Installation Expertise with Tim McAdoo

Acclimation of Hardwood Flooring

All hardwood products are affected by environmental conditions. Acclimate the new flooring in the areas to be installed to normal lived-in conditions while in the boxes. If products are protected in plastic open the ends of the boxes. Length of time is not the determining factor. The goal is to reach an equilibrium or moisture balance between the new flooring with its surroundings before installation. This balance could be achieved in as little as 1 to 5 days, or longer for some exotic species. As a general rule, hardwood 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. Garages, basements and exterior porches are not acceptable areas to store and acclimate hardwood flooring.

When hardwood is neither gaining nor losing moisture, equilibrium moisture content (EMC) has been reached. Hardwood flooring is a hydroscopic material which will change in dimension as a result of changes in humidity in the surrounding environment. Improper acclimation can result in excessive shrinkage, expansion, dimensional distortion, or structural damage. The equilibrium moisture content in the recommended temperature and humidity range (shaded area in the chart below) 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. 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. 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 and 9 percent EMC, which occurs when temperature is 60° - 80° Fahrenheit, and 30% - 50% relative humidity.

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.

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At 70° Fahrenheit, a relative humidity of 25 percent gives an equilibrium moisture content (EMC) of 5 percent, and a relative humidity of 75 percent gives an EMC of 14 percent. A 50 percent variance in relative humidity produces an EMC change of 10 percent. How that affects wood flooring depends on which species is being used. However, let's say the width variation is just 1/16 inch for a 2¼ inch board. That's one full inch over 16 boards in a floor. Over the width of a 10 foot wide floor, that amounts to more than three inches of total expansion or contraction. Protective coatings cannot prevent wood from gaining or losing moisture, they merely slow the process.

Engineered hardwood claims it does not need to be acclimated, but it also says the hardwood should be within a certain percentage of the subfloor. The only way to achieve this is through acclimation. Maintaining the recommended acclimation levels after the installation will minimize board movement, excessive squeaks and gaps. Proper jobsite conditions, acclimation and moisture testing the subfloor and new flooring and all work together for the success of the installation.

1. Acclimation can be achieved by breaking the floor units into small lots and/or opening the packaging. A common practice is to cross-stack the materials with spacers (¾″ to 1″ sticks) between each layer of flooring to allow air circulation on all sides of all boards.
2. Most recommendations state that the materials need to acclimate from a minimum of 3 days up to no given maximum. While it takes time to acclimate a product, the most important aspect is that the materials reach a moisture content that is in equilibrium with its expected use. Acclimate the materials as long as necessary to accomplish this task, taking the necessary moisture readings to indicate when the materials have reached the proper moisture content and when no further changes occur.

Acclimation Tips

- Acclimate the product for a minimum of 72 hours or as long as needed in order to meet the proper installation requirements.
- Opening of the cartons will help to better acclimate material. If wrapped in plastic, open the plastic.
- Do not store materials directly on concrete, elevate material at least 4″ above the concrete.
- Do not deliver material in inclement weather.
- Always store material in a dry place.
- Don’t acclimate too soon after construction. Some compounds, like drywall compound and paint for instance, will put moisture into the air as they dry. Wait until all compounds have dried and the house has stabilized around normal occupancy conditions.

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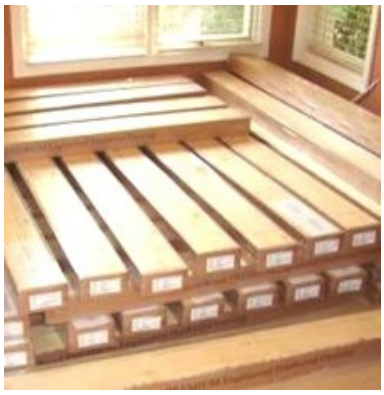
Cartons ends and Plastic opened up



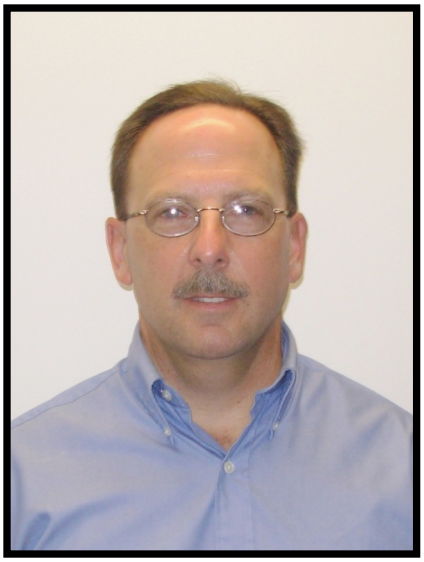
Cartons elevated from subfloor and cross stacked for air circulation

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.

To view a complete list and register for one of Tim's installation trainings, click here on the QR or visit: http://www.jjhaines.com/for-customers/installation-training/



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