Reference & Formulas:

Weight of Water, 1 gallon = 8.338 Lbs (at 60 F)
Volume of Water, 1 gallon = 7.4805 Cu. Feet

ANSI Class	Rating (PSI)
125	175
150	285
300	740
600	1480

V = GPM/D^2 * 0.4085 (Velocity of water)

V = Velocity in FPS (feet per second)
GPM = water flowrate in gallons per minute
D^2 = pipe inside diameter (in inches) squared

GPM = Cv * (SqRoot of delta P) (Flow thru a valve or orfice)
GPM = water flowrate in gallons per minute
Cv = Vale flow coefficient (no units)
delta P = pressure drop across valve in psi

HP = (GPM x TDH / Eff. X 3960) x SG (Pump power, flow & pressure)

HP = Required horsepower
GPM = Flowrate in gallons per minute
TDH = Discharge Head in Feet
Eff. - Efficiency in %
3960 = Constant
SG = Specific gravity = 1.0 for water

KW = HP x 0.7457

Affinity Laws; (Pump Flow vs RPM vs Head vs Power)

Q1/Q2 = N1/N2
H1/H2 = (N1/N2)^2
BHP1/BHP2 = N1^3/N2^3

Q = flowrate
H = head (in Ft)
N = speed (in rpm)
BHP = brake horsepower (in HP)

1 BTU = energy to rasie 1 LB water 1 deg F (Heat Load Calculation)

BTU/Hr = (GPM)*(delta T)*(C)
GPM = flowrate in gallons per minute
delta T = temperature difference in Deg F
C = 504, constant for 100% water
C = 433, constant for 50% water / 50% Glycol mix