CONVERSION FACTORS

HOW TO USE THIS TABLE: Find the unit you want to convert from listed in capital letters at the left-hand margin and multiply it by the number indicated to arrive at the unit listed to the right of the number. Where appropriate, additional information has been provided.

EXAMPLE:

	BritishThermalUnits	International Table	Btu	(energy)
		qualifying information	abbreviation	unit category
Conversion Factors	x 1.055 x10^{3}	= J*	unit converting to* indicates proper SI unit	
	x 2.928 x10^{-4}	= kW-h		
	x 3.928 x10^{-4}	= hp-h		
	x 0.252	= kcal		
	x 7.780 x10^{2}	= ft-lbf		

Additional information NOTE: There are several definitions of Btu, differing only past the third significant digit. If four or more significant digits are needed, refer to the appropriate handbook.

DERIVING UNITS: Many categories have several units related by a power of ten (e.g., Pa and kPa) or by a factor of 60 (e.g., fUs, fUmin, and ft/h). Generally, conversion factors are provided for only the proper Sl unit or the unit most easy to use. There are several shortcuts to deriving units not listed; following is one reliable method.

Suppose you have a volume per unit time of 1 cfh and you want to express that in m^3/s. Look up Cubic Feet Per Hour and read, "Divide by 60 and refer to Cubic Feet Per Minute." Look up Cubic Feet Per Minute and find the conversion factor to m^3/s(cfm x 4.7195 x 10^{-4} = m^3/s) . String these together and get
(1 cfh) x4.7195 x 10^{-4} /60= 0.000 007 865 833 or 7.8658 x 10^{-6} m^3/s.

Suppose you have a volume per unit time of 1 m^3/s and you want to express that in cfh. Look up Cubic Metres Per Second and find that the closest conversion factor for cfh is cfm (m^3/s x 2.1189 x 10^3 = cfm).Then look up Cubic Feet Per Minute and find the conversion factor to cfh (cfm x 60 = cfh). String these together and get
(1 m^3/s) x (2.1189 x 10^3) x 60 = 127134 or 1.2713 x 10^5.

SCIENTIFIC NOTATION: Remember when using a calculator that positive powers move the decimal point to the right of the 1 (e.g., 10^3 = 1 000.0) and negative powers move the decimal point to the left of the 1
(e.g.,10^{-3} = 0.0010).

PRESSURE UNITS: Where density is specified or implied, it is based on the following:
Density of water at 60°F = 62.3707 lb/ft^3
Density of mercury at 0°C = 13.5955 g/cm^3.

MAGNITUDE OF FIGURES: Where practical, conversion factors over 10^4or under 10^{-4} have not been included. (Factors have been included for all proper Sl units no matter what the

multiple.) However, avoid mixing prefixes within one document or equation (e.g., don't use kPa, Pa, and MPa together).

ACRES, U.S. Survey (area)

x 4.0469 x 10^{3} = m^{2}*
x 4.3560 x 10^{4} = ft^{2}
x 1.5625 x 10^{-3} = mj^{2}
x 0.4047 = ha

ATMOSPHERES, Standard at Sea Level Pressure -- atm (pressure)

x 1.0132 x 10^{5} = Pa*
x.14.696 = psia
x 7.60 x 10^{2} = mmHg at 0°C
x 29.921 = inHg at 0°C
x 4.0716 x 10^{2} = inH_2O at 60°F
x 33.930 = hH_2O at 60°F
x 1.0132 = bars absolute
x 1.0332 = kgf/cm^{2} absolute

NOTE: Where a qualifying temperature is noted, the values for this unit vary with temperature.

BARRELS, Petroleum -- bbl (volume)

x 0.1590= = m^{3}*
x 9.702 x 10^{3} = in^{3}
x 5.6146 = ft^{3}
x 42 = gal, U.S.
x 34.972 = gal, Imp.
x 1.5898 x 10^{2} = L

BARS (pressure)

x 10^{5} = Pa*
x 14.504 x = psi
7.5006 x 10^{2} = mmHg at 0°C
x 29.530 = inHg at 0°C
x 4.0184 x 10^{2} = inH_2O at 60°F
x 33.486 = ftH_2O at 60°F
x 0.9869 = atm
x 10^{3} = mbar
x 1.0197 = kgf/cm^{2}

NOTE: Where a qualifying temperature is noted, the values for this unit vary with temperature.

BRITISH THERMAL UNITS, International Table -- Btu (energy)

x 1.054 x 10^{3} = J*
x 2.929 x 10^{-4} = kW-h
x 3.928 x 10^{-4} = hp-h
x 0.252 = kcal
x 7.780 x 10^{2} = ft-lbf

NOTE: There are definitions of Btu other than the International Table, but they differ only past the third decimal place. If four or more decimal places are needed, refer to the appropriate handbook.

BTU PER HOUR, International Table -- Btu/h (power)

x 0.293 = W*
x 1.667 x 10^{-2} = Btu/min
x 3.93 x 10^{4} = hp
x 4.20 x 10^{-3} = kcal/min
x 12.961 = ft-lbf/min

NOTE: See note under Btu.

BTU PER MINUTE, International Table -- Btu/min (power) NOTE: Multiply by 60 and refer to Btu Per Hour.

CALORIES, International Table -- cal (energy) NOTE: Divide by 1000 and refer to Kilocalories.

CENTARES -- ca (area) NOTE: Refer to Square Metres.*

CENTIMETRES -- cm (length) NOTE: Divide by 100 and refer to Metres.*

CENTIMETRES OF MERCURY, at 0°C -- cmHg (pressure) NOTE: Multiply by 10 and refer to Millimetres of Mercury.

CENTIMETRES PER SECOND -- cm/s (velocity)
NOTE: Divide by 100 and refer to Metres Per Second.*

* Indicates proper SI unit

CENTIPOISES -- cP (absolute viscosity)

NOTE: Divide by 100 and refer to Poises.

CENTISTOKES -- cSt (kinematic viscosity)

NOTE: Divide by 100 and refer to Stokes.

CUBIC CENTIMETRES -- cm^{3} (volume)

x 10^{-6} = m^{3}*

x 6.1024 x 10^{-2} = in^3

x 3.5315 x 10^{-5} = ft^3

x 3.3814 x 10^{-2} = oz, U.S. fluid

x 3.5195 x 10^{-2} = oz, Imp. fluid

x 2.6417 x 10^{-4} = gal, U.S.

x 2.1997 x 10^{-4} = gal, Imp.

x 10^{-3} = pL

x 2.1134 x 10^{-3} = pt

x 1.0567 x 10^{-3} = pt

CUBIC CENTIMETRES PER SECOND -- cm^3/s (volume per unit time)

x 10^6 = m^3/s = m^3/s*

x 3.6614 = in^3/min

x 2.1189 x 10^{-3} = cfm

x 10^{-3} = L/s

x 1.5850 x 10^{-2} = U.S. gpm

x 2.2824 x 10^5 = million U.S. gpd

CUBIC FEET -- ft^3 (volume)

x 2.832 x 10^{-2} = m^3*

x 1.728 x 10^3 = in^3

x 9.5751 x = oz, U.S. fluid

x 9.9661 x = oz, Imp. fluid

x 7.4805 x = gal, U.S.

x 6.229 x = gal, Imp.

x 28.317 x = L

x 0.1781 x = bbl

CUBIC FEET PER HOUR -- cfh (volume per unit time)

NOTE: Divide by 60 and refer to Cubic Feet Per Minute.

CUBIC FEET PER MINUTE -- cfm (volume per unit time)

x 4.7195×10^{-4} = m^3/s*

x 1.6990 = m^3/h

x 1.728×10^{3} = in^3/min

x 1.667×10^{-2}= cfs

x 60 = cfh

x 0.4719 = L/s

x 7.4805 = U. S. gpm

x 1.0772×10^{-2}= million U.S. gpd

CUBIC FEET PER SECOND -- cfs (volume per unit time)

NOTE: Multiply by 60 and refer to Cubic Feet Per Minute.

CUBIC INCHES -- in^3 (volume)

x 1.6387×10^{-5} = m^3*

x 5.787×10^{-4} = ft^3

x 0.5541 = oz, U.S. fluid

x 0.5767 = oz, Imp. fluid

x 4.329×10^{-3} = gal, U.S.

x 3.605×10^{-3} = gal, Imp.

x 1.639×10^{-2}= L

CUBIC INCHES PER MINUTE -- in^3/min (volume per unit time)

x 2.7312×10^{-7} = m^3/s*

x $5.787 \times 1\ 0^{-4}$ = cfm

x 2.7312×10^{-4} = L/s

x 4.3290×10^{-3} = U.S. gpm

* **CUBIC METRES -- m^3 (volume)**

x 6.1024 x 1 0^4= R^3x

35.315= ft^3

x 3.3814 x 10^4 = oz, U.S. fluid

x 3.5195 x 10^4 = oz, Imp. fluid

x 2.6417 x 10^2 = gal, U.S.

x 2.1997 x 10^2 = gal, Imp.

x 10^3 = L

x 6.2898 = bbl

CUBIC METRES PER HOURS -- m^3/h (volume per unit time)

NOTE: Divide by 3600 and refer to Cubic Metres Per Second.*

CUBIC METRES PER MINUTE -- m^3/min (volume per unit time)

NOTE: Divide by 60 and refer to Cubic Metres Per Second.*

* Indicates proper SI unit

*** CUBIC METRES PER SECOND -- m^3/s (volume per unit time)**

x 60 = m^3/min

x 3.600 x 10^3 = m^3/h

x 10^6 = cm^3/S

x 2.1189 x 10^3 = dm

x 10^3 = L/s

x 15.850 x 10^3 = U.S. gpm

x 22.824 = million U.S. gpd

DEGREES, Angular -- ° (plane angles)

x 1.745 x 10^{-2} = rad

x 60 = ', angular

x 3.600 x 10^3 = ", angular

*** DEGREES CELSIUS -- °C (temperature)**

(C x 9/5) + 32 = °F

C+273.15 = K

(C x 9/5) + 491.67 = °R

DEGREES CENTIGRADE--see Degrees Celsius (temperature)

DEGREES FAHRENHEIT -- °F (temperature)

(F - 32)/1.8 = °C*

(F + 459.67)/1.8 = K

F + 459.67 = °R

DEGREES KELVIN -- see Kelvin (temperature)

DEGREES RANKINE -- °R (temperature)

(R/1.8) - 273.15 = °C*

R - 459.69 = °F

R/1.8 = K

DEGREES PER SECOND, Angular -- °/s (angular velocity)

x 1.7453 x 10^{-2} = rad/s*

x 0.1667 = r/min (rpm)

DYNES (force)

x 10^{-5} = N*

x 1.0197 x 10^{-6} = kgf

x 2.2481 x 10^{-6} = lbf

FEET -- ft (length)

x 0.3048 = m*

x 12 = in

x 0.3333 = yd

x 1.894 x 10^{-4} = mi, statute

x 1.6458 x 10^{-4} = mi, nautical

FEET OF WATER, at 68°F -- ftH_20 (pressure)

x 2.9863 x 10^{3} = Pa*

x 0.4331 = Psi

x 22.399 = mmHgatO°C

x 0.8818 = inHg at 0°C

x 12 = in H_2O at 60°F

x 2.9473 x 10^{-2} = atm

x 2.9863 x 10^{-2} = bar

x 3.0452 x 10^{-2} = kgf/cm^2

NOTE: Where a qualifying temperature is noted, the values for this unit vary with temperature.

FEET PER MINUTE -- ft/min (velocity)

x 5.0800 x 10^{-3}= m/s*

x 1.8288 x 10^{-2}= km/h

x 1.1364 x 10^{-2}= mph

x 1.6667 x 10^{-2}= ft/s

x 9.8750 x 10^{-3} = kn

FEET PER SECOND -- ft/s (velocity)

NOTE: Multiply by 60 and refer to Feet Per Minute.

FEET PER SECOND SQUARED -- ft/s^2 (acceleration)

x 0.3048 = m/s^2*

FEET-POUNDS-FORCE -- ft-lbf (energy)

x 1.3558 = J*

x 3.7662 x 10^{-7} = kW-h

x 1.285 x 10^{-3} = Btu

x 5.0505 x 10^{-7} =hp-h

x 3.238 x 10^{-4} = kcal

FOOT-POUNDS-FORCE PER HOUR -- ft-lbf/h (power)

NOTE: Divide by 60 and refer to Foot-Pounds-Force Per Minute.

FOOT-POUNDS-FORCE PER MINUTE -- ft-lbf/min (power)

x 2.2597 x 10^{-2} = W*

x 7.716 x 10^{-2} = Btu/h

x 3.030 x 10^{5} = hp

x 3.2405 x 10^{4} = kcal/min

x 60 = ft-lbf/h

x 1.667 x 10^{-2} = ft-lbf/s

FOOT-POUNDS-FORCE PER SECOND -- ft-lbf/s (power)

NOTE: Multiply by 60 and refer to Foot-Pounds-Force Per Minute.

FURLONGS

x 0.125 = miles

x 40 = rods

x 660 = feet

GALLONS, Imperial -- gal (volume)

x 4.546 x 10^{-3} = m^3*

x 2.774 x 10^{2}= in^3

x 0.1605 = ft^3

x 1.537 x 10^{2} = oz, U.S. fluid

x 160 = oz, Imp. fluid

x 1.2009 = gal, U.S.

x 4.546 = L

x 2.859 x 10^{-2} = bbl

GALLONS, U.S. -- gal (volume)

x 3.7854 x 10^{-3}= m^3*

x 2.31 x 10^{2}= in^3

x 0.1337= ft^3

x 128 = oz, U.S. fluid

x 1.3323 x 10^{2} = oz, Imp. fluid

x 0.8327 = gal, Imp.

x 3.7854 = L

x 8 = pt

x 4 = qt

x 2.3810 x 10^{-2}= bbl

GALLONS PER HOUR, U.S. -- U.S. gph (volume per unit time)

NOTE: Divide by 60 and refer to Gallons Per Minute, U.S.

GALLONS PER MINUTE, U.S. -- U.S. gpm (volume per unit time)

x 6.3090 x 10^{-5}= m^3/s*

x 2.31 x 10^{2} = in^3/min

x 01337 = cfm

x 60 = U.S. gph

x 1.667 x 10^{-2}= U.S. gps

x 6.309 x 10^{-2}= L/s

x 1.4400 x 10^{-3}= million U.S. gpd

GALLONS PER SECOND, U.S. -- U. S. gps (volume per unit time)

NOTE: Multiply by 60 and refer to Gallons Per Minute, U.S.

GRAINS, Avoirdupois or Troy -- gr (mass)

x 6.480 x 10^{-5}= kg*

x 6.480 x 10^{-2} = g

x 2.2857 x 10^{-3} = oz, av.

x 2.0833 x 10^{-3} = oz, troy

x 1.4286 x 10^{-4} = lb, av.

x 1.7361 x 10^{-4} = lb, troy

x 4.1667 x 10^{-2} = dwt

GRAMS--g (mass)

x 10^{-3} = kg*

x 3.5274 x 10^{-2} = oz, av.

x 3.2151 x 10^{-2} = oz, troy

x 2 2046 x 10^{-3} = lb, av.

x 2.6792 x 10^{-3} = lb, troy

x 15.432 = gr

x 0.6430 = dwt

GRAMS PER CUBIC CENTIMETRE -- g/cm^3 (mass per unit volume)

NOTE: Divide by 1000 and refer to Kilograms Per Cubic Metre.*

GRAMS PER CUBIC METRE -- g/m^3 (mass per unit volume)

NOTE: Divide by 1000 and refer to Kilograms Per Cubic Metre.*

GRAMS PER LITRE (g/L) -- see Kiloqrams Per Cubic Metre* (mass per unit volume)

HECTARES -- ha (area)

x 10^4 = m^2*

x 3.861 x 10^{-3} = mj^2

x 2.4711 = acre

HORSEPOWER, Boiler -- boiler hp (power)

x 9.8095 x 10^3 = W*

x 3.3446 x 10^4 = Btu/h

x 13.1548 = hp (mechanical)

x 1.407 x 10^2 = kcal/min

x 4.3411 x 10^5 = ft-lbf/min

HORSEPOWER, Mechanical -- hp (power)

x 7.457 x 10^2 = W*

x 2.543 x 10^3 = Btu/h

x 10.694 = kcal/min

x 3.30 x 10^4 = ft-lbf/min

x 1.0139 = metric hp

x 7.6018 x 10^{-2} = boiler hp

NOTE: In most conversions, this is the type of horsepower assumed unless otherwise stated.

HORSEPOWER, Metric -- metric hp (power)

x 7.3550 x 10^2 = W*

x 2.51 x 10^3 = Btu/h

x 0.9863 = hp (mechanical)

x 10.55 = kcal/min

HORSEPOWER-HOURS -- hp-h (energy)

x 2.6845 x 10^6 = J*

x 0.7457 = kW-h

x 2.546 x 10^3 = Btu

x 6.416 x 10^2 = kcal

x 1.98 x 10^6 = ft-lbf

INCHES -- in (length)

x 2.54 x 10^{-2} = m*

x 8.3333 x 10^{-2} = ft

x 2.7778 x 10^{-2} = yd

x 1.5783 x 10^{-5} = mi, statute

INCHES OF MERCURY, at 0°C -- inHg (pressure)

x 3.3864 x 10^{3} = Pa*

x 04912 = psi

x 25.4 = mmHg at 0°C

x 13.608 = in H_2O at 60°F

x 1.1340 = ftH_2O at 60°F

x 3 3421 x 10^{-2}= atm

x 3 3864 x 10^{-2}= bar

x 3.4532 x 10^{-2}= kgf/cm^2

NOTE: Where a qualifying temperature is noted, the values for this unit vary with temperature.

INCHES OF WATER, at 68°F -- in$H_2$0 (pressure)

x 2.4886 x 10^{2} = Pa*

x 3.6094 x 10^{-2} = psi

x 1.8666 = mmHg at 0°C

x 7.3486 x 10^{-2} = inHg at 0°C

x 8.333 x 10^{-2} = ft$H_2$0 at 60°F

x 2.4560 x 10^{-3} = atm

x 2.4886 x 10^{-3}= bar

x 2.5377 x 10^{-3}= kgf/cm^2

NOTE: Where a qualifying temperature is noted, the values for this unit vary with temperature.

*** JOULES -- J (energy)**

x 2.778 x 10^{-7} = kW-h

x 9.485 x 10^{-4} = Btu

x 3.725 x 10^{-7} = hp-h

x 2.390 x 10^{-4} = kcal

x 0.7376 = ft-lbf

KELVIN -- K (temperature)

K -- 273.15 = °C*

1.8K -- 459.67 = °F

1.8K = °R

KILOCALORIES, International Table -- kcal (energy)

x 4.184 x 10^{3} = J*

x 1.1622 x 10^{-3} = JkW-h

x 3.9683 = Btu

x 1.5586 x 10^{-3} = hp-h

x 3.0860 x 10^{3} = ft-lbf

x 10^{3} = cal

KILOCALORIES PER MINUTE, International Table -- kcal/min (power)

x 69.733 = W*

x 2.3810 x 10^{2} = Btu/h

x 9.3514 x 10^{-2} = hp

x 3.0860 x 10^{3} = ft-lbf/min

* Indicates proper SI unit

* **KILOGRAMS -- kg (mass)**

x 10^{3} = g

x 35.274 = oz. av.

x 32.151 = oz. troy

x 2.2046 = Ib,av.

x 2.6792 = lb, troy

x 1.5432 x 10^{4} = gr

x 6.4301 x 10^{2} = dwt

x 9.8420 x 10^{-4}= long ton

x 1.1023 x 10^{-3}= short ton

x 10^{-3}= t

*** KILOGRAMS PER CUBIC METRE -- kg/m³ (mass per unit volume)**

x 10^{3}= g/m^{3}

x 10^{-3}= g/cm^{3}

x 3.6127 x 10^{-5}= Ib/in^{3}

x 8.3454 x 10^{3} = Ib/U.S. gal

x 1.0022 x 10^{-2} = Ib/Imp. gal

x 9.9908 x 10^{3} = ppminH_2O at 60°F

KILOGRAMS PER HOUR -- kg/h(mass per unit time)

NOTE: Divide by 3600 and refer to Kilograms Per Second.*

KILOGRAMS PER MINUTE -- kg/min (mass per unit time)

NOTE: Divide by 60 and refer to Kilograms Per Second.*

*** KILOGRAMS PER SECOND -- kg/s (mass per unit time)**

x 1.3228 x 10^{2} = Ib/min

x 60 = kg/min

x 3.600 x 10^{3} = kg/h

KILOGRAMS-FORCE -- kgf (force)

x 9.8067 = N*

x 2.2046 = lbf

x 9.8067 x 10^5 = dynes

KILOGRAMS-FORCE PER SQUARE CENTIMETRE -- kgf/cm² (pressure)

x 9.8067 x 10^4 = Pa*

x 14.223 = psi

x 7.3556 x 10^2 = mmHg at 0°C

x 28.959 = inHg at 0°C

x 3.9406 x 10^2 = inH_2O at 60°F

x 32.838 = ftH_2O at 60°F

x 0.9678 = atm

x 0.9807 = bar

NOTE: Where a qualifying temperature is noted, the values for this unit vary with temperature.

KILOGRAMS-FORCE TIMES METRES -- kgf x m (torque)

x 9.8067 = N-m*

x 7.2330 = lbf x ft

KILOMETRES -- km (length)

NOTE: Multiply by 1000 and refer to Metres.*

KILOMETRES PER HOUR -- km/h (velocity)

x 0.2778 = m/s*

x 0.6214 = mph

x 54.681 = ft/min

x 0.5400 = kn

KILOPASCALS -- kPa (pressure)

NOTE: Multiply by 1000 and refer to Pascals.*

KILOPONDS -- see Kilograms-force (force)

KILOWATTS -- kW (power)

NOTE: Multiply by 1000 and refer to Watts.*

KILOWATT-HOURS -- kW-h (energy)

x 3.600 x 10^{6} = J*

x 10^{3} = W-h

x 3.4095 x 10^{3} = Btu

x 1.3410 = hp-h

x 8.5918 x 10^{2} = kcal

x 2.6552 x 10^{6} = ft-lbf

KNOTS, International -- kn (velocity)

x 0.5144 = m/s*

x 1.852 = km/h

x 1.1508 = mph

x1.0127 x 10^{2} = ft/min

* Indicates proper SI unit

LITRES -- L (volume)

x 10^{-3}= m^{3}*

x 61.024 = in^{3}

x 3.5315 x 10^{-2}= ft^{3}

x 33.814 = oz, U.S. fluid

x 35.195 = oz, Imp. fluid

x 0.2642 = gal, U.S.

x 0.2200 = gal, Imp.

x 6.2898 x 10^{-3}= bbl

LITRES PER SECOND -- L/s (volume per unit time)

x 10^{-3} = m^{3}/s*

x 3.6614 x 10^{3} = in^{3}/min

x 2.1189 = cfm

x 15.850 = U.S. gpm

x 2.2824 x 10^{-2} = million U.S. gpd

MEGAPASCALS -- MPa (pressure)

NOTE: Multiply by 1000000 and refer to Pascals.*

MEGAWATTS -- MW (power)

NOTE: Multiply by 1000000 and refer to Watts.*

*** METRES--m (length)**

x 10^{6} = µm

x 10^{3} = mm

x 10^{2} = cm

x 10^{-3} = km

x 39.370 = in

x 3.2808 = ft

x 1.0936 = yd

x 6.2137 x 10^{-4} = mi, statute

x 5.3996 x 10^{-4} = mi, nautical

METRES PER MINUTE--m/min (velocity)

NOTE: Divide by 60 and refer to Metres Per Second.*

* **METRES PER SECOND -- m/s (velocity)**

x 60 = m/min

x 10^{2} = cm/s

x 3.6 = km/h

x 2.2369 = mph

x 1.9685 x 10^{2} = ft/min

x 1.9438 = kn

*** METRES PER SECOND SQUARED -- m/s^{2} (acceleration)**

x 3.281 = ft/s^{2}

METRIC TONS -- see Tonnes (mass)

MICROMETRES -- µm (length)

x 1.000 x 10^{-6} = m*

MICRONS -- see Micrometres (length)

MILES, Statute -- mi (length)

x 1.6093 x 10^{3} = m*

x 6.3360 x 10^{4} = in

x 5.280 x 10^{3} = ft

x 1.760 x 10^{3} = yd

x 0.8690 = mi, nautical

MILES, International Nautical -- mi (length)

x 1.852 x 10^{3} = m*

x 7.2913 x 10^{4} = in

x 6.0761 x 10^{3} = ft

x 2.0254 x 10^{3} = yd

x 1.1508 = mi, statute

MILES PER HOUR, Statute -- mph (velocity)

x 0.4470 = m/s*

x 1.6093 = km/h

x 88 = ft/min

x 0.8690 = kn

MILLIBARS -- mbar (pressure)

x 10^{-3} = bars

MILLILITRES--see Cubic Centimetres (volume)

MILLIMETRES--mm (length)

NOTE: Divide by 1000 and refer to Metres.*

MILLIMETRES OF MERCURY, at O°C -- mmHg (pressure)

x 1.3332 x 10^{2} = Pa*

x 1.9337 x 10^{-2}= psi

x 0.10 = cmHg at O°C

x 3.9370 x 10^{-2} = inHg at O°C

x 0.5357 = inH_2O at 60°F

x 4.4644 x 10^{-2}= ftH_2O at 60°F

x 1.3158 x 10^{-3} = atm

x 1.3332 x 10^{-3} = bar

x 1,3595 x 10^{-3} = kgf/cm^2

NOTE: Where a qualifying temperature is noted, the values for this unit vary with temperature.

MILLION GALLONS PER DAY, U.S. -- million U.S. gpd (volume per unit time)

x 4.3813 x 10^{-2} = m^3/s*

x 1.6042 x 10^{5} = in^3/min

x 92.834 = cfm

x 43.813 = L/s

x 6.9444 x 10^{2} = U.S. gpm

MINUTES, Angular -- ' (plane angles)

x 2.9089 x 10^{-4} = rad*

x 1.667 x 10^{-2} = °, angular

x 60 = '', angular

NEWTONS -- N (force)

x 0.1020 = kgf

x 0.2248 = lbf

x 10^5 = dynes

*** NEWTON-METRES -- N-m (torque)**

x 0.1020 = kgf x m

x 0.7376 = lbf x ft

OUNCES, Avoirdupois -- av. oz (mass)

x 2.8350 x 10^{-2} = kg*

x 28.350 = g

x 0.9115 = oz, troy

x 0.0625 = lb, av.

x 7.595 x 10^{-2} = lb, troy

x 4.375 x 10^2 = gr

x 18.229 = dwt

OUNCES, Fluid, Imperial -- oz (volume)

x 2.8412 x 10^{-5} = m^3*

x 1.7339 = in^3

x 1.0034 x 10^{-3}= ft^3

x 0.9608 = oz, U.S. fluid

x 7.5060 x 10^{-3}= gal, U.S.

x 6.25 x 10^{-3}= gal, Imp.

x 2.8412 x 10^{-2}= L

OUNCES, Fluid, U.S. -- oz (volume)

x 2.9574 x 10^{-5} = m^3*

x 1.8047 = in^3

x 1.0444 x 10^{-3} = ft^3

x 1.0408 = oz, Imp. fluid

x 7.8125 x 10^{-3} = gal, U.S.

x 6.5053 x 10^{-3} = gal, Imp.

x 2.9573 x 10^{-2} = L

OUNCES, Troy -- troy oz (mass)

x 3.1103 x 10^{-2} = kg*

x 31.10^3 = g

x 1.0971 = oz, av.

x 8.3333 x 10^{-2} = lb, troy

x 6.857 x 10^{-2} = lb, av.

x 4.80 x 10^{-2} = gr

x 20 = dwt

PARTS PER MILLION, by weight (mass) in water at 60°F -- ppm or ppm in H_2O at 60°F (mass per unit volume)

x 9.9908 x 10^{-4} = kg/m^3*

x 3.6094 x 10^{-8} = lb/in^3

x 8.3377 x 10^{-6} = lb/U.S. gal

x 1.0013 x 10^{-5} = lb/Imp. gal

*** PASCALS -- Pa (pressure)**

x 10^{-3} = kPa

x 10^{-6} = MPa

x 1.4504 x 10^{-4} = psi

x 7.5006 x 10^{-3} = mmHg at 0°C

x 2.9530 x 10^{-4} = inHg at 0°C

x 4.0186 x 10^{-3} = inH_2O at 60°F

x 3.3488 x 10^{-4} = ftH_2O at 60°F

x 9.8692 x 10^{-6} = atm

x 10^{-5} = bar

x 1.0197 x 10^{-5} = kgf/cm^2

x 10 = dynes/cm^2

NOTE: Where a qualifying temperature is noted, the values for this unit vary with temperature.

PENNYWEIGHTS -- dwt (mass)

x 1.5552 x 10^{-3} = kg*

x 1.5552 = g

x 5.4857 x 10^{-2} = oz, av.

x 5.00 x 10^{-2} = oz, troy

x 3.4286 x 10^{-3} = lb, av.

x 4.167 x 10^{-3} = lb, troy

x 24 = gr

PINTS, Fluid -- pt (volume)

x 4.7316 x 10^{-4} = m^3*

x 28.875 = in^3

x 1.671 x 10^{-2} = ft^3

x 16 = oz, U.S. fluid

x 16.653 = oz, Imp. fluid

x 0.125 = gal, U.S.

x 0.1041 = gal, Imp.

x 0.4732 = L

x 0.5 = qt

POISES -- P (absolute viscosity)

x 0.1000 = Pa-s*

x 100 = cP

x 2.0885 x 10^{-3} = lbf-s/ft^2

x 0.0672 = lb/ft-s

POUNDS, Avoirdupois -- lb (mass)

x 0.4536 = kg*

x 4.5359 x 10^{2} = g

x 16 = oz, av.

x 14.583 = oz, troy

x 1.2153 = lb, troy

x 7.00 x 10^{3} = gr

x 2.9167 x 10^{2} = dwt

x 5.00 x 10^{-4} = short ton

x 4.464 x 10^{-4} = long ton

x 4.536 x 10^{-4} = t

POUNDS,Troy--Ib (mass)

x 0.3732 = kg*

x 3.732 x 10^{2} = g

x 12 = oz, av.

x 13.166 = oz, troy

x 0.8229 = Ib, troy

x 5.760 x 10^{3} = gr

x 2.40 x 10^{2} = dwt

x 4.1143 x 10^{-4} = short ton

x 3.6735 x 10^{-4} = long ton

x 3.7324 x 10^{-4} = t

POUNDS PER CUBIC FOOT -- lb/ft³ (mass per unit volume)

x 16.018 = kg/m³*

x 5.787 x 10^{-4} = lb/in³

x 0.1337 = lb/U.S. gal

x 0.1605 = lb/Imp. gal

x 1.6033 x 10^{-4} = ppm inH_2O at 60°F

POUNDS PER CUBIC INCH--lb/in³(mass per unit volume)

x 2.7680 x 10^{4} = kg/m³*

x 1.728 x 10^{3} = lb/ft³

x 2.31 x 10^{2} = lb/U.S. gal

x 2.774 x 10^{2} = lb/Imp. gal

x 2.7705 x 10^{7} = ppm inH_2O at 60°F

* Indicates proper SI unit

POUNDS PER HOUR -- lb/h (mass per unit time)

NOTE: Divide by 60 and refer to Pounds Per Minute.

POUNDS PER IMPERIAL GALLON -- lb/gal (mass per unit volume)

x 99.776 = kg/m³*

x 3.6047 x 10^{-3} = lb/in³

x 0.8327 = lb/U.S. gal

x 9.9868 x 10^{4} = ppm inH_2O at 60°F

POUNDS PER MINUTE -- lb/min (mass per unit time)

x 7.5599 x 10^{-3} = kg/s*

x 1.667 x 10^{-2} = lb/s

x 60 = lb/h

POUNDS PER SECOND -- lb/s (mass per unit time)

NOTE: Multiply by 60 and refer to Pounds Per Minute.

POUNDS PER U.S. GALLON -- lb/gal (mass per unit volume)

x 1.1983 x 10^{2} = kg/m^{3}*

x 4.3290 x 10^{-3} = lb/in^{3}

x 1.2010 = lb/Imp. gal

x 1.1994 x 10^{5} = ppm inH_2O at 60°F

POUNDS-FORCE -- lbf (force)

x 4.4482 = N*

x 0.4536 = kgf

x 4.4482 x 10^{5} = dynes

POUNDS-FORCE TIMES FEET -- lbf x ft (torque)

x 1.3558 = N-m*

x 0.1383 = kgf x m

POUNDS-FORCE PER SQUARE INCH -- psi (pressure)

x 6.895 x 10^{3} = Pa*

x 51.715 = mmHg at 0°C

x 2.036 = inHg at 0°C

x 27.705 = inH_2O at 60°F

x 2.3088 = ftH_2O at 60°F

x 6.8046 x 10^{-2} = atm

x 6.895 x 10^{-2} = bar

x 7.031 x 10^{-2} = kgf/cm^{2}

NOTE: Where a qualifying temperature is noted, the values for this unit vary with temperature.

QUARTS, Fluid -- qt (volume)

x 9.4635 x 10^{-4} = m^3*

x 57.75= in^3

x 3.342 x 10^{-2}= ft^3

x 32 = oz, U.S. fluid

x 33.31 = oz, Imp. fluid

x 0.25 = gal, U.S.

x 0.2082 = gal, Imp.

x 0.9464 = L

*** RADIANS -- rad (plane angles)**

x 57.296 = °, angular

x 3.4377 x 10^3 = ', angular

x 2.0626 x 10^5 = '', angular

*** RADIANS PER SECOND -- rad/s (angular velocity)**

x 57.296 = °/s

x 9.5493 = r/min (rpm)

REVOLUTIONS PER MINUTE -- r/min (angular velocity)

x 0.1047 = rad/s*

x 6 = °/s

x 1.667 x 10^{-2} = r/s

NOTE: A common variation of the short form of this category is rpm.

REVOLUTIONS PER SECOND -- r/s (angular velocity)

NOTE: Multiply by 60 and refer to Revolutions Per Minute.

SECONDS, Angular -- '' (plane angles)

x 4.8481 x 10^{-6} = rad*

x 2.778 x 10^{-4} = °, angular

x 1.667 x 10^{-2} = ', angular

SQUARE CENTIMETRES -- cm^2 (area)

NOTE: Divide by 10000 and refer to Square Metres.*

* Indicates proper SI unit

SQUARE FEET -- ft^2 (area)

x 9.2903 x 10^{-2} = m^2*

x 1.44 x 10^2 = in^2

x 3.5870 x 10^{-8} = mi^2

x 2.2957 x 10^{-5} = acre

x 9.29 x 10^{-6} = ha

SQUARE INCHES -- in^2 (area)

x 6.4516 x 10^{-4} = m^2*

x 6.944 x 10^{-3} = ft^2

* **SQUARE METRES -- m^2 (area)**

x 10^4 = cm^2

x 1.550 x 10^3 = in^2

x 10.764 = ft^2

x 2.4711 x 10^{-4} = acre

x 10^{-4} = ha

x 1 = ca

SQUARE MILES -- mi^2 (area)

x 2.5900 x 10^6 = m^2*

x 6.40 x 10^2 = acre

x 2.5900 x 10^2 = ha

STOKES -- St (kinematic viscosity)

x 10^{-4} = m^2/s*

x 1.076 x 10^{-3} = ft^2/s

x 10^2 = cSt

TONNES -- t (mass)

x 10^3 = kg*

x 2.2046 x 10^3 = lb, av.

x 2.679 x 10^3 = lb, troy

x 0.9842 = long ton

x 1.1023 = short ton

TONS -- long ton (mass)

x 1.016 x 10^3 = kg*

x 2.240 x 10^3 = lb, av.

x 2.722 x 10^3 = lb, troy

x 1.120 = short ton

x 1.016 = t

TONS -- ton or short ton (mass)

x 9.072 x 10^2 = kg*

x 2 x 10^3 = Ib,av.

x 2.4306 x 10^3 = lb, troy

x 0.8929 = long ton

x 0.9072 = t

TORR--see Millimetres of Mercury (pressure)

*** WATTS -- W (power)**

x 10^{-3} = kW

x 10^{-6} = MW

x 3.414 = Btu/h

x 1.3410 x 10^{-3} = hp

x 1.432 x 10^{-2} = kcal/min

x 44.2357 = ft-lbf/min

WATT-HOURS -- W-h (energy)

NOTE: Divide by 1000 and refer to Kilowatt-hours.

YARDS -- yd (length)

x 0.9144 = m*

x 36 = in

x 3 = ft

x 5.682 x 10^{-4} = mi, statute

x 4.937 x 10^{-4} = mi, nautical

Contact

MTI Analytical Technology

P.O. Box 571866

Houston, TX 77257-1866 USA

Tel: +1 (713) 978-7765 Fax: +1 (713) 978-6230

www.mertechinc.com