

Properties of Air-Water Mixtures**Definitions and Concepts**

- HVAC – Heating, Ventilation, and Air conditioning
- Psychrometrics – The behavior of mixtures of air and water vapor under varying conditions of heat
- Enthalpy = Total heat in the air = Sensible plus Latent heat
 - Sensible Heat – Changes in temperature that do not alter the moisture content of air
 - Latent Heat – Related to level of moisture in the air
- BTU (British Thermal Unit) – The amount of heat that must be added to or subtracted from a pound of water at 60°F to affect a temperature change of 1°F
 - BTUH or BTU/H – BTU's per hour
 - MBTUH – 1000 BTUH
- Ton
 - 1 Ton equals the amount of heat needed to melt 1 ton of ice in one day
 - 12,000 BTUH's
- Drybulb Temperature – The temperature reading given by a dry thermometer that gives a direct indication as to the sensible heat content of air
- Wetbulb Temperature – The temperature reading from a wetted bulb that gives a direct indication as to the total heat content of air
- Dew Point Temperature – Temperature at which air will begin to release moisture.
- Relative Humidity (RH)
 - The actual amount of moisture in the air expressed as a percentage of the amount of moisture the air is capable of holding.More technically:
 - The amount of water vapor in the air divided by the amount of water vapor the air can hold (at the same temperature and pressure.)
 - The ratio of the air's vapor pressure to its saturation vapor pressure.
 - Example: An air sample that is at 50% RH is holding half the moisture it is capable of holding at the same temperature (at dew point or saturated.)
 - RH is inversely relational to temperature for the same moisture level (grains of moisture per pound of dry air) – warm air can hold more moisture
 - RH is what we sense
 - High RH: Sticking, mold
 - Low RH
 - Affects electronics, promotes static
 - Low RH air is seeking saturation, absorbing moisture wherever it can
- Specific Humidity or Humidity Ratio
 - The weight of the water vapor in each pound of dry air
 - Typically grains of moisture/pound of dry air
 - Grain = 1/7000 pound
- Density – Unit weight of dry air at a given temperature and moisture content, lb/ft³
- Specific Volume – Space occupied by dry air at a given temperature and moisture content (the reciprocal of density), ft³/lb