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413.562.8730

# WOOD FLOORING INSTALLATION & MAINTENANCE





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*Custom Wood Flooring & Millwork*

## 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 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. For optimal acclimation of solid wood flooring, cross stack flooring in layers using  $\frac{3}{4}$ ”–1” spacers to allow for air flow.

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 not true for all types of wood flooring without exception. It is the obligation of the recipient, whether a contractor, job-site manager, installer, finisher or the end user 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 end user 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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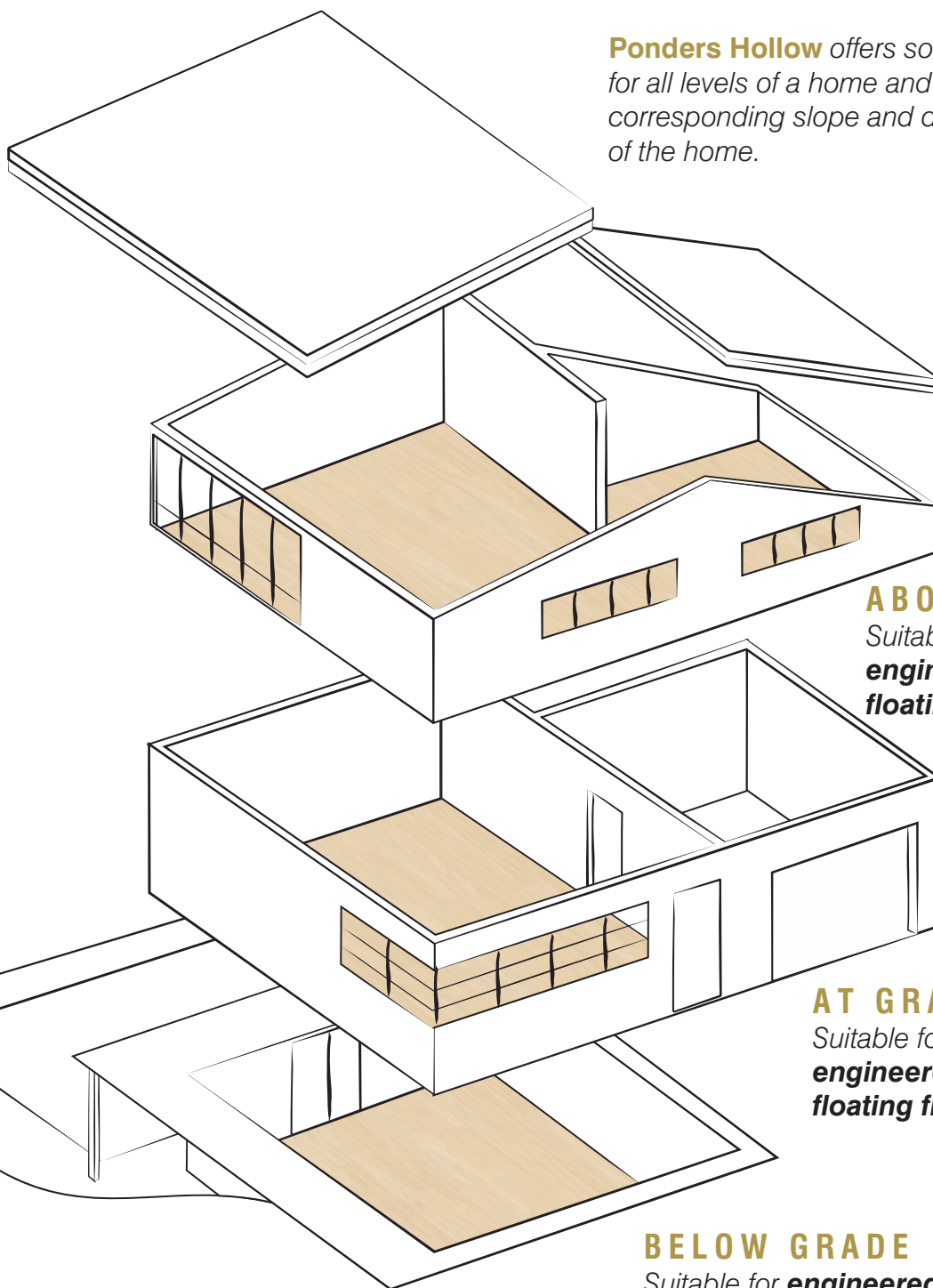


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**Ponders Hollow** offers solutions for all levels of a home and the corresponding slope and drainage of the home.



## 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

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	95	90

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

**Let's look at an example:** At 70 degrees 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  $\frac{1}{16}$ " for a  $2\frac{1}{4}$ " 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.**



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## JOB SITE PREPARATION

Ensure that the job site conditions are ready for the wood flooring. The following conditions should always be established **before the wood is delivered**. There are costs associated with this preparation, and the builder, installer, and end user should understand that the cost to re-install eclipses the cost of setting up a proper environment in the first place.

- The envelope of the building should be completely enclosed (windows and doors installed and operational).
- Final grading has been completed and all drainage runs away from the building.
- All wet construction elements are completed and dry (concrete, plaster, drywall, tile work, laminates, priming and painting). Use caution that painters do not overspray onto the subfloor and tile work is contained so that water is not allowed on the subfloor.
- Crawl spaces must be dry and protected from ground moisture. A crawl space must be maintained minimum 18" from the underside of the joists to the earth, and a minimum of 12" from the earth to the underside of the beams. When enclosed, they should be either properly vented or conditioned, and covered with a minimum 6-mil polyethylene vapor retarder, as outlined in the NWFA Installation Guidelines.

*\*For more information on the crawl space preparation, and the different types of crawl spaces, please refer to the most recent revision of the NWFA guidelines by visiting [nwfa.org](http://nwfa.org) or calling 800-422-4556.*

- Heating and air conditioning systems (HVAC) must be functioning properly and running for a minimum of 5 days prior to delivery of the flooring. Introduce humidification if required. Proper conditions for solid wood flooring are 30–50% relative humidity and 60–80 degrees Fahrenheit, and 35–55% relative humidity and 60–80 degrees Fahrenheit for engineered wood flooring.
- Subfloors should be screwed down to eliminate squeaks.
- Subfloors should be a minimum of ¾" thick and should not consist of particle board. AdvanTech or similar products are highly recommended. Linoleum or levelers are not recommended. It is the responsibility of the flooring contractor and/or building contractor to ensure a subfloor meets the necessary standards, and flooring assemblies (joists/floor truss spacing and panel thickness) must be designed and constructed to accommodate design loads and the floor covering being installed over it. This includes no creaking, flat seams, no raised corners and proper moisture content.
- The floor must be level. Level is defined as being 3/16" within a 10' radius and 1/8" within 6'.
- Check with your pin-type meter manufacturer on calibration of your meter based on your subfloor material and selected flooring species. After calibrating your pin-type meter to the subfloor material being tested, take MC readings in a minimum of 20 test locations for up to the first 1,000 square feet, and four readings per 100 square feet thereafter. Elevated readings should be isolated and addressed prior to delivery and installation of the flooring. Record all readings.
- When temperature and humidity have been stabilized, and your subfloor moisture content coincides with the wood flooring requirements you have selected, you may proceed with delivery and acclimation of the wood flooring.
- Never store flooring in a basement, garage or directly on concrete.
- Solid wood flooring should not be installed below grade. For below-grade applications, use engineered wood flooring designed and warranted for that purpose.



**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.*



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## INSTALLATION RECOMMENDATIONS

*Please request our Engineered Flooring Installation Guidelines for more information on acclimation and specific installation instructions for engineered flooring, including concrete subfloor prep and radiant heat applications. This can be requested by calling 413-562-8730 or emailing your sales representative directly.*

- 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 when used. Always vacuum.*
- Recheck the moisture of your subfloor. Take MC readings in a minimum of 20 test locations for up to the first 1,000 square feet, and four readings per 100 square feet thereafter. Elevated readings should be isolated and addressed prior to delivery and installation of the flooring. Record all readings.*
- Calibrate your pin-type meter based on your selected flooring species. Take MC readings on the back of minimum 40 flooring boards for the first 1,000 square feet, and an additional four readings per 100 square feet thereafter. Record all readings.*
- Before installation, confirm that the moisture content of the wood flooring and subfloor are within acceptable tolerances. For flooring less than 3" wide, the difference should not exceed 4%; for flooring equal to or greater than 3", it should not exceed 2%. Acclimation should continue until moisture readings stabilize with jobsite conditions. Record and retain all readings for job documentation.*



- We recommend using a Class II liquid-applied vapor retarder from a reputable manufacturer like Wakol or Bona over any properly constructed and dry unconditioned space. Follow all manufacturer instructions for use. Some all-in-one trowel-down adhesives also contain vapor-retarder properties; check with your product manufacturer for jobsite-specific guidance, including product compatibility. A vapor retarder is intended to control normal vapor transmission, not to correct existing moisture problems. For narrow-plank wood flooring using a nail-down-only installation method, you may alternatively use a Class II sheet-good vapor retarder such as Fortifiber Aquabar B. Rosin paper is not recommended.
- Generally, it's recommended to run your flooring perpendicular to the floor joists for better structural stability.
- For planks 5" and wider, use a glue-assist method in addition to mechanical fastening. Apply an appropriate elastomeric wood-flooring adhesive per manufacturer instructions from a reputable manufacturer like Wakol, Bona or Bostik. This combination of fastening and adhesive improves stability and minimizes movement in wider planks.
- For ¾" solid wood flooring, use 15.5g staples or 16–18g cleats at least 1-1/2" long. The recommended fastener spacing is 6–8" intervals along the length of each board, and 1–3" minimum from each end-joint of every board. It is recommended to use minimum 2 fasteners per board on very short pieces.
- Leave an expansion gap equal to the flooring thickness between the flooring and any wall. Never run flooring all the way to the wall. Your baseboard should cover this gap from above, and never be installed into the gap.





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## MAINTENANCE RECOMMENDATIONS

*It is the end user's responsibility to maintain relative humidity and temperature control year-round within the grid provided by the Forest Products Laboratory, U.S. Department of Agriculture (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.*

*If you need to move an appliance, get enough 1/4" 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 (three 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 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 content covered within this manual or that is not covered in this manual, please contact Ponders Hollow directly, or refer to the most recent revision of the National Wood Flooring Association Guidelines by visiting [nwfa.org](http://nwfa.org) or calling 800-422-4556. All building codes should be followed in accordance with your local area*



*For suppliers of the fine  
products referenced, contact:*

**Leese Flooring Supplies**  
63 Sanrico Drive  
Manchester, CT 06042  
860.649.7627



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