FORMULA & CONVERSION SHEET for DRINKING WATER TREATMENT & DISTRIBUTION

CONVERSTIONS

1 psi	=	2.31 ft. of head
1 ft. of head	=	.433 psi
1 cuft of water	=	7.48 gallons
1 cuft of water	=	62.4 lbs.
1 gallon	=	8.34 lbs.
1 gallon	=	3,785 ml
1 Liter	=	1,000 ml
1 Liter	=	1,000 grams
1 mg/L	=	8.34 lbs/MG
1 ppm	=	1 mg/L
1 ml	=	1 gram
1 pound	=	453.6 grams
1 pound	=	7,000 grains
1 kilogram	=	1,000 grams
1 cuft/sec	=	448.8 gpm
1 MGD	=	1.55 cuft/sec
1 MGD	=	694.5 gpm
1 HP	=	33,000 ft.lbs./min
1 HP	=	.746 kilowatt
1 mile	=	5,280 feet

FLOW AND VELOCITY

"Q" = FLOW expressed in cubic ft per sec. (cfs)

"V" = VELOCITY expressed in ft per second (fps)

"A" = AREA expressed in square feet (sqft)

$Q = A \times V$

$V = Q \div A$

$A = Q \div V$

WATER-BRAKE-MOTOR HORSEPOWER

$$WHP = \frac{GPM \times Total\ Head\ (ft)}{3960}$$

$$BHP = \frac{GPM \times Total\ Head\ (ft)}{3960 \times E_p}$$

$$MHP = \frac{GPM \times Total\ Head\ (ft)}{3960 \times E_p \times E_m}$$

E_p = Pump Efficiency (%)

E_m = Motor Efficiency (%)

CONVERSION OF TEMPERATURES

$$^oF = (^oC \times 1.8) + 32$$

$$^oC = \frac{(^oF - 32)}{1.8}$$

Check your work: water freezes at 32°F and 0°C
water boils at 212°F and 100°C

OBJECT	AREA (ft^2)	VOLUME (ft^3)
Rectangle	Length' x Width'	Length' x Width' x Height'
Circle	.785 x D' x D'	
Triangle	1/2 (Base' x Altitude')	
Cylinder		.785 x D' x D' x Length'
Sphere		.5236 x D' x D' x D'

Diameter (D) = 2 x radius

Circumference = 3.14 x D

Perimeter = Sum of the Sides

FILTRATION RATE = Flow (gpm) ÷ Surface Area (sqft)
BACKWASH RATE = Flow (gpm) ÷ Surface Area (sqft)
SURFACE OVERFLOW RATE = Flow (gpm) ÷ Area (sqft)
DETENTION TIME = Volume (gals) ÷ Flow (gpm)
WEIR OVERFLOW RATE = Flow (gpm) ÷ Feet of weir
SPECIFIC CAPACITY = Well yield (gpm) / Drawdown (feet)
FILTRATION RATE: for every 1.6 in./min. of rise or fall = 1 gpm/ft^2

$$\text{Lbs. of chemical} = \frac{ppm \times 8.34 \times MG}{\%\ purity}$$

$$\text{Specific Gravity} = \frac{\text{wt. of a particular liquid}}{\text{equivalent wt. of water}}$$

Cl_2 Dosage = Demand + Residual

$$ppm = \frac{\text{lbs. of chemical} \times \%\ purity}{8.34 \times MG}$$

$$\text{Strength of Solution} = \frac{\text{wt. of chemical}}{\text{wt. of solution}}$$