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413.562.8730

# WOOD FLOORING INSTALLATION & MAINTENANCE





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## Wood Flooring Installation & Maintenance

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, or even weeks, it will acclimate properly and be ready to install.

In actuality, **wood floor acclimation has less to 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.**

Solid wood flooring will always perform best when the environment is controlled and remains within a relative humidity range of 30–50%. Engineered flooring performs best at 35–55% relative humidity. Temperature should also be controlled within a range of 60–80 degrees Fahrenheit.

Wood flooring is comprised of hygroscopic material that will change in dimension as a result of changes in relative humidity in the surrounding environment. When wood flooring 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 on page 5) coincides with the 6–9% 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.

"Solid wood flooring will always perform best when the environment is controlled and remains within a relative humidity range of 30–50%."

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*The guidance provided here is true for all types of wood flooring without exception—solid site-finished, solid pre-finished, engineered site-finished and engineered pre-finished. It is the obligation of the recipient, whether a contractor, job-site manager, installer, finisher or the homeowner to follow the guidelines established within this manual. Failure to do so will void any warranty whether implied or explicit. Ponders Hollow recommends that each party involved in the process of deciding, receiving, installing, finishing and ultimately the homeowner who must maintain the environment going forward, receives a copy of this guide. It can be readily downloaded from the Ponders Hollow website, [PondersHollow.com](http://PondersHollow.com).*

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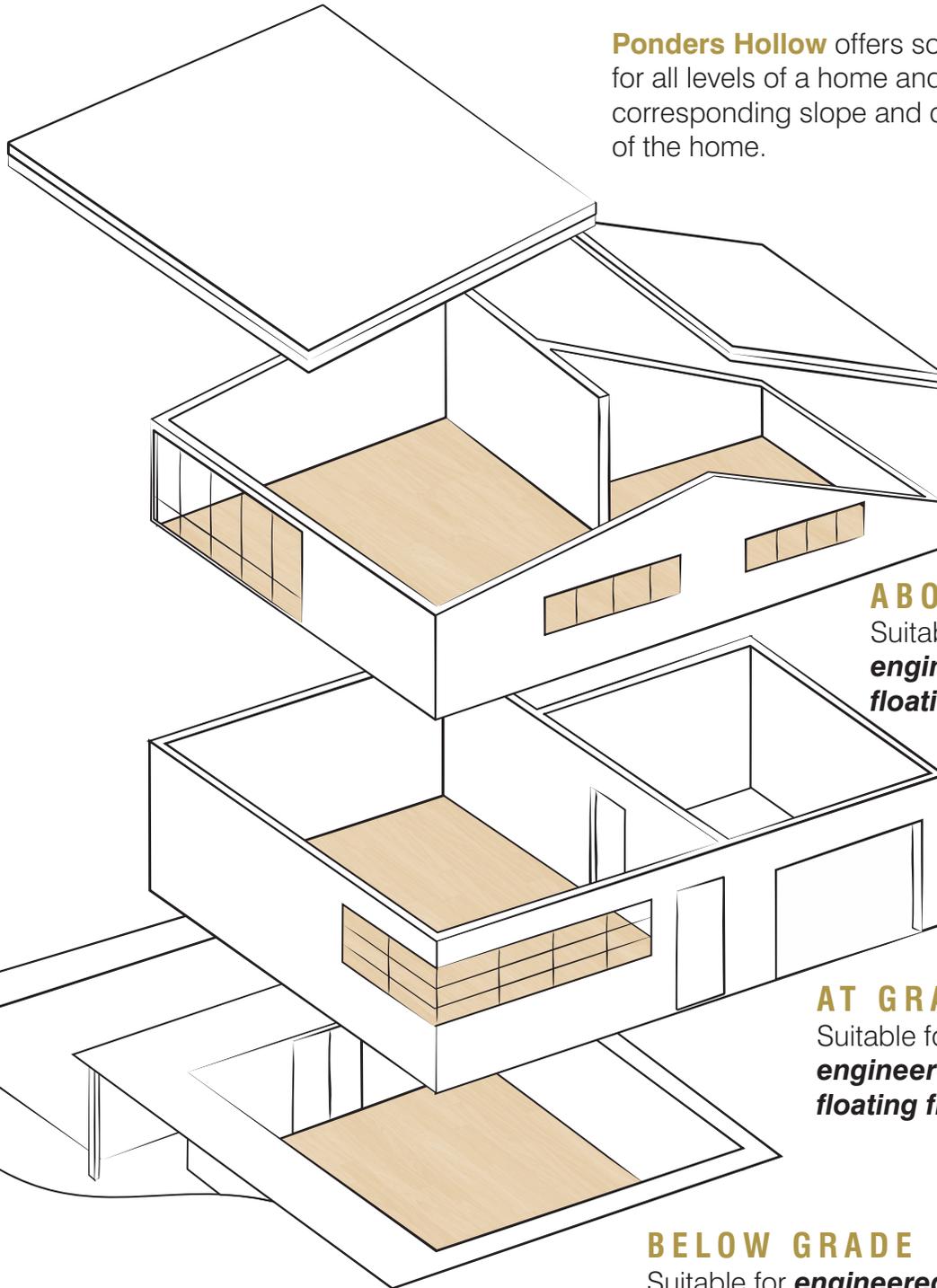


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**Ponders Hollow** offers solutions for all levels of a home and the corresponding slope and drainage of the home.



## ABOVE GRADE

Suitable for **solid, engineered and floating floors**

## AT GRADE

Suitable for **solid, engineered and floating floors**

## BELOW GRADE

Suitable for **engineered and floating floors**

**Moisture Content of Wood  
At Various Temperatures and Relative Humidity Readings**

Temperature

<b>30</b>	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
<b>40</b>	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
<b>50</b>	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
<b>60</b>	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
<b>70</b>	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
<b>80</b>	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
<b>90</b>	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
<b>100</b>	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
	<b>5</b>	<b>10</b>	<b>15</b>	<b>20</b>	<b>25</b>	<b>30</b>	<b>35</b>	<b>40</b>	<b>45</b>	<b>50</b>	<b>55</b>	<b>60</b>	<b>65</b>	<b>70</b>	<b>75</b>	<b>80</b>	<b>95</b>	<b>90</b>

Relative Humidity (Percent)

Forest Products Laboratory, U.S. Department of Agriculture

**Let's look at an example:** At 70° Fahrenheit, a relative humidity of 25% gives an EMC of 5.4%; and a relative humidity of 75% gives an EMC of 14.4%. 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" for a 2 1/4" inch board. That's one full inch over 16 boards in a floor. **Over the width of a 10' wide floor, that amounts to more than 3" 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.**

### Step 1

1. The building is completely enclosed (doors and windows installed).
2. Final grading has been completed and all drainage runs away from the building. **Ponders Hollow offers solutions for all levels of a home and the corresponding slope and drainage of the home.**
3. All wet construction elements are completed and dry (concrete, plaster, drywall, tile work, laminates, priming and painting). Don't let painters over-spray onto the sub-floors. Make sure tile wet work is contained so water is not allowed onto the sub-floor.
4. Basement and crawl space areas are dry, with dehumidifiers at the ready during the wet seasons.
5. Air conditioning and or heating systems are functional and have been running for at least 5 days prior to delivery. Introduce humidification if required.
6. There are costs associated with this preparation, and the future owner should understand that the cost to re-install far eclipses the cost of setting up a proper environment in the first place.
7. When appropriate humidity (minimum of 30% to a maximum of 50% for solid wood flooring and 35–55% for engineered wood flooring) and temperature inside building (60–80 degrees) has been achieved, step 1 of the environmental aspect has been achieved.



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## Step 2

8. When the relative humidity and temperature have been stabilized, and the flooring and sub-floor moisture content is within 1–1½% of each other, the environment is then technically sound to proceed with the installation.

## Step 3

9. Do not proceed with installation until both step 1 and step 2 of the environmental aspect have been achieved. It is entirely conceivable that the temperature and relative humidity have been achieved, yet the moisture content of the sub-floor could be several percentage points greater than the flooring. A proper installation will result when the moisture content in the sub-floor is driven lower. If the moisture in the sub-floor remains consistent, there is a high probability that the problem is originating from below. If so, steps must be taken to remedy this.
10. Crawl spaces and basements must be dry. A crawl space must be at a minimum 18" from the underside of the joists. Dirt floor crawl spaces must be covered 100% with a black polyethylene that is at a minimum 6 mil or equivalent Class C puncture-resistant membrane meeting ASTM D1745. Polyethylene must go up the walls of the crawl space and be secured.

**Time on the Job Site:** Most recommendations state that 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. Take necessary moisture readings to indicate when the materials have reached the proper moisture content. Notice 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 sub-floor throughout the entire installation area and record the readings. Create a grid and record the readings. Do a second reading 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 MVP4 in the basement or a similar product from another reputable vendor. If the slab is heated and/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.
- The floor must be **level**. Level is defined as being 3/16" within a 10' radius and or 1/8" within 6'. It is the *responsibility of the contractor* to turn over a sub-floor that meets the necessary standards including no creaking, flat seams, no raised corners and at a proper moisture content.

- It is critical that the sub-floor is clean and void of dirt, dust, plaster, etc. Sweeping alone is insufficient and will increase the likelihood of adhesive failure. **Always vacuum**. 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.
- **Leave a gap** of  $\frac{5}{8}$ " to  $\frac{3}{4}$ " between the flooring and any wall. The width of the gap depends on the depth of the baseboard, to allow for expansion. Ponders Hollow recommends a baseboard minimum of  $\frac{3}{4}$ ".
- **Screw down** sub-floor to eliminate squeaks. Nails and ring nails will not hold over time.
- **Sub-floors** should be a minimum of  $\frac{3}{4}$ " and should not consist of particle board. AdvanTech or similar products are highly recommended.
- Do not install over linoleum or levelers. Get down to a **clean sub-floor**. Leveling should take place under the existing sub-floor or be built up above using wood products, not trowel-on solutions.
- For flooring that is 4" or less, use a product like Fortifiber Aquabar B that also serves as a true **moisture vapor retardant** and helps minimize any squeaking that may occur. Never use Red Rosin Paper, which has no moisture barriers and rips 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 restrict it.
- **Spread** nails and or staples no farther than 6–8" apart; and when using wider widths (5" and wider), spread nails and staples no more than 6" apart. Never nail at less than 3" from the end of a plank. Ponders Hollow recommends 2" fasteners (nails or crown staples) for securing the flooring to the sub-floor. Always confirm the presence of radiant heat running on the underside and, if present, contact the manufacturer for a recommended fastener length.



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## MAINTENANCE RECOMMENDATIONS

Relative humidity and temperature control must be maintained year round within the grid provided by the Forest Products Laboratory, U.S. Department of Agriculture and shown earlier in this manual.

Sunlight may/will cause changes in color as the wood matures in place. Area rugs will slow the color changes, which can be remedied by moving the rugs periodically.

Liquid spills need to be wiped dry as soon as possible. Consider placing a larger pet mat under food and water bowls and an area rug by the kitchen sink.

Abrasives such as dirt, sand and cat litter will damage a hardwood floor regardless of the strength of the finish. Use entrance mats and area rugs where shoe-based traffic is heaviest. These should be vacuumed regularly. In wet weather they need to be hung to dry; consider rotating with a backup area rug. Give them a good shake periodically. All rugs should have a soft underside; otherwise use with a pad.

Felt pads should be applied under all furniture legs. They should be cleaned periodically and replaced annually. When moving furniture, always have enough hands to safely pickup and carry to a designated location—never slide across the floor.

Maintain your pet's nails on a regular basis. Most veterinarians can do the clipping in minutes.

Never wear high heels on a wood floor—the weight bearing point has the equivalent of thousands of pounds of pressure. High heels will damage all wood flooring.

If you need to move an appliance, get enough ¼" lauan to place on the floor. Lift the front of the appliance and slide under front feet or rollers, then pull the appliance out, making sure it is entirely on the lauan—not the floor.

We recommend that you regularly (3 times a week) sweep, dry mop and vacuum your hardwood floors. You may further clean with cleaning products and mops from Bona, which are sold at most Lowe's and Home Depot stores. They are also ideal for spot cleaning with a soft terrycloth towel. They will leave your floors clean and free from grime buildup. Don't over-apply cleaners.

Never ever use household detergents or cleaners on your floors. They will damage the finish and luster. Never wash or steam vacuum your hardwood floors. Never wash with products like Murphy's Oil Soap. Never buff or apply wax to the floor.

When in doubt on any of the content within the manual, please contact Ponders Hollow directly. We will work with you to help you arrive at a positive outcome.



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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16 Ponders Hollow Road, PO Box 579, Westfield, MA 01086