Useful Formulas

- *Total Heat (BTU/hr) = 4.5 x cfm x Δh (std. air)*

- *Sensible Heat (BTU/hr) = 1.1 x cfm x Δt*
- *Latent Heat (BTU/hr) = 0.69 x cfm x Δgr. (std. air)*
- *Total Heat (BTU/hr) = 500 x gpm x Δt (water)*
- *TONS = 24 x gpm x Δt (water)*
- *GPM cooler = (24 x TONS) / Δt (water)*

- *Fluid Mixture* $T_m = (Xt_1 + Yt_2) / X + Y$ *(this works for air or water)*
- *BTU/hr = 3.413 x watts = HP x 2546 = Kg Cal x 3.97*
- *Lb. = 453.6 grams = 7000 grains*
- *psi = ft. water/2.31 = in. hg/2.03 = in. water/27.7 = 0.145 x kPa*
- *Ton = 12,000 BTU/hr = 0.2843 x KW*
- *HP (air) = cfm x Δp (in.*H_2O*)/6350 x Eff.*
- *HP (water) = gpm x Δp (ft.)/3960 x Eff.*
- *Gal. =* FT^3*/7.48 = 3.785 Liters = 8.33 lb. (water) =* $231\ in.^3$
- *gpm = 15.85 x L/S*
- *cfm = 2.119 x L/S*
- *Liter = 3.785 x gal = 0.946 x quart =* $28.32 \times ft^3$
- *Therm = 100,000 BTU = MJ/105.5*
- *Watt/sq. ft. =* $0.0926 \times W/M^2$
- *yd. = 1.094 x M*
- *ft. = 3.281 x M*
- $ft^2 = 10.76 \times M^2$
- $ft^3 = 35.31 \times M^3$
- *ft/min = 196.9 x M/S*
- *PPM (by mass) = mg/kg*

NOTE: *Liter/sec is the proper SI term for liquid flow.* M^3*/sec is the proper SI term for airflow. Due to the awkward nature of using* M^3*/S at low air flow rates (lots of decimal points), L/S is commonly used to express air flow for HVAC applications.*