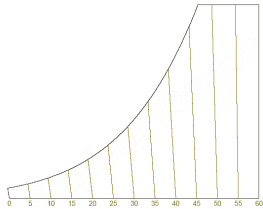


How to use the Psychrometric Chart

DRY BULB TEMPERATURE is the air temperature determined by an ordinary thermometer. Dry bulb temperature is given in weather reports.

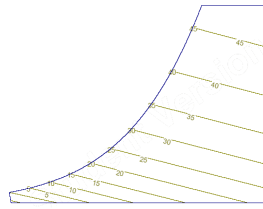
Unit: °C



The dry bulb temperature scale is located at the base of the chart. Near-vertical lines indicate constant dry bulb temperature.

WET BULB TEMPERATURE reflects the cooling effect of evaporating water. It can be determined by passing air over a thermometer that has been wrapped with a small amount of moist cloth. The cooling effect of the evaporating water causes a temperature drop.

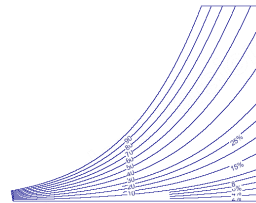
Unit: °C



The wet bulb temperature scale is located along the curved upper left portion of the chart. The sloping lines indicate equal wet bulb temperatures

RELATIVE HUMIDITY (RH) is a measure of how much moisture is present compared to how much moisture the air could hold at that temperature. Relative humidity is given in weather reports.

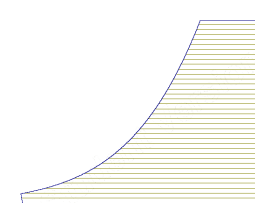
Unit: Percent



Lines representing conditions of equal relative humidities sweep from the lower left to the upper right of the chart. The 100 percent RH (saturation) line corresponds to the wet bulb and the dew point temperature scale line.

The **HUMIDITY RATIO** or absolute humidity is the ratio of the weight of moisture (water) per unit weight of dry air. Humidity ratio is the moisture content of the air (dry basis).

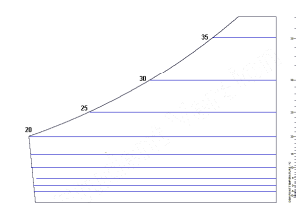
Unit: g moisture per kg dry air



The humidity ratio has its scale on the Y-axis, and lines of constant moisture ratios are horizontal.

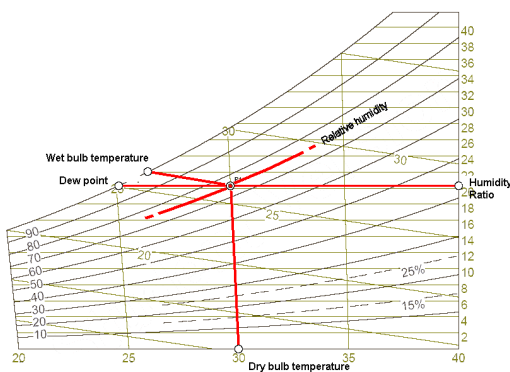
DEW POINT TEMPERATURE is the temperature at which the air with given moisture content (humidity ratio) reaches 100% RH when it is cooled down. At this point condensation starts occurring.

Unit: °C



Saturation temperature lines are parallel to the humidity ratio lines and meet the wet bulb temperature scale at the corresponding wet bulb temperature.

Plotting air properties

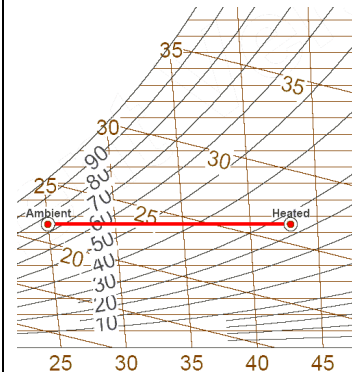


You need any combination of the two parameters above to plot the properties of the air in the chart.

Example: The ambient air has 30°C dry bulb temperature and 26°C wet bulb temperature.

1. Find 30°C dry bulb temperature on the x-axis, move upwards on the 30°C line until it meets the 26°C wet bulb temperature line. Mark the intersection.
2. To determine relative humidity interpolate the relative humidity lines -> in this case around 75%.
3. To find the absolute humidity move right along the humidity ratio line to the right scale -> around 20g water per kg air.
4. To find the dew point move left along the absolute humidity line until the saturation line -> around 25 °C

Example: Heating air for drying



When heating in a paddy dryer the moisture ratio (humidity content) remains the same. The properties of the heated air can be determined as follows:

Example: Ambient air with 25°C, 75% RH shall be heated in a flat bed dryer to 43°C. What is the RH of the drying air?

1. Plot the ambient air properties in the chart.
2. Move along the moisture ratio line to the right until the 43°C dry bulb temperature line.
3. Interpolate RH -> 25%