Denver
HARDWOOD CO.

CRACKS IN YOUR HARDWOOD FLOOR?

It's that time of year again in the Rocky Mountains when we start to see "cracking" in wood floors. This is seasonal and common in wood flooring.

Wood flooring, being a product of nature, has some water in it at all times; this moisture content in the wood changes as the moisture in the environment changes. When the ambient air dries out, the wood dries out and shrinks. This causes the "cracking" between the boards.

Cold winter weather hits wood flooring twice. When temperatures drop homeowners turn on their heating systems and keep doors and windows closed. This heat dries out the home and moisture is pulled from the wood causing the wood to shrink and "cracks" to appear. This can be somewhat minimized by having a humidifier attached to the heating system. Wood stoves are especially bad for drying out the inside air as well as areas directly around furnaces, heating ducts and base board heaters.

The second factor that affects wood floors is when the air temperatures fall below freezing. Most of the moisture in the air falls out as snow, frost, or ice. So, when we get a long cold spell with ice or snow we experience a lot more shrinkage and cracking.

As temperature and humidity changes occur in summer, seasonal cracking should remedy itself. As moisture is replaced back into the air, moisture is also absorbed back into the wood. Expansion occurs and wood floors return to their original state before the winter season.

It is recommended that you do not fill your wood floor throughout the winter months. When the wood expands again in the summer, the wood will either force out the excess fill or boards will warp. Wood must go somewhere as it expands, the force of this expansion can be significant.

It is important to remember that this shrinkage is not a flaw in the wood or an installation related problem. If you desire additional information concerning wood flooring seasonal movement, please contact any of the Denver Hardwood sales people.

Sincerely,

Denver Hardwood Company

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THE BEHAVIOR OF WOOD

Any article made of wood is liable to more or less warp due to changes in humidity. Wood is a hygroscopic material which means it tends to give off its moisture to a dry atmosphere until equilibrium between the two is established. Approximately 1% dimensional change takes place with each 3% change in the moisture content of the wood. This applies to hard woods more than soft woods and maple being one of the hardest of the hard woods, the action and changes are more defined.

Air can hold a certain amount of moisture at a certain temperature. Relative Humidity expresses what percentage of this maximum is actually being held by the air. Warm air can hold a great deal more moisture than cold air. For example, if we take a sample of air at 32 degrees and 100% relative humidity and heat it to 75 degrees, its relative humidity will drop to 20%. Thus we can easily see that heating the air will lower the relative humidity appreciably.

From the above mentioned principles, it can readily be understood how changes in relative humidity can adversely affect wood.

During the colder season of the year, outside air, which can hold little moisture, enters the room and heated to room temperature. As the air is heated its relative humidity becomes very low; if additional moisture at the higher temperature is supplied, this moisture must be supplied from items in the room. Wooden articles (since they are hygroscopic in nature) are good suppliers of moisture to the "thirsty" air. In giving off moisture, the drying action takes place in the wood. Results of this shrinking, if severe enough, can be observed by checking, delaminating, splitting and warping. Raising the relative humidity has a swelling effect on the wood and will sometimes close checks and splits.

No matter how thoroughly lumber is seasoned, preshrunk, or finished, some shrinking and swelling in service is inevitable because wood is seldom used under constant atmospheric conditions. Since wood is hygroscopic and responds to changes in relative humidity, its moisture content is constantly changing. Wood in service generally reaches average moisture content and changes in relative humidity cause fluctuations about this average.

These changes in moisture content do not follow immediately after the changes in atmospheric conditions due to the effectiveness of the finish as a moisture barrier. Even the best of finishes are not one hundred percent effective and they will eventually allow the wood to come to equilibrium with the air if conditions are maintained over a long enough period of time.

Since relative humidity is the most important factor in keeping the wood in good condition every effort should be made to maintain a relative humidity of approximately 35 to 45 percent whenever possible during the heating season. Wood should never be stored in a damp atmosphere. Special attention should be given to the end grain so that it is completely sealed. Unit heaters are particularly harmful to wood, in that they blow hot air on the top surface only. The sudden change in temperature and the extreme dryness of the air can easily cause warping and checking. Exposure of the wood to the direct rays of the sun can cause similar damage.

Pro Tips HELP & HINTS FOR HARDWOOD FLOORING PROFESSIONALS

by Erick Proulx, Technical Services, Metropolitan Hardwood Floors

Topic: The Heat is On

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Every year, the onset of winter brings a predictable flurry of hardwood flooring problems, so it seems timely to revisit some of the most common complaints and how best to handle them. The biggest culprit by far is heat and humidity.

Like it says in every hardwood maintenance brochure, maintaining heat and humidity at recommended levels is essential to the health and well-being of a hardwood floor.

The trouble is that maintaining those levels takes a little more work and attention during winter months, whether the home is occupied or not.

Take a full time residence. In the winter time, the occupants will be using some kind of heating system to keep the interior at a comfortable temperature – and if it's comfortable for people, it's likely a good temperature for the wood floor as well. The recommended level is between 18 and 24°C, or 65 to 75°F.

The problem is that heating up a space tends to dry it out, so while the interior may be plenty warm, it may not have sufficient humidity. (For the record, the recommended humidity level is between 35 and 55%.)

If the interior conditions are too dry, the flooring will let you know pretty quickly. If it's a solid wood floor, it will start to 'gap' as the individual boards shrink, opening up gaps between boards. In an engineered floor, only the hardwood wear layer shrinks (the plywood base is more stable and doesn't react as much to the change in climate) resulting in 'cupping', in which the edges of individual boards curl up, creating a concave surface.

Dealers can expect some concerned calls from customers who have had floors installed in the past six months and who have not yet lived through winter with their hardwood, usually citing one of the above conditions. In most cases the problem will be directly related to improper heat and humidity, and can be easily rectified. (Installing a humidifier is often the quickest fix for a too-dry climate.) The good news is that heat & humidity related problems – be it gapping, cupping or whatever – will usually right themselves pretty quickly once the H&H levels are corrected.

Winter time can also cause problems in unoccupied premises. Whether it's a vacation cottage that's closed up for several months, or a condo that's shut for a month while the owners vacation in a sunspot, or a ski chalet that's only used a few weeks out of the winter – if the premises are left unheated while unoccupied, the opposite situation arises: moisture tends to accumulate, causing the floor boards to swell and buckle. Again, the situation will usually correct itself when the H&H levels are brought into line, but the best cure is prevention.

(Needless to say, the likelihood of these scenarios happening in your market will depend somewhat on local climate conditions, which vary enormously across Canada. The bottom line is that special attention has to be paid to maintaining heat and humidity conditions during the winter months whatever the locale – and regardless whether or not the house is occupied.)

Oh, and it's not just customers who have to be reminded to keep an eye on H&H levels at this time of year; installers also need to pay special attention, especially in new home construction jobs. It's often more difficult to get site conditions under control – and keep them there – during winter months.

It's also important to ensure a generous acclimatization period prior to installing as the product is more likely to have undergone some severe changes in temperature enroute to the site.

For the Customer: How to Spot and Avoid Trouble in Hardwood Floors

In a comfortable home with slight humidity variations through the seasons, wood flooring responds by expanding and contracting. These changes may be noticeable. During warm, humid weather, wood expands. During dry weather, wood contracts. This seasonal movement is a normal characteristic of wood flooring, and it never stops, regardless of the age of the wood. One of the best ways to ensure that wood flooring will give the performance homeowners expect is to install humidity controls and ensure that they are functioning before the flooring is installed.

Working with humidity controls

A homeowner who chooses hardwood flooring is making an investment in a floor that will last 40 years or more, and he or she should protect that investment by installing humidity controls — a tool that helps the floor maintain a beautiful, trouble-free appearance.

Cracks and separations between boards

Nearly every floor endures some separation between boards. In winter, when homes are heated and the air is dry, wood flooring gives up some of its moisture and therefore shrinks. When that happens, thin cracks appear between. This is normal, and homeowners should be forewarned of this. It is acceptable, and customers should not be calling the installers at the first sign of cracks. Once the indoor heat goes off in the spring, and the indoor environment regains moisture, most of these cracks will close up.

Cracks in winter — in the drier months — may easily develop to the thickness of a dime (⅛ inch) for solid 2¼-inch wide strip oak floors. Floors with light-stained woods and naturally light woods like maple tend to show cracks more than darker, wood-tone finished floors.

The cure for cracks? Homeowners should add moisture to the air during dry periods. It's their choice — live with the cracks and wait until spring, or else add humidity by opening the dishwasher after a rinse cycle, switching off the bathroom fan or hanging laundry to dry in the basement near the furnace. Better yet, install a humidifier in the furnace, or an exterior air vent for the furnace burner.

If cracks are a concern, laminated flooring moves less and shows fewer gaps.

Cupping and crowning

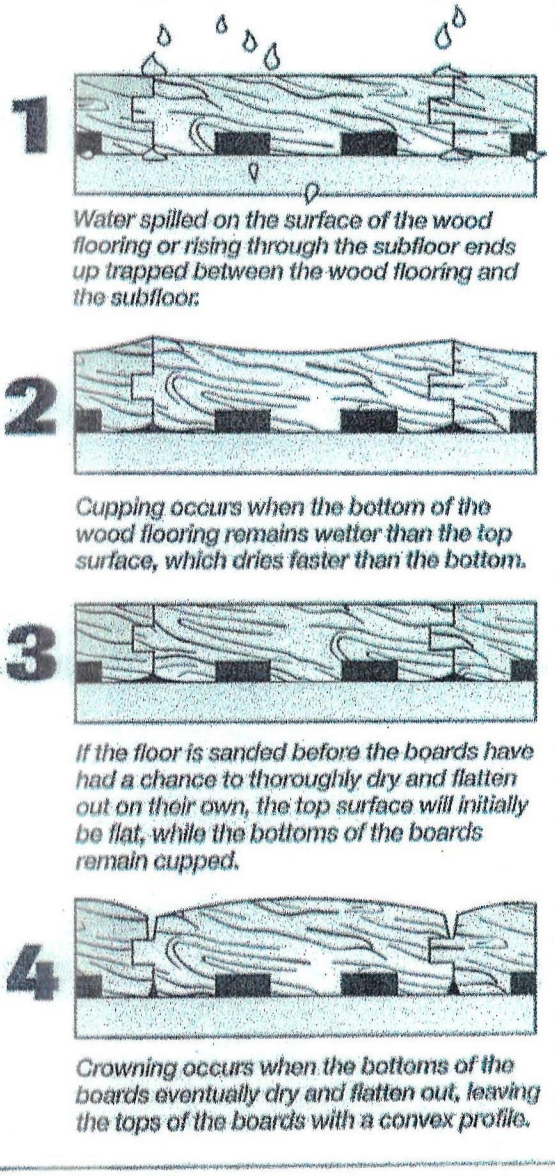
"Cupping and crowning" are common complaints that develop with high humidity. Both problems occur across the width of the flooring material.

Cupping is when the edges of a board are high and its center is lower. It can occur after water spills onto the floor and is absorbed by the wood, but high humidity is more often the cause. If the wood expands significantly, compression set can result as the boards are crushed together, deforming the boards at the edges.

Cupping is caused by a moisture imbalance through the thickness of the wood: The wood is wetter on the bottom of the board than on the top. The moisture imbalance can be proven by taking moisture meter readings at different pin depths.

The first step in repairing a cupped floor is to identify and eliminate the moisture source. In the

Cupping and Crowning



Water spilled on the surface of the wood flooring or rising through the subfloor ends up trapped between the wood flooring and the subfloor.

Cupping occurs when the bottom of the wood flooring remains wetter than the top surface, which dries faster than the bottom.

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.

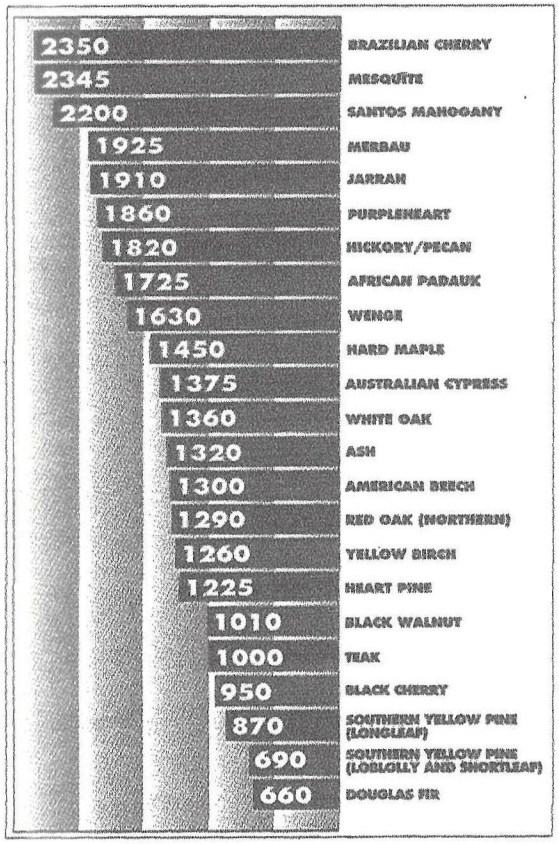
Crowning occurs when the bottoms of the boards eventually dry and flatten out, leaving the tops of the boards with a convex profile.

RELATIVE HARDNESS OF SELECTED WOOD FLOORING SPECIES

(Ranked by Janka hardness rating)

The Janka (or side) hardness test measures the force required to embed a .444-inch steel ball to half its diameter in wood. It is one of the best measures of the ability of a wood species to withstand denting and wear. By the same token, it is also a good indicator of how hard or easy a species is to saw or nail. Northern red oak, for example, has a Janka hardness rating of 1290. Brazilian cherry, with a rating of 2350, is nearly twice as hard. If you're accustomed to working with red oak and decide to tackle a job with Brazilian cherry, you can expect it to be much harder to cut and nail.

• *Source: Hardness ratings for most species taken from* Wood Handbook: Wood as an Engineering Material *(Agriculture Handbook 72, Forest Products Laboratory, Forest Service, U.S. Department of Agriculture; revised 1987), except for Australian cypress, wenge, African padauk, merbau and Santos mahogany, which were provided by International Hardwood Flooring; heart pine by Mountain Lumber, and mesquite by Mesquite Products of Texas.*
• *Douglas fir rating is an average of ratings for Coast, Interior West and Interior North species.*



RELATIVE STABILITY OF SELECTED WOOD FLOORING SPECIES

(Ranked by dimensional change coefficient)

The numbers in the chart reflect the dimensional change coefficient for the various species, measured as tangential shrinkage or swelling within normal moisture content limits of 6-14 percent. Tangential change values will normally reflect changes in plainsawn wood. Quartersawn wood will usually be more dimensionally stable than plainsawn.

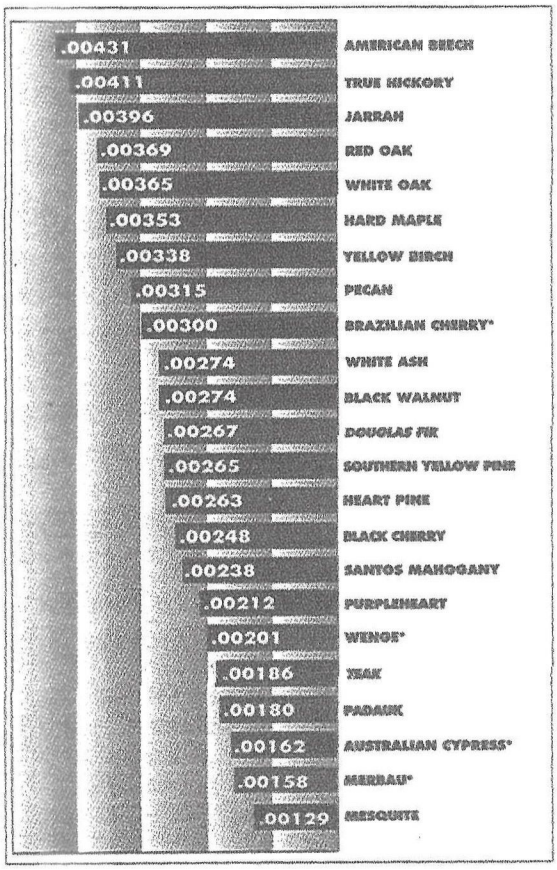
The dimensional change coefficient can be used to calculate expected shrinkage or swelling. Simply multiply the change in moisture content by the change coefficient, then multiply by the width of the board.

Example: A mesquite (change coefficient = .00129) board 5 inches wide experiences a moisture content change from 6 to 9 percent — a change of 3 percentage points.
Calculation: 3 x .00129 = .00387 x 5 = .019 inches.

In actual practice, however, change would be diminished in a complete floor, as the boards' proximity to each other tends to restrain movement.

The chart is best used for comparison.

* Although some tropical woods such as Australian cypress, Brazilian cherry, merbau and wenge appear in this chart to have excellent moisture stability compared to domestic oak, actual installations of many of these woods have demonstrated significant movement in use. To avoid problems later, extra care should be taken to inform potential users of these tendencies prior to purchase.



• *Source: Stability ratings taken from* Wood Handbook: Wood as an Engineering Material *(Agriculture Handbook 72, Forest Products Laboratory, Forest Service, U.S. Department of Agriculture; revised 1987).*