48
drams (apoth)	grains	60.0	feet	inches	12.0
drams (apoth)	grams	3.8879	feet	kilometers	3.048×10^{-4}
drams (apoth)	kilograms	3.888×10^{-3}	feet	meters	0.3048
drams (apoth)	milligrams	3887.93	feet	miles (nautical)	1.645×10^{-4}
drams (apoth)	ounces (apoth or troy)	0.125	feet	miles (statute)	1.894×10^{-4}
drams (apoth)	ounces (avdp)	0.1371429	feet	millimeters	304.8
drams (apoth)	pennyweights	2.5	feet	milis	1.2×10^4
drams (apoth)	pounds (apoth or troy)	0.0104	feet	yards	0.333
drams (apoth)	pounds (avdp)	8.571×10^{-3}	feet of water	atmospheres	0.02950
drams (apoth)	scruples	3.0	feet of water	in of mercury	0.8826
drams (fl)	cu cm	3.6967	feet of water	kg/sq cm	0.03048
drams (fl)	cu ft	1.3055×10^{-4}	feet of water	kg/sq meter	304.8
drams (fl)	cu in	0.2256	feet of water	lb/sq ft	62.43
drams (fl)	gallons (US)	9.7656×10^{-4}	feet of water	lb/sq in	0.4335
drams (fl)	gills	0.03125	feet/min	cm/sec	0.5080
drams (fl)	liters	3.6967×10^{-3}	feet/min	feet/sec	0.01667
drams (fl)	milliliters	3.6967	feet/min	km/hr	0.01829
drams (fl)	minims	60.0	feet/min	meters/min	0.3048
drams (fl)	ounces (fl)	0.125	feet/min	miles/hr	0.01136
drams (fl)	pints (liq)	7.8125×10^{-3}	feet/sec	cm/sec	30.48
drams (fl)	quarts (liq)	3.9063×10^{-3}	feet/sec	km/hr	1.097
dynes	grams	1.020×10^{-3}	feet/sec	knots	0.5921
dynes	joules/cm	10^{-7}	feet/sec	meters/min	18.29
dynes	joules/meter (newtons)	10^{-5}	feet/sec	miles/hr	0.6818
dynes	kilograms	1.020×10^{-6}	feet/sec	miles/min	0.01136
dynes	poundals	7.233×10^{-5}	feet/sec/sec	cm/sec/sec	30.48
dynes	pounds	2.248×10^{-6}	feet/sec/sec	km/hr/sec	1.097
dynes/cm	ergs/sq mm	.01	feet/sec/sec	meters/sec/sec	0.3048
dynes/sq cm	atmospheres	9.869×10^{-7}	feet/100 feet	miles/hr/sec	0.6818
dynes/sq cm	bars	10^{-6}	foot-candles	lumens/sq meter	10.764
dynes/sq cm	in of mercury	2.953×10^{-5}	foot-pounds	Btu	1.286×10^{-3}
dynes/sq cm	in of water at 4°C	4.015×10^{-4}	foot-pounds	ergs	1.356×10^7
	E		foot-pounds	gram-calories	0.3238
ell	cm	114.30	foot-pounds	hp-hr	5.050×10^{-7}
ell	inches	45	foot-pounds	joules	1.356
em, pica	inches	.167	foot-pounds	kg-calories	3.24×10^{-4}
em, pica	cm	.4233	foot-pounds	kg-meters	0.1383
ergs	Btu	9.480×10^{-11}	foot-pounds	kilowatt-hr	3.766×10^{-7}
ergs	dyne-centimeters	1.0	foot-pounds/min	Btu/min	1.286×10^{-3}
ergs	foot-lb	7.367×10^{-8}	foot-pounds/min	foot-lb/sec	0.01667
ergs	gram-calories	0.2389×10^{-7}	foot-pounds/min	horsepower	3.030×10^{-5}
ergs	gram-cm	1.020×10^{-3}	foot-pounds/min	kg-calories/min	3.24×10^{-4}
ergs	horsepower-hr	3.7250×10^{-14}	foot-pounds/min	kilowatts	2.260×10^{-5}
ergs	joules	10^{-7}	foot-pounds/min	Btu/hr	4.6263
ergs	kg-calories	2.389×10^{-11}	foot-pounds/sec	Btu/min	0.07717
ergs	kg-meters	1.020×10^{-8}	foot-pounds/sec	horsepower	1.818×10^{-3}
ergs	kilowatt-hr	0.2778×10^{-13}	foot-pounds/sec	kg-calories/min	0.01945
ergs	watt-hr	0.2778×10^{-10}	foot-pounds/sec	kilowatts	1.356×10^{-3}
ergs/sec	Btu/min	5.688×10^{-6}	furlongs	miles (US)	0.125
ergs/sec	dyne-cm/sec	1.000	furlongs	rods	40.0
ergs/sec	ft-lb/min	4.427×10^{-6}		feet	660.0
ergs/sec	ft-lb/sec	7.3756×10^{-8}	G		
ergs/sec	horsepower	1.341×10^{-10}	gallons (US)	cu cm	3,785.0
ergs/sec	kg-calories/min	1.433×10^{-9}	gallons (US)	cu ft	0.1337
ergs/sec	kilowatts	10^{-10}	gallons (US)	cu in	231.0
	F		gallons (US)	cu meters	3.785×10^{-3}
Fahrenheit	Celsius	$0.556^\circ\text{F} - 17.8$	gallons (US)	cu yards	4.951×10^{-3}
farads	microfarads	10^6	gallons (US)	drams (fl)	1024.0
faradays/sec	ampere (abs)	9.6500×10^4	gallons (US)	gallons (UK)	0.83267
faradays	ampere-hr	26.80	gallons (US)	gills	32.0
			gallons (US)	liters	3.785
			gallons (US)	milliliters	3,785.0
			gallons (US)	minims	61,440.0
			gallons (US)	ounces (fl)	128.0
			gallons (US)	pints (liq)	8.0

Universal Conversion Factors (Continued)

TO CONVERT	INTO	MULTIPLY BY	TO CONVERT	INTO	MULTIPLY BY
gallons (US)	quarts (liq)	4.0	grams	tons (short)	1.102×10^{-6}
gallons (UK)	cu ft	0.1605	grams/cm	lb/in	5.600×10^{-3}
gallons (UK)	cu in	277.4	grams/cu cm	lb/cu ft	62.43
gallons (UK)	cu meters	4.546×10^{-3}	grams/cu cm	lb/cu in	0.03613
gallons (UK)	cu yards	5.946×10^{-3}	grams/cu cm	lb/mil-ft	3.405×10^{-7}
gallons (UK)	gallons (US)	1.20095	grams/liter	grains/gal	58.417
gallons (UK)	liters	4.546	grams/liter	lb/1,000 gal	8.345
gallons of water	lb of water	8.3453	grams/liter	lb/cu ft	0.062427
gallons/min	cu ft/sec	2.228×10^{-3}	grams/liter	parts/million	1,000.0
gallons/min	liters/sec	0.06308	grams/sq cm	lb/sq ft	2.0481
gallons/min	cu ft/hr	8.0208	gram-calories	Btu	3.9683×10^{-3}
gauss	lines/sq in	6.452	gram-calories	ergs	4.1868×10^7
gauss	webers/sq cm	10^{-8}	gram-calories	ft-lb	3.0880
gauss	webers/sq in	6.452×10^{-8}	gram-calories	horsepower-hr	1.5596×10^{-6}
gauss	webers/sq meter	10^{-4}	gram-calories	kilowatt-hr	1.1630×10^{-6}
gilberts	ampere-turns	0.7958	gram-calories	watt-hr	1.1630×10^{-3}
gilberts/cm	amp-turns/cm	0.7958	gram-calories/sec	Btu/hr	14.286
gilberts/cm	amp-turns/in	2.021	gram-centimeters	Btu	9.297×10^{-8}
gilberts/cm	amp-turns/meter	79.58	gram-centimeters	ergs	980.7
gills	cu cm	118.2941	gram-centimeters	joules	9.807×10^{-5}
gills	cu ft	4.1775×10^{-3}	gram-centimeters	kg-cal	2.343×10^{-8}
gills	cu in	7.21875	gram-centimeters	kg-meters	10^{-5}
gills	drams (fl)	32.0			
gills	gallons (US)	0.03125		H	
gills	liters	0.1183	hand	cm	10.16
gills	milliliters	118.2941	hectares	acres	2.471
gills	minims	1920.0	hectares	sq ft	1.076×10^5
gills	ounces (fl)	4.0	hectograms	grams	100.0
gills	pints (liq)	0.25	hectoliters	liters	100.0
gills	quarts (liq)	0.125	hectometers	meters	100.0
gills (UK)	cu cm	142.07	hectowatts	watts	100.0
grade	radian	0.01571	henries	millihenries	1,000.0
grains	drams (apoth)	0.0167	hogsheads (UK)	cu ft	10.114
grains	drams (avdp)	0.03657143	hogsheads (US)	cu ft	8.42184
grains	grams	0.0648	hogsheads (US)	gallons (US)	63
grains	kilograms	6.479×10^{-5}	horsepower	Btu/min	42.44
grains	milligrams	64.799	horsepower	ft-lb/min	33,000
grains	ounces (apoth or troy)	2.083×10^{-3}	horsepower	ft-lb/sec	550.0
grains	ounces (avdp)	2.286×10^{-3}	horsepower	horsepower (metric)	1.014
grains	pennyweights	0.04167	horsepower	kg-calories/min	10.68
grains	pounds (apoth or troy)	1.736×10^{-4}	horsepower	kilowatts	0.7457
grains	pounds (avdp)	1.423×10^{-4}	horsepower	watts	745.7
grains	scruples	0.05	horsepower (boiler)	Btu/hr	33,479
grains (troy)	grams (avdp)	1.0	horsepower (boiler)	kilowatts	9.803
grains (troy)	grams	0.06480	horsepower (metric)	horsepower	0.9863
grains (troy)	ounces (avdp)	2.286×10^{-3}	horsepower (metric)	ft-lb/sec	542.5
grains (troy)	pennyweight (troy)	0.04167	horsepower-hours	Btu	2,547
grains/US gal	parts/million	17.118	horsepower-hours	ergs	2.6845×10^{13}
grains/US gal	lb/million gal	142.86	horsepower-hours	ft-lb	1.98×10^6
grains/UK gal	parts/million	14.286	horsepower-hours	gm-cal	641,190
grams	drams (apoth)	0.2572	horsepower-hours	joules	2.684×10^6
grams	drams (avdp)	0.5644	horsepower-hours	kg-calories	641.1
grams	dynes	980.7	horsepower-hours	kg-meters	2.737×10^3
grams	grains	15.43	horsepower-hours	kilowatt-hr	0.7457
grams	joules/cm	9.807×10^{-5}	hours	days	4.167×10^{-2}
grams	joules/meter		hours	weeks	5.952×10^{-3}
grams	(newtons)	9.807×10^{-3}	hundredweights		
grams	kilograms	0.001	(long)	cwt (short)	1.12
grams	milligrams	1,000.0	hundredweights	(long)	
grams	ounces (apoth or troy)	0.03215	hundredweights	kilograms	50.802
grams	ounces (avdp)	0.03527	hundredweights	(long)	
grams	pennyweights	0.643	hundredweights	ounces	1792.0
grams	pounds (apoth or troy)	2.679×10^{-3}	hundredweights	(long)	
grams	pounds (avdp)	2.205×10^{-3}	hundredweights	pounds	112
grams	poundals	0.07093	hundredweights	(long)	
grams	scruples	0.7716	hundredweights	slugs	3.4811
grams	slugs	6.852×10^{-5}	hundredweights	(long)	
			hundredweights	tons (long)	0.05
			(long)	tons (short)	0.056

Universal Conversion Factors (Continued)

TO CONVERT	INTO	MULTIPLY BY	TO CONVERT	INTO	MULTIPLY BY
hundredweights (short)	cwt (short)	0.8929	kilograms	joules/meters (newtons)	9.807
hundredweights (short)	kilograms	45.359	kilograms	milligrams	10 ⁶
hundredweights (short)	ounces	1600.0	kilograms	ounces (apoth or troy)	32.151
hundredweights (short)	pounds	100.0	kilograms	ounces (avdp)	35.274
hundredweights (short)	slugs	3.1081	kilograms	pennyweights	643.015
hundredweights (short)	tons (metric)	0.0453592	kilograms	pounds (apoth or troy)	2.679
hundredweights (short)	tons (long)	0.0446429	kilograms	pounds (avdp)	2.205
hundredweights (short)	tons (short)	0.05	kilograms	poundals	70.93
	I		kilograms	scruples	771.62
inches	centimeters	2.540	kilograms	slugs	0.0685
inches	feet	0.0833	kilograms	tons (metric)	0.001
inches	meters	2.540×10^{-2}	kilograms	tons (long)	9.842×10^{-4}
inches	miles	1.578×10^{-5}	kilograms	tons (short)	1.102×10^{-3}
inches	miles (naut)	1.3715×10^{-5}	kilograms/cu meter	gm/cu cm	0.001
inches	millimeters	25.40	kilograms/cu meter	lb/cu ft	0.06243
inches	mils	1,000.0	kilograms/cu meter	lb/cu in	3.613×10^{-5}
inches	yards	2.778×10^{-2}	kilograms/cu meter	lb/mil-foot	3.405×10^{-10}
inches of mercury	atmospheres	0.03342	kilograms/meter	lb/ft	0.6720
inches of mercury	ft of water	1.133	kilograms/sq cm	dynes	980,665
inches of mercury	kg/sq cm	0.03453	kilograms/sq cm	atmospheres	0.9678
inches of mercury	kg/sq meter	345.3	kilograms/sq cm	ft of water	32.81
inches of mercury	lb/sq ft	70.73	kilograms/sq cm	in of mercury	28.96
inches of mercury	lb/sq in	0.4912	kilograms/sq cm	lb/sq ft	2,048
inches of water (at 4°C)	atmospheres	2.458×10^{-3}	kilograms/sq cm	lb/sq in	14.22
inches of water (at 4°C)	in of mercury	0.07355	kilograms/sq meter	atmospheres	9.678×10^{-5}
inches of water (at 4°C)	kg/sq cm	2.540×10^{-3}	kilograms/sq meter	bars	9.807×10^{-5}
inches of water (at 4°C)	oz/sq in	0.5781	kilograms/sq meter	ft of water	3.281×10^{-3}
inches of water (at 4°C)	lb/sq ft	5.204	kilograms/sq meter	in of mercury	2.896×10^{-3}
inches of water (at 4°C)	lb/sq in	0.03613	kilograms/sq meter	lb/sq ft	0.2048
international ampere	ampere (abs)	.9998	kilograms/sq meter	lb/sq in	1.422×10^{-3}
international volt	volts (abs)	1.0003	kilograms/sq mm	kg/sq meter	10 ⁶
international volt	joules	9.654×10^4	kilograms-calories	Btu	3.968
	J		kilogram-calories	ft-lb	3,088
joules	Btu	9.480×10^{-4}	kilogram-calories	hp-hr	1.560×10^{-3}
joules	ergs	10 ⁷	kilogram-calories	joules	4,186
joules	ft-lb	0.7376	kilogram-calories	kg-meters	426.9
joules	kg-calories	2.389×10^{-4}	kilogram-calories	kilojoules	4.186
joules	kg-meters	0.1020	kilogram-calories	kilowatt-hr	1.163×10^{-3}
joules	watt-hr	2.778×10^{-4}	kilogram-calories	Btu	9.294×10^{-3}
joules/cm	grams	1.020×10^4	kilogram-meters	Btu	9.294×10^{-3}
joules/cm	dynes	10 ⁷	kilogram-meters	ergs	9.804×10^7
joules/cm	joules/meter		kilogram-meters	ft-lb	7.233
	(newtons)	100.0	kilogram-meters	joules	9.804
joules/cm	poundals	723.3	kilogram-meters	kg-calories	2.342×10^{-3}
joules/cm	pounds	22.48	kilogram-meters	kilowatt-hr	2.723×10^{-6}
	K		kilolines	maxwells	1,000.0
kilograms	cwt (long)	0.0197	kiloliters	liters	1,000.0
kilograms	cwt (short)	0.022	kilometers	centimeters	10 ⁵
kilograms	drams (apoth)	257.21	kilometers	feet	3,281
kilograms	drams (avdp)	564.38	kilometers	inches	3.937×10^4
kilograms	dynes	980,665	kilometers	meters	1,000.0
kilograms	grains	15,432.36	kilometers	miles	0.6214
kilograms	grams	1000.0	kilometers	millimeters	10 ⁶
kilograms	joules/cm	0.09807	kilometers	yards	1,094
			kilometers/hr	cm/sec	27.78
			kilometers/hr	ft/min	54.68
			kilometers/hr	ft/sec	0.9113
			kilometers/hr	knots	0.5396
			kilometers/hr	meters/min	16.67
			kilometers/hr	miles/hr	0.6214
			kilometers/hr/sec	cm/sec/sec	27.78
			kilometers/hr/sec	ft/sec/sec	0.9113
			kilometers/hr/sec	meters/sec/sec	0.2778
			kilometers/hr/sec	miles/hr/sec	0.6214
			kilowatts	Btu/min	56.92
			kilowatts	foot-lb/min	4.426×10^4
			kilowatts	foot-lb/sec	737.6
			kilowatts	horsepower	1.341
			kilowatts	kg-calories/min	14.34

Universal Conversion Factors (Continued)

TO CONVERT	INTO	MULTIPLY BY	TO CONVERT	INTO	MULTIPLY BY
milligrams	pounds (apoth or troy)	2.679×10^{-6}	ounces (avdp)	milligrams	28,349.5
milligrams	pounds (avdp)	2.2046×10^{-6}	ounces (avdp)	ounces (apoth or troy)	0.9115
milligrams	scruples	7.7162×10^{-4}	ounces (avdp)	pennyweights	18.23
milligrams/liter	parts/million	1.0	ounces (avdp)	pounds (apoth or troy)	0.0759
millihenries	henries	0.001	ounces (avdp)	pounds (avdp)	0.0625
milliliters	cu cm	1.0	ounces (avdp)	scruples	21.875
milliliters	cu ft	3.531×10^{-5}	ounces (avdp)	slugs	1.9426×10^{-3}
milliliters	cu in	0.06102	ounces (avdp)	tons (long)	2.790×10^{-5}
milliliters	drams (fl)	0.2705	ounces (avdp)	tons (metric)	2.835×10^{-5}
milliliters	gallons (US)	2.642×10^{-4}	ounces (avdp)	tons (short)	3.125×10^{-5}
milliliters	gills	8.454×10^{-3}	ounces (avdp)		
milliliters	liters	0.001	ounces (apoth or troy)	drams (apoth)	8.0
milliliters	minims	16.231	ounces (apoth or troy)	drams (avdp)	17.554
milliliters	ounces (fl)	0.0338	ounces (apoth or troy)	grains	480.0
milliliters	pints (liq)	2.113×10^{-3}	ounces (apoth or troy)	grams	31.103481
milliliters	quarts (liq)	1.057×10^{-3}	ounces (apoth or troy)	kilograms	0.0311
millimeters	centimeters	0.1	ounces (apoth or troy)	milligrams	31,103.48
millimeters	feet	3.281×10^{-3}	ounces (apoth or troy)	ounces (avdp)	1.09714
millimeters	inches	0.03937	ounces (apoth or troy)	pennyweights	20.0
millimeters	kilometers	10^{-6}	ounces (apoth or troy)	pounds (apoth or troy)	0.08333
millimeters	meters	0.001	ounces (apoth or troy)	pounds (avdp)	0.0686
millimeters	miles	6.214×10^{-7}	ounces (fl)	scruples	24.0
millimeters	mils	39.37	ounces (fl)	cu cm	29.5735
millimeters	yards	1.094×10^{-3}	ounces (fl)	cu ft	1.0444×10^{-3}
millimeters of Hg	atmospheres	1.316×10^{-3}	ounces (fl)	cu in	1.805
millimeters of Hg	torr	1.0	ounces (fl)	drams (fl)	8.0
millimicrons	meters	1×10^{-9}	ounces (fl)	gallons (US)	7.8125×10^{-3}
million gals/day	cu ft/sec	1.54723	ounces (fl)	gills	0.25
mils	centimeters	2.540×10^{-3}	ounces (fl)	liters	0.02957
mils	feet	8.333×10^{-5}	ounces (fl)	milliliters	29.5735
mils	inches	0.001	ounces (fl)	minims	480.0
mils	kilometers	2.540×10^{-8}	ounces (fl)	pints (liq)	0.0625
mils	yards	2.778×10^{-5}	ounces (fl)	quarts (liq)	0.03125
miner's inches	cu ft/min	1.5	ounces (sq in)	dynes/sq cm	4309
minims (UK)	cu cm	0.059192	ounces/sq in	pounds/sq in	0.0625
minims	cu cm	0.061612			
minims	cu ft	2.176×10^{-6}			
minims	cu in	3.7598×10^{-3}			
minims	drams (fl)	0.0167			
minims	gallons (US)	1.628×10^{-5}			
minims	gills	5.208×10^{-4}			
minims	liters	6.161×10^{-5}			
minims	milliliters	0.061612			
minims	ounces (fl)	0.0021			
minims	pints (liq)	1.302×10^{-4}			
minims (liq)	quarts (liq)	6.51×10^{-5}			
minutes (angles)	degrees	0.01667			
minutes (angles)	quadrants	1.852×10^{-4}			
minutes (angles)	radians	2.909×10^{-4}			
minutes (angles)	seconds	60.0			
myriagrams	kilograms	10.0			
myriameters	kilometers	10.0			
myriawatts	kilowatts	10.0			
	N				
nepers	decibels	8.686			
newtons	dynes	1×10^5			
	O				
ohm (Int)	ohm (abs)	1.0005			
ohms	megohms	10^{-6}			
ohms	microhms	10^6			
ounces (avdp)	cwt (long)	5.5804×10^{-4}			
ounces (avdp)	cwt (short)	6.25×10^{-4}			
ounces (avdp)	drams (apoth)	7.292			
ounces (avdp)	drams (avdp)	16.0			
ounces (avdp)	grains	437.5			
ounces (avdp)	grams	28.349527			
ounces (avdp)	kilograms	0.0283			
				P	
			parsecs	miles	19×10^{12}
			parsecs	kilometers	3.084×10^{13}
			parts/million	grains/US gal	0.0584
			parts/million	grains/UK gal	0.07016
			parts/million	lb/million gal	8.345
			pecks (UK)	cu in	554.6
			pecks (UK)	liters	9.091901
			pecks	bushels	0.25
			pecks	cu ft	0.3111
			pecks	cu in	537.605
			pecks	cu meters	8.8098×10^{-3}
			pecks	liters	8.8098
			pecks	pints (dry)	16.0
			pecks	quarts (dry)	8.0
			pennyweights	drams (apoth)	0.4
			pennyweights	drams (avdp)	0.8777
			pennyweights	grains	24.0
			pennyweights	grams	1.55517
			pennyweights	kilograms	1.555×10^{-3}
			pennyweights	milligrams	1,555.17
			pennyweights	ounces (apoth or troy)	0.05

Universal Conversion Factors (Continued)

TO CONVERT	INTO	MULTIPLY BY	TO CONVERT	INTO	MULTIPLY BY
pennyweights	ounces (avdp)	0.0549	pounds (apoth or troy)	ounces (apoth or troy)	12.0
pennyweights	pounds (apoth or troy)	4.1667×10^{-3}	pounds (apoth or troy)	ounces (avdp)	13.1657
pennyweights	pounds (avdp)	3.428×10^{-3}	pounds (apoth or troy)	pennyweights	240.0
pennyweights	scruples	1.2	pounds (apoth or troy)	pounds (avdp)	0.822857
pints (dry)	bushels	0.0156	pounds (apoth or troy)	scruples	288.0
pints (dry)	cu ft	0.0194	pounds (apoth or troy)	tons (long)	3.6753×10^{-4}
pints (dry)	cu in	33.60	pounds (apoth or troy)	tons (metric)	3.7324×10^{-4}
pints (dry)	cu meters	5.506×10^{-4}	pounds (apoth or troy)	tons (short)	4.1143×10^{-4}
pints (dry)	liters	0.5506	pounds of water	cu ft	0.01602
pints (dry)	pecks	0.0625	pounds of water	cu in	27.68
pints (dry)	quarts (dry)	0.5	pounds of water	gallons	0.1198
pints (liq)	cu cm	473.2	pounds of water/min	cu ft/sec	2.670×10^{-4}
pints (liq)	cu ft	0.01671	pound-feet	cm-dynes	1.356×10^7
pints (liq)	cu in	28.875	pound-feet	cm-gm	13,825
pints (liq)	cu meters	4.732×10^{-4}	pound-feet	meter-kg	0.1383
pints (liq)	cu yards	6.189×10^{-4}	pounds/cu ft	gm/cu cm	0.01602
pints (liq)	drams (fl)	128.0	pounds/cu ft	kg/cu meter	16.02
pints (liq)	gallons (US)	0.125	pounds/cu ft	lb/cu in	5.787×10^{-4}
pints (liq)	gills	4.0	pounds/cu ft	lb/mil-foot	5.456×10^{-9}
pints (liq)	liters	0.4732	pounds/cu in	gm/cu cm	27.68
pints (liq)	milliliters	473.2	pounds/cu in	kg/cu meter	2.768×10^4
pints (liq)	minims	7680.0	pounds/cu in	lb/cu ft	1,728
pints (liq)	ounces (fl)	16.0	pounds/cu in	lb/mil-foot	9.425×10^{-6}
pints (liq)	quarts (liq)	0.5	pounds/ft	kg/meter	1.488
Planck's quantum	erg-sec	6.624×10^{-27}	pounds/in	gm/cm	178.6
poise	gm/cm sec	1.00	pounds/mil-foot	gm/cu cm	2.306×10^6
poundals	dynes	13.826	pounds/sq ft	atmospheres	4.725×10^{-4}
poundals	grams	14.10	pounds/sq ft	ft of water	0.01602
poundals	joules/cm	1.383×10^{-3}	pounds/sq ft	in of mercury	0.01414
poundals	joules/meter (newtons)	0.1383	pounds/sq ft	kg/sq meter	4.882
poundals	kilograms	0.01410	pounds/sq ft	lb/sq in	6.944×10^{-3}
poundals	pounds	0.03108	pounds/sq ft	atmospheres	0.06804
pounds (avdp)	cwt (long)	8.929×10^{-3}	pounds/sq in	ft of water	2.307
pounds (avdp)	cwt (short)	0.01	pounds/sq in	in of mercury	2.036
pounds (avdp)	drams (apoth)	116.67	pounds/sq in	kg/sq meter	703.1
pounds (avdp)	drams (avdp)	256.0	pounds/sq in	lb/sq ft	144.0
pounds (avdp)	dynes	44.4823×10^4			
pounds (avdp)	grains	7,000.0			
pounds (avdp)	grams	453.5924			
pounds (avdp)	joules/cm	0.04448			
pounds (avdp)	joules/meter (newtons)	4.448			
pounds (avdp)	kilograms	0.4536			
pounds (avdp)	milligrams	453,592.37			
pounds (avdp)	ounces (apoth or troy)	14.5833			
pounds (avdp)	ounces (avdp)	16.0			
pounds (avdp)	pennyweights	291.667			
pounds (avdp)	poundals	32.17			
pounds (avdp)	pounds (apoth or troy)	1.21528			
pounds (avdp)	scruples	350.0			
pounds (avdp)	slugs	3.108×10^{-2}			
pounds (avdp)	tons (long)	4.464×10^{-4}			
pounds (avdp)	tons (metric)	4.536×10^{-4}			
pounds (avdp)	tons (short)	5.0×10^{-4}			
pounds (apoth or troy)	drams (apoth)	96.0			
pounds (apoth or troy)	drams (avdp)	210.65			
pounds (apoth or troy)	grains	5,760.0			
pounds (apoth or troy)	grams	373.2417			
pounds (apoth or troy)	kilograms	0.3732			
pounds (apoth or troy)	milligrams	373,241.72			
				Q	
			quadrants (angle)	degrees	90.0
			quadrants (angle)	minutes	5,400.0
			quadrants (angle)	radians	1.571
			quadrants (angle)	seconds	3.24×10^5
			quarts (dry)	bushels	0.0313
			quarts (dry)	cu ft	0.0389
			quarts (dry)	cu in	67.20
			quarts (dry)	cu meters	1.101×10^{-3}
			quarts (dry)	liters	1.1012
			quarts (dry)	pecks	0.125
			quarts (dry)	pints (dry)	2.0
			quarts (liq)	cu cm	946.4
			quarts (liq)	cu ft	0.03342
			quarts (liq)	cu in	57.75
			quarts (liq)	cu meters	9.464×10^{-4}
			quarts (liq)	cu yards	1.238×10^{-3}
			quarts (liq)	drams (fl)	256.0
			quarts (liq)	gallons (US)	0.25
			quarts (liq)	gills	8.0
			quarts (liq)	liters	0.9464
			quarts (liq)	milliliters	946.4
			quarts (liq)	minims	15,360.0
			quarts (liq)	ounces (fl)	32.0
			quarts (liq)	pints (liq)	2.0

Universal Conversion Factors (Continued)

TO CONVERT	INTO	MULTIPLY BY	TO CONVERT	INTO	MULTIPLY BY
R					
radians	degrees	57.30	square feet	sq miles	3.587×10^{-8}
radians	minutes	3,438	square feet	sq mm	9.290×10^4
radians	quadrants	0.6366	square feet	sq yd	0.1111
radians	seconds	2.063×10^5	square inches	circular mils	1.273×10^6
radians/sec	degrees/sec	57.30	square inches	sq cm	6.452
radians/sec	rev/min	9.549	square inches	sq ft	6.944×10^{-3}
radians/sec	rev/sec	0.1592	square inches	sq mm	645.2
radians/sec/sec	rev/min/min	573.0	square inches	sq mils	10^6
radians/sec/sec	rev/min/sec	9.549	square inches	sq yd	7.716×10^{-4}
radians/sec/sec	rev/sec/sec	0.1592	square kilometers	acres	247.1
revolutions	degrees	360.0	square kilometers	sq cm	10^{10}
revolutions	quadrants	4.0	square kilometers	sq ft	1.076×10^7
revolutions	radians	6.283	square kilometers	sq in	1.550×10^9
revolutions/min	degrees/sec	6.0	square kilometers	sq meters	10^6
revolutions/min	radians/sec	0.1047	square kilometers	sq miles	0.3861
revolutions/min	rev/sec	0.01667	square kilometers	sq yd	1.196×10^9
revolutions/min/min	radians/sec/sec	1.745×10^{-3}	square meters	acres	2.471×10^{-4}
revolutions/min/min	rev/min/sec	0.01667	square meters	sq cm	10^4
revolutions/min/min	rev/sec/sec	2.778×10^{-4}	square meters	sq ft	10.76
revolutions/sec	degrees/sec	360.0	square meters	sq in	1,550
revolutions/sec	radians/sec	6.283	square meters	sq miles	3.861×10^{-7}
revolutions/sec	rev/min	60.0	square meters	sq mm	10^6
revolutions/sec/sec	radians/sec/sec	6.283	square meters	sq yd	1.196
revolutions/sec/sec	rev/min/min	3,600.0	square miles	acres	640.0
revolutions/sec/sec	rev/min/sec	60.0	square miles	sq ft	2.788×10^7
rods	chain (Gunter's)	0.25	square miles	sq km	2.590
rods	meters	5.029	square miles	sq meters	2.590×10^6
rods (surveyors' measure)	yards	5.5	square miles	sq yd	3.098×10^6
rods	feet	16.5	square millimeters	circular mils	1,973
S					
scruples	drams (apoth)	0.3333	square millimeters	sq cm	0.01
scruples	drams (avdp)	0.7314	square millimeters	sq ft	1.076×10^{-5}
scruples	grains	20.0	square millimeters	sq in	1.550×10^{-3}
scruples	grams	1.296	square mils	circular mils	1.273
scruples	kilograms	1.296×10^{-3}	square mils	sq cm	6.452×10^{-6}
scruples	milligrams	1295.97	square mils	sq in	10^{-6}
scruples	ounces (apoth or troy)	0.0417	square yards	acres	2.066×10^{-4}
scruples	ounces (avdp)	0.0457	square yards	sq cm	8,361
scruples	pennyweights	0.8333	square yards	sq ft	9.0
scruples	pounds (apoth or troy)	3.472×10^{-3}	square yards	sq in	1,296
scruples	pounds (avdp)	2.857×10^{-3}	square yards	sq meters	0.8361
seconds (angle)	degrees	2.778×10^{-4}	square yards	sq miles	3.228×10^{-7}
seconds (angle)	minutes	0.01667	square yards	sq mm	8.361×10^5
seconds (angle)	quadrants	3.087×10^{-6}	temperature (°C)	absolute temperature (K)	1.0
seconds (angle)	radians	4.848×10^{-6}	+273		
slugs	cwt (long)	0.2873	temperature (°C)	temperature (°F)	1.8
slugs	cwt (short)	0.3217	+17.78		
slugs	grams	1.459×10^4	temperature (°F)	absolute temperature (°Rank)	1.0
slugs	kilograms	14.59	+460		
slugs	ounces (avdp)	514.79	temperature (°F)	temperature (°C)	5/9
slugs	pounds (avdp)	32.17	-32		
slugs	tons (long)	1.436×10^{-2}	tons (long)	cwt (long)	20
slugs	tons (short)	1.609×10^{-2}	tons (long)	cwt (short)	22.4
sphere	steradians	12.57	tons (long)	kilograms	1,016
square centimeters	circular mils	1.973×10^5	tons (long)	ounces (avdp)	35,840.0
square centimeters	sq ft	1.076×10^{-3}	tons (long)	pounds (avdp)	2,240.0
square centimeters	sq in	0.1550	tons (long)	slugs	69.621
square centimeters	sq meters	0.0001	tons (long)	tons (metric)	1.0160
square centimeters	sq miles	3.861×10^{-11}	tons (long)	tons (short)	1.120
square centimeters	sq mm	100.0	tons (metric)	cwt (short)	22.046
square centimeters	sq yd	1.196×10^{-4}	tons (metric)	kilograms	1,000.0
square feet	acres	2.296×10^{-5}	tons (metric)	ounces (avdp)	35,273.96
square feet	circular mils	1.833×10^8	tons (metric)	pounds (avdp)	2,205
square feet	sq cm	929.0	tons (metric)	tons (long)	0.9842
square feet	sq in	144.0	tons (metric)	tons (short)	1.1023
square feet	sq meters	0.09290	tons (short)	cwt (long)	17.857
			tons (short)	cwt (short)	20.0
			tons (short)	grams	9.072×10^5
			tons (short)	kilograms	907.1847

Universal Conversion Factors (Continued)

TO CONVERT	INTO	MULTIPLY BY	TO CONVERT	INTO	MULTIPLY BY
tons (short)	ounces (apoth or troy)	29,166.66	watts (abs)	Btu (mean)/min	0.056884
tons (short)	ounces (avdp)	32,000.0	watts (abs)	joules/sec	1
tons (short)	pounds (apoth or troy)	2,430.56	watt-hours	Btu	3.413
tons (short)	pounds (avdp)	2,000.0	watt-hours	ergs	3.60×10^{10}
tons (short)	slugs	62.16	watt-hours	ft-lb	2.656
tons (short)	tons (long)	0.89286	watt-hours	gm-cal	859.85
tons (short)	tons (metric)	0.9072	watt-hours	horsepower-hr	1.341×10^{-3}
tons (short)/sq ft	kg/sq meter	9.765	watt-hours	kg-cal	0.8605
tons (short)/sq ft	lb/sq in	2,000	watt-hours	kg-meters	367.2
tons of water/24 hr	lb of water/hr	83.333	watt-hours	kilowatt-hr	0.001
tons of water/24 hr	gal/min	0.16643	watt (int)	watt (abs)	1.0002
tons of water/24 hr	cu ft/hr	1.3349	webers	maxwells	10^8
torr	mm of mercury	1.0	webers	kilolines	10^5
torr	atmospheres	1.316×10^{-3}	webers/sq in	gauss	1.550×10^7
	V		webers/sq in	lines/sq in	10^8
volt/inch	volt/cm	0.39370	webers/sq in	webers/sq cm	0.1550
volt (abs)	statvolts	0.003336	webers/sq in	webers/sq meter	1,550
	W		webers/sq meter	gauss	10^4
watts	Btu/hr	3.4129	webers/sq meter	lines/sq in	6.452×10^4
watts	Btu/min	0.05688	webers/sq meter	webers/sq cm	10^{-4}
watts	ergs/sec	10^7	webers/sq meter	webers/sq in	6.452×10^{-4}
watts	ft-lb/min	44.27	webers/sq meter		
watts	ft-lb/sec	0.7378	yards	Y	
watts	horsepower	1.341×10^{-3}	yards	centimeters	91.44
watts	horsepower (metric)	1.360×10^{-3}	yards	feet	3.0
watts	kg-calories/min	0.01433	yards	inches	36.0
watts	kilowatts	0.001	yards	kilometers	9.144×10^{-4}
			yards	meters	0.9144
			yards	miles (naut)	4.934×10^{-4}
			yards	miles (stat)	5.682×10^{-4}
			yards	millimeters	914.4