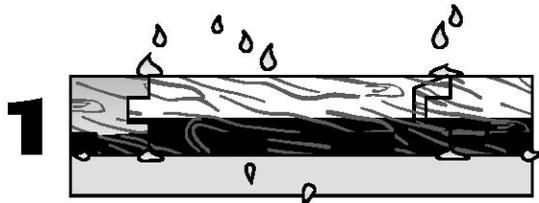


## Wood, Water and Problem Recognition

### How does moisture affect wood flooring?

Wood expands and contracts with humidity. When moisture is absorbed it will expand, and in low humidity settings it will expel moisture causing it to shrink. Before wood can be used for flooring it must be kiln dried. This process removes most of the moisture. It will leave the wood at a moisture rate of about 6%. This it must be properly stored in order to keep the humidity level.

### Cupping?



edges become raised and it will appear like the center is lowered. If the problem worsens you are in jeopardy of your floors buckling. This is when the wood expands so much that has started to pull away from the sub floor.

Cupping is caused when the humidity of the wood has increased. Often you will see this when there has been some sort of water damage such as a leak. You will know that your floor is cupping when the



### Crowning?



the board is raised. If the floor is sanded before the boards have had a chance to thoroughly dry and flatten out on their own, the top surface will initially be flat, while the bottoms of the boards remain cupped.

Crowning is often caused when there was an attempt to fix the cupping prior to the moisture problem being solved. You will know that you have a crowning problem when the center of



### Moisture Content of Wood

Wood fibers are dimensionally stable when the moisture content is above the fiber saturation point (usually about 30 percent moisture content). Below that, wood changes dimension when it gains or loses moisture. Here are some quick points about shrinking and swelling:

- Shrinkage usually begins at 25 to 30 percent moisture content, the fiber

saturation point. Shrinkage continues to zero percent moisture content, an oven-dry state.

- Swelling occurs as wood gains moisture, when it moves from zero to 25 to 30 percent moisture content, the fiber saturation point. Different woods exhibit different moisture stability factors, but they always shrink and swell the most in the direction of the annual growth rings (tangentially), about half as much across the rings (radially) and only in miniscule amounts along the grain (longitudinally). This means that plainsawn flooring will tend to shrink and swell more in width than quartersawn flooring.
- Generally, flooring is expected to shrink in dry environments and expand in wetter environments.
- Between the fiber saturation point and the oven-dry state, wood will only change by about .1 percent of its dimension along the grain (lengthwise in a flatsawn board). It will change by 2 to 8 percent across the grain and across the annular rings (top to bottom), if quartersawn; and 5 to 15 percent across the grain and parallel to the annular rings (side to side), if plainsawn.
- Wider boards tend to move more than narrower-boards. Movement in a 5-inch-wide plank is more dramatic than in a 2<sup>1</sup>/<sub>4</sub>-inch strip.

The ideal moisture content for flooring installation can vary from an extreme of 4 to 18 percent, depending on the wood species, the geographic location of the end product and time of year. Most oak flooring, for example, is milled at 6 to 9 percent. Before installation, solid wood flooring should be acclimated to the area in which it is to be used, then tested with a moisture meter to ensure the proper moisture content. (NWFA)