

CONVERSIONS & FORMULAS

Lengths:

1 inch = 2.54 centimeters
1 foot = 12 inches = 30.48 centimeters
1 yd. = 3 ft. = 36 inches
1 meter = 39.37 in. = 3.28 ft. = 1.094 yds
1 mile = 1,760 yd. = 5,280 ft.
1 kilometer = 0.62 miles

Area:

1 square ft. = 144 square inches
1 square yd. = 9 square ft.

Volume and Capacity:

1 cubic ft. = 7.48 gallons
1 cubic yd. = 27 cubic ft.
1 quart = 2 pints = 32 fluid ounces
1 liter = 1000 milliliters = 1.06 quarts = 1000 cubic centimeters
1 gallon (gal) = 8 pints = 231 cubic inches = **3.785 liters** = 3,785 milliliters
1 acre foot (ac. ft.) = 43,560 cubic feet = 325,851 gallons

Weight:

1 pound = 16 ounces = 7000 grains = 453.6 grams = .454 kilograms
1 kilogram = 1,000 gm = 2.205 pounds
1 ton = 2,000 pounds
1 gallon of water = 8.34 pounds
1 cubic ft. of water = 62.4 pounds
1 liter of water = 1 kilogram = 1000 grams
1 milliliter of water = 1 gram
Density of water = 1gm/ml or (1gm/cc) or 8.34 lbs/gal, or 62.4 lb./cu.ft.
Specific gravity of water = 1.00

Time:

1 minute = 60 seconds
1 hour = 60 minutes = 3600 seconds
1 day = 24 hours = 1,440 minutes = 86,400 seconds
1 week = 7 days
1 yr. = 12 months = 52 weeks = 365 days

Hydraulics:

2.31 Head Feet = 1 PSI
0.433 PSI = 1.0 Feet of Head

Flows:

1 gallons per minute = 1,440 gallons/day
1 cubic foot per second = 646,272 gallons/day = 448.8 gallons per minute
1 million gallons per day = 1.55 cubic ft./sec. = 694.4 gallons per minute

Temperature:

Degree Fahrenheit = (9/5 x Degree C) + 32 or +40 x 9/5 - 40
Degree Centigrade = (Degree F - 32) x 5/9 or +40 x 5/9 - 40

Concentration:

1 part per million = 1 milligram per liter = 0.0584 grains per gallon = 8.34 Pounds per MG
1 pound of weight per million pounds

Per Capita Water Use =

Water used (gal/day)/total number of people

Horsepower:

1 horsepower = 550 foot-pounds/second = 33,000 foot-pounds/minute = 1,980,000 foot-pounds/hour

Water Horsepower =

$$Q \text{ (flow gal/min.)} \times H \text{ (Head in ft.)} \\ 3960$$

Brake Horsepower = $\frac{\text{Water Horsepower}}{\text{Efficiency of Pump}}$

Motor Horsepower = $\frac{\text{Brake Horsepower}}{\text{Motor Efficiency}}$

Power (Electrical):

Kilowatts (kW) = 0.746 x Motor Horsepower

Efficiency:

% Efficiency = $\frac{\text{out power}}{\text{input power}}$

Wire to Water Efficiency:

Overall Efficiency = $\frac{\text{Water Horsepower}}{\text{Electrical Horsepower}} \times 100$

CT = Chlorine Concentration (mg/L) x Time (min)

Percent =

$\frac{\text{Part}}{\text{Whole}} \times 100$

Flow Rate =

Q (flow ft³/sec.) = V (velocity ft/sec.) x A (area ft²)

Force =

Pressure (psi) x Area (inches²)

Square or Rectangle Area =

Length x Width

Circular Area = .785 x Diameter² or
3.14 X Radius² (pi x R²) (pi = 3.14)

Circumference:

3.14 X Diameter (pi x Diameter)

Circular Volume:

Area x Height or Length

Chemical Dosage:

All these formulas require to be divided by % of strength.

Flow—Chemical by weight:

lbs/day = MGD x 8.34 x PPM, or

lbs/day = gal/min x .012 x PPM

Flow—Chemical by volume:

Gallons/day = MGD or g/m x PPM

Volume:

Pounds = MG x 8.34 x PPM, or

Gallons = MG x PPM, or

Detention time = $\frac{\text{Tank Volume (gallons)}}{\text{Flow (gpm or gpd or gph)}}$

Filtration Rate (gpm/ft²) = $\frac{\text{Flow (gal/min)}}{\text{Surface Area (ft²)}}$

Surface Overflow Rate =

$\frac{\text{Flow (gallons/day)}}{\text{Tank Surface Area (ft²)}}$

Specific Capacity =

$\frac{\text{Flow (gallons per minute)}}{\text{Well Drawdown (feet)}}$

Percent Strength by Weight =

$\frac{\text{Weight of Solute}}{\text{Weight of Solution}} \times 100$

Weight of Solution = Weight of Solute +

Weight of Solvent

Dilutions =

$V_1 \times C_1 = V_2 \times C_2$

$V_1 \times C_1 + V_2 \times C_2 = V_t \times C_t$

(t equals totals of 1 & or 2)

Specific Gravity =

$\frac{\text{Solution weight (lbs/gal)}}{\text{Weight of Water (8.34 lbs/gal)}}$

Meter Accuracy=

$\frac{\text{Gal/min of meter}}{\text{Volume in Gal/min}} \times 100$