# Informational Bulletin #20

**Subject: Seasonal Gaps and Moisture Control**
**Date: 11/28/17**

Even though wood has been cut, dried and milled into flooring, it is still a hydroscopic material and can accept and release moisture. When doing so, it can expand and contract. In extreme high or low moisture conditions, a floor can start to go through unsightly and unexpected changes and in worst cases, cause irreparable damage. The graph below can provide a good understanding of this comfort level.

As you see in the information to the right, the Forest Products Laboratory states that the comfort level of wood is at **60° – 80° and 30% - 50%** relative humidity. These levels have been adopted by the National Wood Flooring Association and most flooring manufacturers as the levels at which hardwood flooring products will perform best. With this understanding of where wood performs best; manufactures have set their warrantee programs to mirror these levels.

**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 percent and a temperature range 60 to 80 degrees Fahrenheit. Fortunately, that's about the same comfort range most humans enjoy. The chart below indicates the moisture content wood will likely have at any given combination of temperature and humidity. Note that equilibrium moisture contents in the recommended temperature/humidity range (shaded area) coincide with the 6 to 9 percent range within which most hardwood flooring is manufactured. Although some movement can be expected even between 6 and 9 percent, wood can expand and shrink dramatically outside that range. See page 6.*

**MOISTURE CONTENT OF WOOD AT VARIOUS TEMPERATURES AND RELATIVE HUMIDITY READINGS**

| Temperature (°Fahrenheit) | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 |
| | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 98 |

Relative Humidity (percent)

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

When flooring is exposed to extreme conditions, either high or low, it will start to expand (when wet) or shrink (when dry). At this point, the floor may start to show evidence of these extreme conditions. Keeping your floors outside of the above mentioned parameters for an extended amount of time may cause irreparable damage. In many cases, exposing wood flooring to levels outside of this zone will void the manufacture's warrantee.

Here are a few things that can be done to help maintain the correct conditions in a home:

- Have a way to monitor temperature and humidity in the home.
  - If the HVAC thermostat does not have the ability to read humidity, inexpensive tabletop units can be purchased at most big box stores.
- If the levels start to go outside the zone; use a humidifier or dehumidifier to control the moisture levels.
  - Standard heating and air conditioning systems may not be effective at controlling humidity levels. Additional humidity controlling devices may be necessary.
- Make sure humidity control devices are maintained and always working properly.

Additional information can be acquired from the manufacturer's technical department of the products used on your floor. The National Wood Floor Association (NWFA) can be an additional resource. They can be reached at 800-422-4556 or online at www.woodfloors.org.

nwfa National Wood Flooring Association MEMBER