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Custom Wood Flooring & Millwork

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HARDWOOD FLOORING INSTALLATION & MAINTENANCE

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Wood floor acclimation is “the process of adjusting (conditioning) the moisture content of wood flooring to the environment in which it is expected to perform.”

Unfortunately there is a common misconception that if you bring wood flooring into the workplace and let it sit for a few days, it will acclimate properly and be ready to install.

Contrary to this belief, ***wood floor acclimation has less do with the amount of time you should let flooring sit to acclimate on the job site, and more to do with monitoring the moisture content of various components.*** Wood flooring will always perform best when the environment is controlled and remains within a relative humidity range of 30-50%. Temperature should also be controlled within a range of 60-80 degrees Fahrenheit.

Hardwood flooring is a hydroscopic material which will change in dimension as a result of changes in humidity in the surrounding environment. When hardwood is neither gaining nor losing moisture, equilibrium moisture content (EMC) has been reached. Improper acclimation can result in excessive shrinkage, expansion, dimensional distortion, or structural damage. The EMC in the recommended temperature and humidity range (shaded area in the chart below) coincides with the 6% to 9% range used by most flooring manufacturers during the manufacturing/shipping process. Although some movement can be expected between 6% and 9%, wood flooring can shrink or swell more dramatically outside this range.

Remember: Protective coatings cannot prevent wood from gaining or losing moisture; they merely slow the process.

Moisture Content of Wood
At Various Temperatures and Relative Humidity Readings

Temperature																		
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
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
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
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
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
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
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
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
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90

Relative Humidity (Percent)
Forest Products Laboratory, U.S. Department of Agrculture

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Let's look at an example: At 70° Fahrenheit, a relative humidity of 25% gives an EMC of 5%; and a relative humidity of 75% give an EMC of 14%. A 50% variance in relative humidity produces an EMC change of 10%. 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.***

JOB SITE PREPARATION

Make sure the job site is ready for the wood, and the wood is ready for the job site. The following conditions should always be established ***before*** wood flooring is delivered:

1. The building is completely enclosed (doors and windows installed).
2. Final grading has been completed and all drainage runs away from the building.
3. All wet construction elements are completed and dry (concrete, plastering, drywall, tile work, laminates & priming and painting).
4. Basement and crawl space areas are dry with dehumidifiers at the ready during the wet seasons.
5. Air conditioning and or heating are functional and have been running for 5 days prior to installation.
6. When appropriate humidity (minimum of 30% to a maximum of 50%) and temperature inside building (60 to 80 degrees) has been achieved, Part 1 of the environmental aspect has been achieved.
7. When the relative humidity and temperature has been stabilized and the flooring and subfloor moisture content is within 1%–1 ½% of each other, the environment is then technically sound to proceed with the installation; this is Part 2 of the environmental aspect.
8. Do not proceed with installation until both parts of the environmental aspect have been achieved. It is entirely conceivable that the temperature and relative humidity have been achieved yet the subfloor could be several percentage points greater than the flooring. A proper installation will result when the moisture content in the subfloor is driven lower.

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Time on Job Site: 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 and the environment is consistent and stable in temperature and relative humidity.

INSTALLATION RECOMMENDATIONS

- Always perform a thorough testing of moisture content of the subfloor throughout the entire installation area and record the readings. Create a grid and record the readings. Replicate reading process at a later date and compare. Provide results to the builder or homeowner, keeping a copy for your records.
- Make sure the area below the flooring is dry and have dehumidification at the ready at all times. The use of box fans to slowly move the air will assist in the dehumidification process. We recommend using a trowel-on vapor barrier like Bostik's MVP 4 in the basement or a similar product from another reputable vendor. If the slab is heated or thermally protected, this may be less of an issue, although concrete will effervesce moisture for well over a year. Always err on the side of caution.
- It is critical that the subfloor is clean and void of dirt, dust, plaster, etc. Sweeping alone is insufficient and will increase the likelihood of adhesive failure. Always vacuum and consider using damp rags to further clean, and allow time to completely dry.
- We recommend using trowel-on moisture retardant on the main floor such as Bona Product R580. This makes for excellent moisture retardance and serves as an excellent base to glue to.
- If you are not using a moisture retardant like Bona R580, it is highly recommended to trowel on Bona 851 Adhesive or similar product from a reputable vendor that will provide excellent adhesion and some moisture retardance at the same time.
- Leave a gap of 5/8" to ¾," or more, depending on the depth of the baseboard, to allow for expansion.
- Screw down subfloor to eliminate squeaks. Nails/ring nails will not hold over time.
- Subfloors should be a minimum of ¾" and should not consist of particle board. Advantech or similar products are highly recommended.

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- Do not install over linoleum or over levelers. Get down to a clean subfloor. Leveling should take place under the existing subfloor or be built up above using wood products, ***not*** trowel-on solutions.
- For flooring that is 4” or less, use a product like AquaBar B from Fortifiber Building Systems Group that also serves as a true moisture vapor retarder, ***not*** Red Rosin paper, which has no moisture barriers and is fragile, ripping easily.
- Use approved adhesives for planks 5” and wider from reputable vendors such as Bona. Adhesives should be used on all 5” and greater floors regardless of heat source, including radiant. Never use Liquid Nails or equivalent hard-drying adhesive. Adhesive must remain flexible and pliable over time. The idea is to minimize movement, ***not*** restrain it.
- Spread nails and or staples no farther than 6” to 8” apart; and when using wider widths (5” and wider), spread nails and staples no more than 6” apart.

For suppliers of the fine products referenced,
contact the following in New Hampshire:

Seacoast Floor Supply
22 Exeter Road
South Hampton, NH 03827
603.944.4653

Wood Pro
7 Raymond Avenue
Salem, NH 03079
603.894.0082

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