

# **WOOD FLOORING** INTERNATIONAL **STOP!**

Wood and Bamboo are natural products, containing variations in color, decoration and grain. Before any Wood Flooring International flooring product leaves our plant, it goes through numerous inspections; as the installer of the flooring YOU are the final inspector. Allow five (5) per cent minimum for culling out (removing) undesirable pieces during the layout process. Some overwood/underwood and gaps are a natural occurrence in factory finished wood flooring. Small gaps can be filled with appropriate color match filler. All wood floor installations must follow NWFA (National Wood Flooring Association) guidelines. **DO NOT GLUE DOWN SOLID RANDOM LENGTH WOOD FLOORING. SOLID WOOD FLOORING MUST BE NAILED OR STAPLED DOWN OVER AN APPROPRIATE WOOD SUB-FLOOR AS PER NWFA GUIDELINES.**

Solid wood shorts and or parquets may be glued down using a waterless adhesive (urethane, polymer or solvent base). All solid wood flooring requires acclimation time **BEFORE** it is installed. Check the moisture content (MC) of the flooring when it is delivered to the job site, and do not install until it reaches the desired MC for the climate and environment in which it is going to be used; adjusted to the species of wood being installed. For more information about the MC required in your area for the species of wood you are using call our technical department or contact the National Wood Flooring Association. Note: solid wood will not properly acclimate in wrappers/cartons, etc. Remove the flooring from its packaging, cross stack it on the job site and do not install until it is at the correct MC.

***WOOD DUST CAN BE AN IRRITANT TO BOTH SKIN AND LUNGS! BE SURE TO WEAR THE PROPER PROTECTIVE GEAR WHEN CUTTING OR SANDING WOOD.***

**NOTE: WFI ACCEPTS NO RESPONSIBILITY OR LIABILITY FOR ANY MATERIAL ONCE IT HAS BEEN INSTALLED. IF THERE IS ANY QUESTION REGARDING FIT, FINISH OR ANY OBVIOUS DEFECTS; DO NOT INSTALL! INSTALLATION ACKNOWLEDGES ACCEPTANCE OF THE MATERIAL.**

**INSTALLER: LEAVE THIS NOTICE WITH CONSUMER.**



# WOOD FLOORING INTERNATIONAL

## SOLID WOOD & BAMBOO FLOORING INSTALLATION

The following information is aimed at the wood floor installer, whose focus is producing the finest finished product possible. The installer may in some cases be the person who sold the job, the homeowner or in many instances the job was sold by someone else. Good communication between the sales person and the installer is important. Customer expectations should always be considered when both selling and installing both pre-finished and job site finished wood floors. If a factory finished floor is “oversold” and things such as over-wood, under-wood, or small gaps are not discussed, the job becomes an accident waiting for a place to happen. The same is true of jobsite finished wood floors if color change over time and differences in color between different finish systems is not discussed and understood. When selling wood or Bamboo flooring take into consideration the lifestyle of the customer; do they have pets, small children, do they entertain frequently? If so do not recommend flooring that is prone to dent or mar such as American Cherry, American Walnut, Bamboo (especially carbonized) Pine or Genuine Teak. Recommend woods on the high end of the Janka Hardness scale in these situations. The bottom line is good communication between all parties.

**Before starting any wood floor installation make sure that the job site conditions are correct! It is the installer/owners responsibility to ensure that the jobsite conditions and jobsite sub-floor are structurally and environmentally correct before any wood flooring is installed. Wood Flooring International declines any responsibility for failures or deficiencies of hardwood flooring resulting from or related to sub-floor or job site conditions. Permanent HVAC should be on and operational a minimum of seven days and maintained between 65 and 75 degrees Fahrenheit. The relative humidity must be maintained between 30 and 50 per cent before delivery, during and after installation. If HVAC is not possible at the time of installation, the job site conditions must be at or near normal living conditions between 60 and 80 degrees Fahrenheit, and at the average yearly relative humidity for the area. All wet work must be completed before wood floor installation begins, i.e. painting, drywall mud, ceramic installation/grouting etc.**

All solid wood flooring must be acclimated to the environment in which it is going to be used. Check for the required Moisture Content requirement for your geographical area before installing. The moisture content of the sub floor must be within 4% of the finish floor for all strip flooring, and 2% for Plank flooring (any flooring 4” or wider). Acclimation is not a matter of time, but of environment and species as well as weather or not the flooring is factory or job site finished. **Pre-finished solid wood flooring will not acclimate properly if left in cartons. This is true of solid bamboo, palm as well as other solid wood related flooring products.** Remove the flooring from cartons and cross stack (Lincoln Log fashion) on 2 X 4’s or dry plywood. Do not stack on concrete. Check the MC (moisture content) when the material is delivered to the job site and **DO NOT INSTALL UNTIL THE WOOD HAS REACHED THE PROPER MC FOR THE ENVIRONMENT IN WHICH IT IS GOING TO BE USED; ADJUST ALL MC READINGS FOR THE SPECIES YOU ARE INSTALLING.** Remember, the denser the species of wood the longer it will take to acclimate, and pre-finished flooring takes longer than un-finished flooring to acclimate. Document all moisture readings

and have the document signed by all interested parties. Writing the moisture readings on the sub floor in a place that would be accessible in the future is also a good idea. Do not truck or unload wood in rain, snow or other excessively humid conditions. Cover it with a tarpaulin or vinyl sheeting if transporting in fog or very moist conditions.

## FLOOR PREPARATION

A. Concrete, prepping for sub floor installation.

1. MAKE SURE IT IS FLAT. Make sure the concrete slab is flat to manufactures specification, i.e. 1/8" in a 6 foot radius or 3/16" in ten foot radius. If the slab is out of specification, consider grinding, floating or both. Many high spots can be removed by grinding, depressions can be filled with various patching compounds, and very bad or rough slabs can be fixed using a good self-leveling concrete product such as Ardex K-15, or equal.
2. MAKE SURE IT IS DRY. The current specification for a dry slab measured using a calcium chloride test is 3 pounds per 1000 sq. ft. or less.
  - a. Concrete moisture meters will show you if the slab is dry enough to install wood. Remember that a meter will only give a go, or no go. Slabs with high meter readings should be checked further using a calcium chloride test.
  - b. Another method for testing a slab is the plastic or rubber mat test. Tape a piece of plastic approximately 2 X 2 to the slab for 24 hours remove and check for moisture accumulation; if there is obvious water under the matt **STOP** and do a calcium chloride test. If a slab tests too high in vapor emission to install a plywood sub floor by normal means, (higher than 12 pounds), consider using a floating plywood sub-floor.

## II. SUB FLOOR INSTALLATION METHODS OVER CONCRETE ON GRADE

1. 3/4" CDX plywood is recommended (5/8" minimum) install 6 mil plastic sheeting over the concrete making sure that all seams are overlapped a least 18 inches. Run the plastic up the walls and cut the excess off after the plywood is installed. Lay the 4 X 8 sheets of plywood in a staggered brick pattern by cutting the fist sheet to 4 X 4 and fasten using one of the following methods.
  - a. Aerosmith gun using 1-1/2" pins shoot pins starting from the center of the sheet of plywood. Use enough pins to insure that the plywood is flat and sound; nine pins minimum to 32 pins maximum.
  - b. Hammer driven concrete nails.
  - c. Tapcons
  - d. Shot pins such as Hilti
  - e. Leave 1/4" to 1/2" spacing between each sheet of plywood
  - f. Leave 3/4" expansion around the floor with the exception of areas where there will be no trim such as door jambs, here 1/8" expansion is adequate.
  - g. Do not use t & g plywood
  - h. Nail or staple finish flooring using 1-1/2" cleats or staples.

NOTE: If plywood over concrete system is being installed in an area with heavy expected annual rainfall, apply asphalt mastic on the concrete using a small notch trowel let dry about one hour and then install plastic. Walk in or roll the plastic to insure a bond. Don't worry about small air

bubbles, captive air can be let out by puncturing the bubbles. Another method is: install two layers of 30 pound asphalt felt paper both laid in asphalt mastic. Lay second layer at 90 degrees to the first, then shoot plywood down. Flooring grade OSB may be used instead of plywood. Use 3/4" OSB and install with sealed side down.

2. Floating sub floor:

- a. Install two layers of 3/8" CDX plywood over either 6 mill poly film or a closed cell foam sound barrier such as Volare foam. Lay the first layer of plywood over the sound/vapor barrier, and then install the second layer at 90 degrees to the first layer. Staple the layers together using 5/8" 18 gauge staples. A two in one underlayment (sound/vapor barrier) may be used.

NOTE: The floating sub floor system can be used to install nail down wood floors over existing flat sound sub floors such as tile, stone or commercial carpet. Floating sub floors can be used on grade, above and below grade. Nail or staple over this system using 1-1/2" cleats or staples.

Plywood sub-floors over joists

1. As with all sub floors this system must be flat to within 3/16" in a ten foot radius or 1/8" in a six foot radius.
2. Check for loose plywood and re-nail or screw down securely, check for expansion between sheets of plywood (1/8") and address, as needed using a circular saw. If the seams are too tight the sub-floors will squeak. Use minimum of 5/8" plywood.
3. Check for delaminated areas and repair as needed.
4. As with all sub-floors, make sure the plywood is free of debris, paint drywall compound etc.
5. Install wood flooring perpendicular to joists.

**I. SCREEDS SYSTEM**

This system uses as a nailing base flat, dry 2" X 4" screeds of Group 1 density wood (sometimes called sleepers) of random lengths from 18" to 48". They must be preservative treated with a product suitable for interior installation. After treatment screeds must be dried to a Moisture Content of 12% or less, if saturation with water is involved. Screeds are laid on their flat face in rivers of mastic with screed runs 12" on center at right angles to the direction of the finished floor.

Sweep the slab clean, prime with an asphalt primer and allow it to dry. Apply hot (poured) or cold (cut back) asphalt mastic and imbed the screeds. Stagger joints and lap ends at least 4" and leave 1/2" space between lapped edges. Be sure there is enough mastic for 100% contact between screeds and slab. Leave 3/4" space between ends of screeds and walls with a continuous run of screeds at end walls.

Over the screeds lay a 4 to 6 mil plastic vapor retarder with edges lapped over the rows of screeds. Avoid bunching or puncturing it, especially between screeds. The finish flooring will be nailed to the screeds through the film.

The system with screeds spaced 12" on center and a moisture retarder without a sub floor is satisfactory for all 3/4" strip flooring and Plank Flooring less than 4" wide. Plank Flooring 4" and wider requires a plywood-on-slab sub floor, or screeds plus a wood sub floor, to provide an adequate nailing surface. The sub floor over screeds may be 5/8" or thicker plywood, 3/4" OSB (performance rated), or 3/4" Group 1 dense softwood boards

or equivalent no wider than 6". If sub floor boards are used over sleepers, or screeds, allow 1/2" spacing between boards. <sup>1</sup>

***Undercut all door trim and casings as part of the floor preparation process.***

### III. LAYOUT

The layout of any flooring product is a matter of esthetics. What the customer considers the right look for their room or rooms. The size and pattern of the flooring is a major determining factor. In any case the layout is determined by first squaring the room or rooms. If the flooring is going to continue throughout in a contiguous flow, then the job has to be laid out on a grid to insure that the floor is as uniform as possible:

1. First determine a starting area, find the center of the room and strike a line.

2. Now layout a perpendicular line to the first line. Once you have an intersection in what should be the center of the room, you measure three (3) feet out on one line and four (4) feet out on the perpendicular line.

3. Now measure the distance from the four-foot mark to the three-foot mark. This measurement should be exactly five (5) feet. If it is off, check which line you need to adjust and make the changes then check the 3, 4, 5, again.

These lines will give you a starting point not only for that room but also for the entire job. Extending the starting lines and snapping lines through the installation will give you a visual or how the installation will proceed, and allow you to make adjustments in other rooms as to out of square walls, going around islands etc. Remember to always include your customer in the lay out process, so there are no surprises as the job progresses.

All patterns or decorative floors should be built from the inside of the room out using the junction of the working line and the perpendicular line. Lay the flooring in a random pattern; avoid stair step patterns, H joints, and make sure all end matches are separated by at least 6 inches whenever possible. A good rule of thumb is to try and keep end match joints separated by two times the width of the flooring being installed: 6" for 3" wide material, 10" for 5" wide material etc.

Parquet patterns should be laid out leaving any cut in areas around the room as even as possible. Start in the center of the room working in a pyramid pattern and finishing with the cut pieces the same size on parallel walls.

Herringbone patterns should be installed by breaking the room down into quadrants. Lay out the pattern and discuss with the customer which direction the "arrows" should face. What looks like a herringbone to some, looks like a zigzag to others.

Strip and plank should be laid out to avoid leaving very small cut in pieces at wall lines, or ending up with boards that are three inches one end and one inch at the other.

Consider using a diagonal layout in smaller rooms or in installation where the walls are obviously out of square. Remember to add a higher waste factor for diagonal layouts.

Trammel points are a good way to find a perpendicular line to your working line. Just remember that the first line must be true, because the perpendicular line will be square to your line, not necessarily to the walls. If the wood floor is being installed in more than one area, snap grid lines throughout the area to insure that the flooring will not run off in other rooms and will meet around "islands".

***The lay out process is a great time to suggest adding a decorative border, apron or medallion to the installation.***

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<sup>1</sup> This section provided by NOFMA INSTALLATION MANUAL #9

## II. INSTALLATION

Always use extra care not to scratch or ding the face when installing pre-finished wood flooring. Keep tools off the finished areas, cover your nailer with blue tape in areas that make contact with wood surface and keep the work area clean and free of debris. Use the proper mallet heads as not to damage the finish as you are tapping the floor together. Keep a piece of cardboard or clean carpet to keep tools on and off of the wood. Undercut doorjambs as part of the preparation process.

1. Cover the sub floor with 15 pound asphalt felt paper or equivalent. Tack the felt in place to insure your working lines will not be disturbed. Only lay as much felt paper as you will be covering with the rack you intend to work with. Rack out the flooring with attention to proper spacing of end joints, eliminating stair stepping, and H joints, leaving  $\frac{3}{4}$ " expansion space at starting wall line. Face nail the first row with the tongue away from the wall and begin blind nailing through the tongue either by hand or using a pneumatic nail gun that shoots 15 gage nails, until your flooring nailer will work without damaging walls. Nail the flooring every 8" with an additional fastener as close to each end match as possible. When nailing over joists nail one fastener into each joist and one between each joist using 2" cleats or staples. Work from left to right nailing the rack out and then down the length of the room. Continue this process until the nailer is too close to the wall to use. End pieces can be cut to within  $\frac{1}{2}$ " of wall lines. Finish nailing the floor using face nails placed approximately  $\frac{3}{8}$ " from the edge of the boards. Set all face nails well, and if factory finished fill same with color match putty. In brittle species of flooring pre-drill all holes prior to face nailing. An alternative to face nailing is the use of an adhesive along the starting and finishing wall lines that is recommended for solid wood and DOES NOT CONTAIN WATER; such as Bostik Best, Stauf Solva-Mastic etc. Use a  $\frac{1}{4}$ " X  $\frac{1}{4}$ " notch trowel to spread the adhesive, install the flooring avoiding the use of long boards. Use wall wedges or Powernail's Powerjack to hold the flooring in place until the adhesive dries. NOTE: Only use the recommended adhesives as they are electrometric and will not prevent the natural movement of the floor system. Do not use carpenters, or wood workers glue! In large rooms or when installing wide plank flooring, start the installation in the center of the room using a backer board, then using a spline (slip tongue) nail the floor in opposite directions. Nail several rows, remove the backer boards, install spline using Titebond II and nail same, then continue installing in two directions. This method can save a lot of time as two crews can work in the same room. All solid wood flooring expands to the tongue side; this method of installation will insure that 50% of the natural movement of the flooring will go in one direction and 50% in the other.
2. WFI recommends the Powernail Model 50P or 50M nailer with the appropriate barbed cleat set up per the profile of the flooring being installed;  $\frac{9}{16}$ ",  $\frac{5}{8}$   $\frac{1}{2}$ " etc. This machine comes with different foot adapters for all engineered and solid profiles less than  $\frac{3}{4}$ " thick and if used properly will not cause face dimpling or damage the flooring. If nailing  $\frac{3}{4}$ " flooring you can use any of the manual or pneumatic professional floor nailers on the market such as: Stanley Bostich MIIIFS, MIIIFN, Powernail Model 45 or Model

445. NOTE: Wood floor cleats work best with brittle species of wood such as Cumaru and Australian Cypress.

## **THE FOLLOWING PERTAINS TO INSTALLING OVER RADIANT HEAT ONLY:**

**NAIL DOWN FLOORS MAY BE INSTALLED OVER RADIANT HEAT; ALL INSTALLATION GUIDELINES MUST BE FOLLOWED. ANY DEVIATION FROM THE PROPER PROTOCOLS WILL VOID ALL WARRANTIES. NOTE: IF NEW CONSTRUCTION NOTIFY YOUR BUILDER THAT WOOD FLOORING IS BEING INSTALLED AS RADIANT HEATING SYSTEMS CAN BE DESIGNED EXPRESSLY FOR WOOD FLOORING APPLICATIONS. IF REMODELING EXISTING STRUCTURE, CHECK TO MAKE SURE THE SYSTEM IS COMPATIBLE WITH WOOD FLOORING. DO NOT INSTALL WOOD FLOORING WIDER THAN 3" OVER RADIANT HEAT! DO NOT INSTALL CUMARU, IPE, OR LAPACHO OVER RADIANT HEAT! CHECK THE STABILITY FOR TANGENTIAL SHRINKAGE/GROWTH OF THE SPECIES OF WOOD YOU ARE USING BEFORE ATTEMPTING TO INSTALL IT OVER RADIANT HEAT!<sup>2</sup>**

- Prior to installation moisture testing must be conducted and documented per ASTM test method 1869-89 (calcium chloride) for concrete or wood moisture meter for wood sub floors.
- The moisture content for concrete sub floors (containing a radiant heat system) registered after a calcium chloride test must not be greater than 2 pounds per 1000 square feet of area. If testing exceeds these limits, DO NOT INSTALL FLOORING.
- Relative humidity of the jobsite must be maintained between 35-55% rh. The use of a humidifier may be required to maintain the proper humidity levels. Failure to maintain proper humidity level can result in excessive drying of the flooring and will void all manufactures warranties.
- Use of an in floor temperature sensor as well as a separate thermostat for individual rooms is required.
- An outdoor temperature sensor should be used to adjust water temperature according to anticipated heat loss.
- Operation of radiant heat system should be set to run at 2/3 maximum output for a minimum of two weeks prior to installation of flooring. This will insure that any residual moisture in the sub-floor has dissipated.
- Prior to installation reduce the heat to 65 degrees F. for at least four days
- Install flooring as per WFI floating system guidelines.

**JOBSITE REQUIREMENTS FOR RADIANT HEAT WOOD FLOOR INSTALLATIONS. PRIOR TO THE INSTALLATION THE RADIANT SYSTEM MUST BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.**

- Moisture content of concrete must not exceed 2 pounds per 1000 square feet of area per calcium chloride test (ASTM 1869-89). Wood sub floors can not exceed 13% and must be within 4% of the wood flooring.
- Concrete must be allowed to cure and dry a minimum of four weeks before operation of radiant heat system

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<sup>2</sup> This information is available by calling WFI or the NWFA.

- The radiant heat system should be set to run at 2/3 maximum output for a minimum of two weeks prior to install of flooring to further allow moisture from the concrete to dissipate and reach a final moisture content. This must be done in both heating and non-heating seasons.
- Four days before installation reduce to a temperature of 65 degrees.
- Install the wood flooring according to WFI floating floor installation guidelines. The use of a two in one underlayment is required.
- 48 hours after completion of the installation, slowly raise the temperature of the heating system to it preferred operation level over a period of five days.

**ANY DEVIATION FROM THESE INSTRUCTIONS WILL VOID ALL MANUFACTURERS' WARRANTIES!**

## V. DECORATIVE PRE-FINISHED WOOD FLOORS

Installing inlays, borders, aprons and medallions in pre-finished floors is done exactly the same as in unfinished with the extra care given to not damaging the factory finish. All decorative floors are built from the inside out, so take extra care during the lay out process.

- A. Layout where your decorative work is going to be on the sub-floor and remember to leave these areas free of adhesive, cleats, nails or staples.
- B. When using a template to cut out around fieldwork or drop in a medallion, secure the template with double face tape or weights. Never nail a template to the pre-finished flooring. Cut out the field, then using a router cut a groove around the entire field using a bearing bit to match the size of the tongue being used. Install a spline (slip tongue) and nail same. Now install the boarder. It is a good idea to both glue and nail boarder work.
- C. When using a template to cut out around fieldwork or drop in a medallion, secure the template with double face tape or weights. Never nail a template to the pre-finished flooring.
- D. Tape the bottom of your saws and routers to prevent scratching the floor with their base.
- E. Always use a new sharp carbide blade or bit to cut. This will help eliminate splintering.
- F. Tape over the area you are cutting to prevent scratches and splintering.
- G. Do not let blades or bits get over heated. Take your time. If the blade or bit gets too hot it will splinter the edges or warp and make an inaccurate cut.
- H. Keep the work area **VERY** clean as debris will scratch the factory finish
- I. When installing "Hand Scrapped" wood floors, it is important to ease the edges of any cut pieces of flooring with a block and sandpaper before installing any butt transitions. Follow the contour of the scraping and if necessary recoat the edge with a clear finish. Matt clear nail polish works well. For stained floors use Minwax color match stain touch up "pencils" that contain stain, then re-coat edge. Do not use wax color pencils.

NOTE: If the floor you are installing is going to be job site finished follow these basic guidelines:

1. If stain is going to be used make several samples and have your customer sign off on the final selection. Show these samples in the room where the work is being done if possible as lighting is very important.

2. Explain what “patina” means and that the flooring will darken or amber over time. With exotics make up samples and expose them intense light to pre-patina the wood. Also, do samples in both oil, and water base finish to show the color difference expected. This is true of conversion varnish and moisture cured finish as well.
3. If no stain is being used make samples of what the color difference will be using different types of finish as above.
4. Have the customer sign off on sheen as well as color.

## **VI. CLEAN UP**

When working with any pure urethane adhesive, tape your trowel before spreading the adhesive leaving only the notches exposed. This tape “trick” works well with most adhesives. Simply remove the tape at the end of the day and all you have left to clean are the notches. Clean up any adhesive that may have gotten on the surface; and remember that removing dried urethane adhesive from a pre-finished floor is difficult to imposable. **Do not attempt to clean up pure urethane adhesive with water! Look at the floor as if you own it, because if it isn't right, you do!** Check for gaps and fill them with color match putty. Make sure all trim pieces and transitions look good and are fitted and installed properly. Provide your customer a wood floor care kit, and go over maintenance procedures with them.

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