

**7.17) Psychrometric Principles:**

Water loss sites can have an extensive amount of variables and unknowns, and it would be impossible to formulate an absolute perfect drying equation. Although, when applying psychrometric principles, along with drying experience, constant monitoring and making changes as needed, positive drying results should occur.

Psychrometric principles are structured principles and are the relationship between air, moisture, pressure and temperature:

- **Air:** The mixture of an invisible, odorless, tasteless gases containing nitrogen, oxygen and other elements as measured in volume and weight.
- **Moisture:** A liquid, diffused in smaller quantities, humidity, as measured in grains per pound.
- **Temperature:** A degree of coldness or hotness, as measured on a definite scale.
- **Pressure:** Vapor pressure is measured in pounds per square inch of mercury, while vapor pressure, grains of moisture and specific humidity are related in that their scales are constant with each other.

**7.17.a) Psychrometric Chart:**

With the help of a thermo-hygrometer, the psychrometric chart becomes a valuable tool.

With the known temperature and relative humidity, the psychrometric chart is utilized to obtain the dew point, specific humidity, and grains of moisture per lb. of dry air and vapor pressure. In addition, inform when to apply drying procedures.

A full-scale copy of the psychrometric chart (complements of Dri-Eaz) can be found at the end of this section.

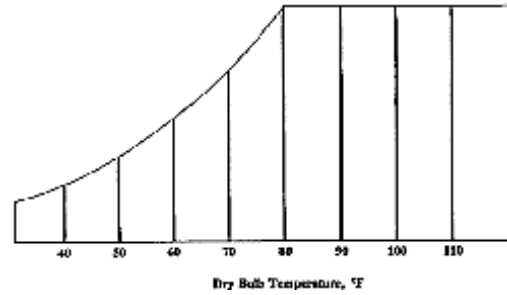
The psychrometric chart contains varying lines and scales, which intersect and provides the relationship between air temperature, relative humidity, and other properties.

To better understand the workings of the psychrometric chart, the following components within the psychrometric chart are separated for ease of location and explanation, as found in Figures 7-17 through 7-17 (e)

**Psychrometric Chart:** A psychrometric chart contains 4 varying lines that run vertically, horizontally, diagonally and in an upward curve as illustrated in Figure 7-17 below. These varying lines represent the performance of the psychrometric chart.

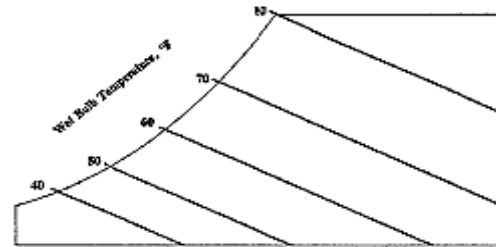
In spite of its complicated appearance in Figure 7-17, the psychrometric chart is easier to follow when broken down:

**Dry Bulb Lines:** Run vertically in 10° increment across the bottom of the chart as shown in Figure 7-17 (a):



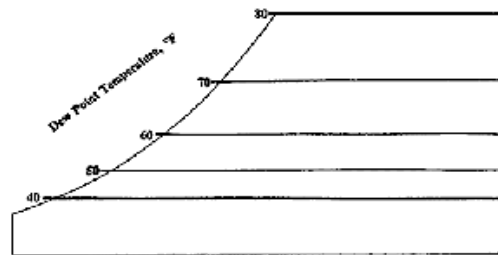
Dry Bulb Lines, Temperature ° F  
Figure 7-17 (a)

**Wet Bulb Lines:** Run diagonally from left to right in 10° increments as shown in Figure 7-17 (b):



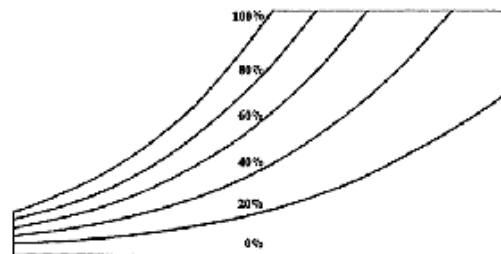
Wet Bulb Lines, Temperature ° F  
Figure 7-17 (b)

**Dew Point Lines:** Run from left to right in a horizontal fashion in 10° increments as shown in Figure 7-17 (c):

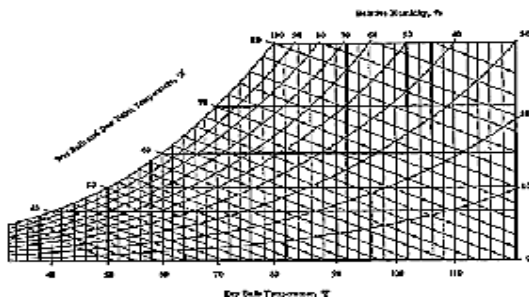


Dew Point Lines, Temperature ° F  
Figure 7-17 (c)

**Relative Humidity Lines:** Run from left to right in an upward curve in 10° increments as shown in Figure 7-17 (d):



Relative Humidity Lines, Percentage %  
Table 7-17 (d)



The Psychrometric Chart  
Figure 7-17

