Installation Expertise with Tim McAdoo

How Moisture Affects Hardwood Flooring

Wood flooring is a natural product that responds to humidity variations by expanding and contracting even though the wood has been dried, cut and processed into flooring. Sometimes these changes may be noticeable. During warm and humid summers wood expands. During dry winter weather, hardwood contracts. This seasonal movement is normal for hardwood flooring. The best way to reduce such movement is by installing humidity controls and making sure that they function before flooring is installed.

Wood is a hygroscopic material. This means that when wood is exposed to air, it will dry or pick up moisture until it is in equilibrium with the humidity and temperature of the air. Moisture absorption causes wood to swell. Moisture loss causes wood to shrink. Shrinkage of wood begins at 25-30% moisture content. Swelling occurs as wood increases in moisture content from 0% to 25-30% moisture content. Above 25%-30% wood is dimensionally stable.

Hardwood does not shrink or swell equally in all directions. A change in moisture content of a wood piece from 0% to 28% will increase the size of the piece approximately 0.1% along the **length** of the board, and 5% to 15% change in size in **width** of the strip with plain sawn flooring.

Winter Time

In the winter time when homes are heated and the air is dry, wood flooring gives up some of its moisture and contracts as a result. When this happens, thin gaps can appear between planks. This is normal, and a homeowner should be prepared for it to occur. Once indoor heating is turned off in the spring and humidity levels rise again, most of the gaps will close up.

To avoid these separations, try to control and monitor air humidity levels during the dry season by installing a humidifier in the furnace or bringing a movable humidifier into the room that has good air circulation. Optimal humidity level falls in 40-60% range. As long as humidity does not fall lower than 40%, no gaps at all will appear between the planks. Installing a simple humidity meter will allow you to monitor and control humidity levels in your home all year round.

Summer Time

During warm and humid summers when indoor humidity can rise up to 90%, the opposite occurs. Wood absorbs moisture from the air and expands as a result. Even just a few days of exposure to high humidity can cause wood flooring to cup. When a wooden board cups, its edges are higher than its center. Cupping can also happen when spilled water is absorbed by the wood. Once cupping has occurred, it takes a while for the wood to restore its internal moisture and flatten out.

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When extensive moisture or humidity causes the wood to expand significantly, adjoining boards start pressing against each other. In extreme cases, this increased pressure can cause the affected boards to lose their structural integrity and crack. To avoid cupping, keep indoor humidity level in your home or job site (prior to hardwood installation) within 40-60% range. Never allow indoor humidity to rise over 65%. Maintain optimal humidity levels by keeping air conditioner or dehumidifier running during hot humid summer weather.

KNOW YOUR WOOD FLOOR

Wood Flooring Expansion and Contraction

Unlike many floor coverings, wood floors can last the lifetime of the building in which they are installed. Home owners who want them to last that long, however, should note the number one enemy of a hardwood floor: moisture. Wood floors naturally expand when moisture is present and shrink when it is not. Whether the reactions are a problem or not depends on the severity of the situation. Following are some of the common results when water and wood floors combine.

CRACKS BETWEEN BOARDS: Almost every wood floor endures some expansion and contraction as seasons and humidity levels change. When homes are heated, humidity levels plummet, boards shrink and spaces appear between the boards. In dry months, cracks can easily develop to the thickness of a dime on a typical solid 2¼ inch oak floor, with light-colored woods making the cracks appear larger. Plank floors also will show cracks more. These spaces are to be expected and usually close up as the season changes and moisture returns to the air. To reduce the degree of change, home owners can add moisture to the air during the dry months, ideally by installing a humidifier in the furnace.

CUPPING: As with cracks between boards, both cupping and crowning are natural reactions to moisture and should not be a concern if they occur only to a minor extent. More severe cases, however, indicate a serious moisture problem.

"Cupping" describes a condition in which the edges of a board are high and its center is lower. Humidity is usually the culprit, although cupping also can happen after water has been spilled onto the floor and absorbed into the wood. The moisture causes the wood to swell, crushing the boards together and deforming them at the edges. In order to repair the floor, the cause of the moisture must be identified. Most often, indoor humidity will have to be controlled. Other causes could include situations such as a plumbing leak in the basement, which can allow moisture to migrate up into the subfloor and

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flooring.

Once the cause of the moisture is controlled, cupping usually can be reversed. Oftentimes the floor Cupping may naturally dry out and improve over time. Fans may be necessary to speed the drying process. After the floor has dried, it may be necessary to recoat the floor with finish, or to sand and refinish the floor.

CROWNING: "Crowning" is the opposite of cupping: The middle of the board is higher than the edges of the board. This can occur when the surface of the floor encounters moisture. More often, it results when a floor has been sanded too soon after it has cupped. When this happens, the top edges of the board are sanded off, and thus are lower than the rest of the board when it returns to a normal moisture content.

BUCKLING: Buckling is one of the most extreme reactions to moisture that can occur with a hardwood floor. It happens when the floor literally pulls away from the subfloor, up to heights as high as several inches. Fortunately, buckling is an uncommon occurrence, usually happening only after a floor has been flooded. Even in such cases, it is possible that a floor can be repaired instead of being totally replaced.

Preventing Moisture Problems

Controlling humidity is the most important factor in preventing problems with moisture and your wood floor. The correct maintenance also will go a long way in avoiding problems. Among the key points:

- Clean your wood floor with a cloth lightly dampened by a recommended cleaning product, using the manufacturer's directions for use. It is best to buy a "floor care kit" recommended by your wood floor installer or retailer.
- Do not clean your wood floors with water or water-based products on a regular schedule — clean only when necessary and clean only the soiled areas.
- Never damp mop a wood floor. The water deteriorates the wood and the finish.
- Never let a water spill dry on the floor.

Moisture and Exotic Wood Species

Flooring manufactured from exotic wood species is more demanding than flooring made from domestic woods. For this reason, a set of additional requirements has to be met when installing and maintaining

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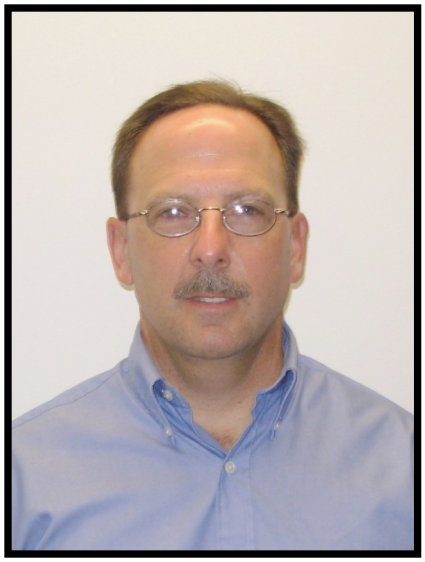
an exotic hardwood floor. Indoor air humidity level must be in the range of 50-70%, and air temperature should be kept in the range of 65°F - 75°F.

In order to meet these requirements, use an air humidifier during the dry season, and use an air conditioner to maintain acceptable humidity during humid summers. We recommend buying a combined digital temperature/moisture meter in order to monitor indoor conditions all year round.

About Tim McAdoo:

Tim is a certified instructor for Armstrong/Bruce, Avaire, Konecto and Starloc products an has been a member of the Armstrong Installation Training Team since 1984. Tim has highly developed installation skills and qualifications that have been combined over his 32 years in the floor covering industry. Tim is privy to all the latest innovations and techniques used in the installation of their products.

We are sure you will find your skills improved after attending one of his installation courses.



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