B. Wood's Comfort Zone

1. As a general rule, with geographic exceptions, wood flooring will perform best when the interior environment is controlled to stay within a relative humidity range of 30 to 50 percent and a temperature range of 60° to 80° Fahrenheit. (In some climates, the ideal humidity range might be higher or lower, 25 to 45 percent or 45 to 65 percent, for example.)
2. The chart below indicates the moisture content wood will likely have at any given combination of temperature and humidity. Note the equilibrium moisture content in the recommended temperature/humidity range (shaded area) coincides with the 6-to-9 percent range used by most flooring manufacturers during the manufacturing/shipping process. Although some movement can be expected between 6 and 9 percent, wood flooring can shrink or swell more dramatically outside this range. When wood is neither gaining nor losing moisture, equilibrium moisture content (EMC) has been reached.

Equilibrium Moisture Content of Solid Wood Species at Various Temperatures and Relative Humidity Readings

Wood flooring has a comfort level too. Wood flooring will perform best when the interior environment is controlled to stay within a relative humidity range of 30% to 50% and a temperature range of 60° to 80° Fahrenheit. Fortunately, that's about the same comfort range most humans enjoy. The chart below indicates the equilibrium moisture content of wood flooring at various temperatures and humidity conditions. The left column indicates temperature in degrees Fahrenheit and Celsius. The bottom row indicates percent relative humidity. The values in the chart indicate the equilibrium moisture content (EMC) for any given combination of temperature and humidity. For example, at 70° Fahrenheit and 40% relative humidity, the equilibrium moisture content is 7.7%. The shaded area indicates the generally recommended range for wood flooring – 6% - 9% EMC, which occurs when temperature is 60° - 80° Fahrenheit or 15° - 26° Celsius, and 30% - 50% relative humidity.

°F / C	EMC	EMC	EMC	EMC	EMC	EMC	EMC	EMC	EMC	EMC	EMC	EMC	EMC	EMC	EMC	EMC	EMC	EMC	EMC	EMC
30 / -1	1.4	2.6	3.7	4.6	5.5	6.3	7.1	7.9	8.7	9.5	10.4	11.3	12.4	13.5	14.9	16.5	18.5	21.0	24.3	26.9
40 / 4	1.4	2.6	3.7	4.6	5.5	6.3	7.1	7.9	8.7	9.5	10.4	11.3	12.4	13.5	14.9	16.5	18.5	21.0	24.3	26.9
50 / 10	1.4	2.6	3.7	4.6	5.5	6.3	7.1	7.9	8.7	9.5	10.4	11.3	12.4	13.5	14.9	16.5	18.5	21.0	24.3	26.9
60 / 15	1.3	2.5	3.6	4.6	5.4	6.2	7.0	7.8	8.6	9.4	10.2	11.1	12.1	13.3	14.6	16.2	18.2	20.7	24.1	26.8
70 / 21	1.3	2.5	3.5	4.5	5.4	6.2	6.9	7.7	8.5	9.2	10.1	11.0	12.0	13.1	14.4	16.0	17.9	20.5	23.9	26.6
80 / 26	1.3	2.4	3.5	4.4	5.3	6.1	6.8	7.6	8.3	9.1	9.9	10.8	11.7	12.9	14.2	15.7	17.7	20.2	23.6	26.3
90 / 32	1.2	2.3	3.4	4.3	5.1	5.9	6.7	7.4	8.1	8.9	9.7	10.5	11.5	12.6	13.9	15.4	17.3	19.8	23.3	26.0
100 / 37	1.2	2.3	3.3	4.2	5.0	5.8	6.5	7.2	7.9	8.7	9.5	10.3	11.2	12.3	13.6	15.1	17.0	19.5	22.9	25.6
% RH	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	98

Chart adapted from Wood Handbook: Wood as an Engineering Material (Agriculture Handbook 72) Forest Products Laboratory, U.S. Department of Agriculture

Coefficients of Change: How Moisture Affects Wood Flooring

See Chapter 9, Solid Strip and Plank Flooring Installation.