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MOISTURE AND RELATIVE HUMIDITY

A psychometric chart aids in understanding the dynamics of moisture control. A simplified chart shown in Figure 3-4 relates temperature and moisture. Note that at a single temperature, as the amount of moisture increases (moves up the vertical axis), the relative humidity of the air also increases. At the top curve of the chart, the relative humidity reaches 100% — air can hold no additional water vapor at that temperature, called the *dew point*, so condensation can occur.

Winter Condensation in Walls

In a well built wall, the temperature of the inside surface of the sheathing will depend on the insulating value of the sheathing and the indoor and outdoor temperatures.

Example: When it is 35°F outside and 70°F at 40% relative humidity inside:

- ❑ The interior surface of plywood sheathing will be around 39°F.
- ❑ The interior surface of insulated sheathing would be 47°F.

The psychometric chart can help predict whether condensation will occur:

1. In Figure 3-5, find the point representing the indoor air conditions.
2. Draw a horizontal line to the 100% RH line.
3. Next, draw a vertical line down from where the horizontal line intersects the 100% RH line.

In the example, condensation would occur if the temperature of the inside surface of the sheathing were at 44°F. Thus, under the temperature conditions in this example, water droplets may form on the plywood sheathing, but not on the insulated sheathing.

Summer Condensation in Walls

Figure 3-6 depicts a similar case in summer. If the interior air is 75°F, and outside air at 95°F and 40% relative humidity enters the wall cavity, will condensation occur on the exterior side of the drywall, which would be about 73°F? Using the psychometric chart, we find that the dew point of the outside air leaking into the wall cavity would be about 67°F. Since the drywall temperature is greater than the dew point, condensation should not form.

Figure 3-4
Psychometric Chart

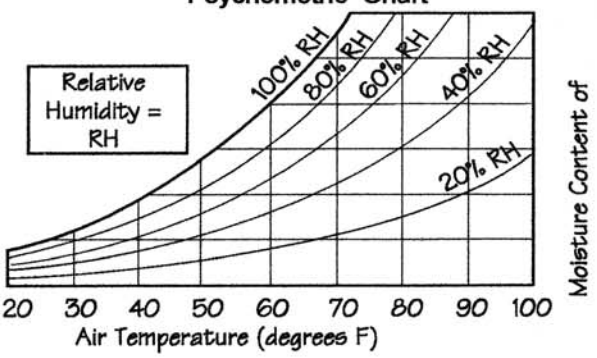

Figure 3-5
Winter Dewpoint Temperature Inside Walls

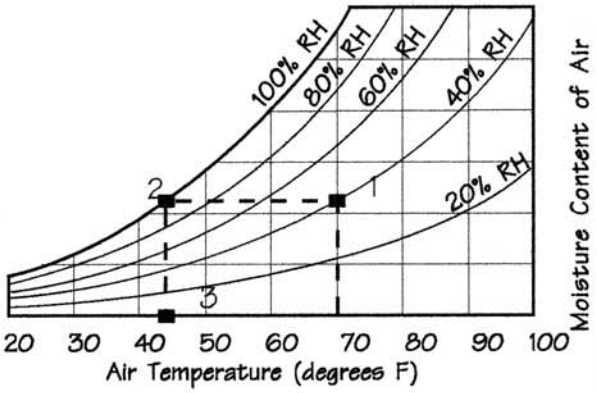

Figure 3-6
Summer Dewpoint Temperature Inside Walls