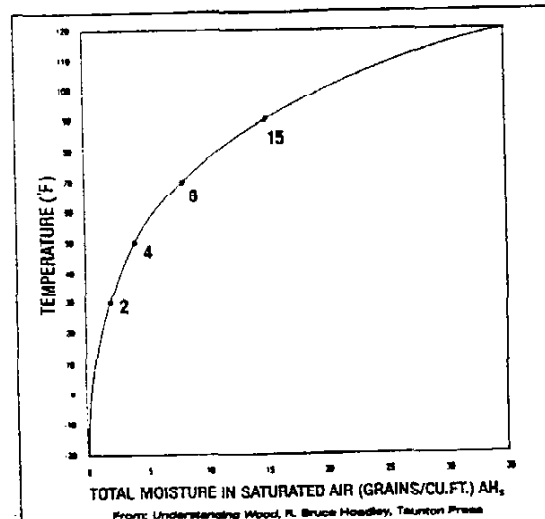


Words to The Wise

Dewpoint & Humidity

Two common scenarios explain why interior relative humidity varies so much from season to season. Relative humidity (expressed as a percentage) is a measure of the amount of actual moisture in the air (absolute humidity, or AH) divided by the maximum amount of moisture the air can contain at a given temperature (absolute humidity saturated, or AHs). The chart shows the AHs--the amount of moisture, in grains per cubic foot, that air can contain at various temperatures. For example, at 30 degrees Fahrenheit, air can contain a maximum of 2 grains of moisture per cubic foot. That's the AHs for that temperature. If the air contains 1 grain (its absolute humidity),



the relative humidity of the air is 50 percent--1 grain (AH) divided by 2 grains (AHs). Here's how that affects the relative humidity of interior air in winter and summer:

1. In winter, say the outside air temperature is 30 degrees and the relative humidity is 50 percent. The dewpoint chart shows us that at 30 degrees, saturated air can contain a maximum of 2 grains of moisture per cubic foot. At 50 percent relative humidity, the air holds 1 grain per cubic foot. Now bring that same air inside, with the same amount of moisture, then heat the air to 70 degrees. The chart shows that at 70 degrees, the air will hold a maximum of 8 grains of moisture per cubic foot. However, we haven't added any moisture to the air, the AH is still 1 grain per cubic foot. Divide that by the AHs of 8 grains per cubic foot and you have an interior relative humidity of 12.5 percent. That explains why interior humidity drops so much during the winter months: Air containing a fixed amount of moisture has a lower relative humidity at higher temperatures than it does at lower temperatures.

2. Conversely, say the relative humidity outside is 50 percent in summer, with at temperature of 90 degrees. That chart shows that at 90 degrees, the air will hold a maximum of 15 grains of moisture per cubic foot. At 50 percent relative humidity, the air holds 7.5 grains. Now bring that air into the house and cool it to 70 degrees. The AHs is 8 grains and we haven't subtracted any moisture from the air, so the AH is still 7.5, which means the relative humidity is 93.75 percent. That explains why interior humidity increases so much during the summer months: Air containing a fixed amount of moisture has a higher relative humidity at lower temperatures than it does at higher temperatures.