

## Installation

### Installer / Owner Responsibility

Carefully inspect all materials before installation. Materials installed with visible defects are not covered under the warranty. Do not install if you are not satisfied with the flooring; contact your dealer immediately. Final quality checks and approval of the product is the sole responsibility of the owner and installer. Make sure you are installing the correct color; no claims will be accepted for color once the material is installed. The installer must determine that the job-site environment and sub-floor surfaces meet applicable construction and material industry standards. We decline any responsibility for job failure resulting from deficiencies caused by sub-floor or job-site environment or installation related items. All sub-floors must be clean, flat, dry and structurally sound.

### Basic Tools and Equipment

Broom or vacuum, moisture meter, chalk line & chalk, tapping block, tape measure, safety glasses, hand or electric saw, miter saw, 3M blue tape, hardwood floor cleaner, hammer, pry bar, color wood filler, straight edge, trowel.

### Putty and Filler Use

Please keep on hand like colored putty or filler as well as colored markers to touchup minor chips and nicks in the finished product. It is also advised to fill any allowable gaps before leaving jobsite

### Recommended Installation Methods

All of our products\* can be installed using the direct glue down method, the floating method and by the use of proper mechanical fasteners. However we recommend that the product be direct glued for the best installation for the following reasons;

- 1) Approved adhesives provide enhanced vapor emission protection
- 2) Approved adhesives can provide increased Sound Transmission Class (STC)
- 3) Approved Adhesives may help to increase Impact Isolation Class (IIC)
- 4) Approved adhesives stop squeaking, crackling and other noises due to loose or improperly placed fasteners.

### Handling and Storage

- Don't truck or unload wood flooring in the rain, snow or other humid conditions.
- Store wood flooring in an enclosed building that is well ventilated with weather proof windows. Garages and exterior patios, for example, are not appropriate for storing wood flooring.

### Job-site Conditions

Wood flooring should be one of the last jobs completed in a construction project. Prior to installing hardwood floors, the building must be structurally complete and enclosed, including installation of exterior doors and windows. All finished wall coverings and painting should be completed. Concrete, masonry, drywall, and paint must also be complete, allowing adequate drying time as to not raise moisture content within the building.

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- HVAC systems must be fully operational at least 7 days prior to flooring installation, maintaining a consistent room temperature between 65-85 degrees and relative humidity between 35-55%.
- Engineered hardwood floor may be installed above, on, and below grade level.
- It is essential that basements and crawl spaces are dry. Crawl spaces must be a minimum of 18" from the ground to underside of joists. A vapor barrier must be established in crawl spaces using 6 mil black polyethylene film with joints overlapped and taped.
- During the final pre-installation inspection, sub-floors must be checked for moisture content using the appropriate metering device for wood and/or concrete.
- Flatness required as follows- 3/16" in 10' or 1/8" in 6'. Floating floors requirements are more stringent. If the floor is to be glued down then fill low areas with the appropriate cementations sub-floor leveling compound. The leveling material should provide structural soundness for the flooring being installed. Structural soundness is the responsibility of the installer

### Acclimation Process

Wood flooring needs to reach a "moisture content equilibrium" with the surrounding environment where it will be installed. The process of reaching equilibrium is referred to as "acclimation". Proper acclimation ensures that the wood flooring has adjusted to the area where it will be installed before installation begins:

- Always store cartons on a flat, dry surface in the area where they will be installed.
- Do not open cartons until the day of installation and protect from moisture.
- Jobsite must have a consistent room temperature of 65° - 85° F.
- Jobsite must have relative humidity levels of 35%-55% before, during and after installation.
- WMC (Wood Moisture Content) must be within 4% of the wood subfloor before starting installation.
- Cross stack the cartons in the environment that they will be installed in. Acclimating material for as long as it takes to reach equilibrium. Work out of multiple cartons to mix material. Only opening cartons as you are ready to use them.

## Sub-floor Preparation

### Wood Sub-floors

- Sub-floor must be structurally sound and properly secured with nails or screws every 6 inches along joists to reduce the possibility of squeaking.
- Wood sub-floors must be dry and free of wax, paint, oil, and debris. Replace any water-damaged or delaminated sub-flooring or underlayments.
- Additional requirements for flatness are required for floating floors as stated in installation guidelines
  - **Preferred sub-floors** - 3/4" CDX Grade Plywood or 3/4" OSB PS Rated sub-floor/underlayment, sealed side down, with joist spacing of 19.2" or less; **Minimum sub-floors** - 5/8" CDX Grade Plywood subfloor/underlayment with joist spacing of no more than 16". If joist spacing is greater than 19.2" on center, add a second layer of sub-flooring material to bring the overall thickness to 1-1/8" for optimum floor performance. Hardwood flooring should be installed perpendicular to flooring joists. If flooring is installed parallel with joists then an additional layer of 1/2" plywood must be installed to meet minimum requirements of 1-1/8"
- **Sub-floor moisture check.** Measure the moisture content of both the sub-floor and the hardwood flooring with a pin moisture meter. Sub-floors should not exceed 12% moisture content. The moisture difference

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between subfloor and hardwood flooring should not exceed 4%. If sub-floors exceed this amount, an effort should be made to locate and eliminate the source of moisture before further installation.

- Do not nail or staple over particle board or similar product.

### Concrete Sub-floors

- Concrete slabs must be of high compressive strength with minimum 3,000 psi. In addition, concrete sub-floors must be dry, smooth and free of wax, paint, oil, grease, dirt, non-compatible sealers and drywall compound etc.
- Engineered hardwood flooring may be installed on, above, and/or below-grade.
- Concrete substrates must meet or exceed adhesive manufacturers guidelines for flatness
- Additional requirements for flatness are required for floating floors as stated in installation guidelines
  - Lightweight concrete that has a dry density of 100 pounds or less per cubic foot is not suitable for engineered wood floors. To check for lightweight concrete, draw a nail cross the top. If it leaves an indentation, it is probably lightweight concrete. Lightweight concrete can be used if properly treated. Check with the adhesive manufacturer for the proper material to use
- Concrete sub-floors should always be checked for moisture content prior to the installation of wood flooring. Standard moisture tests for concrete sub-floors include relative humidity testing, calcium chloride test and calcium carbide test.
- Measure the moisture content of the concrete slab using a TRAMEX concrete moisture meter. If it reads 4.5% or above, then this slab must be checked using calcium chloride tests. Flooring should not be laid if the test result exceeds 3 lbs per 1000 sqft of vapor emission in a 24-hour period.

Please follow the ASTM guideline for concrete moisture testing.

- As an alternative method of concrete moisture testing, In situ relative humidity testing may be used. Reading shall not exceed 75% of relative humidity.

### Sub-floors other than wood or concrete

- Ceramic, terrazzo, resilient tile and sheet vinyl, and other hard surfaces are suitable as a sub-floor for engineered hardwood flooring installation.
- The above tile and vinyl products should be level and permanently bonded to the sub-floor by appropriate methods. Clean and abrade surfaces to remove any sealers or surface treatments to insure a good adhesive bond. Do not install over more than one layer that exceeds 1/8" in thickness over suitable sub-floor.
- Substrate must meet or exceed adhesive manufacturers guidelines for flatness
- Additional requirements for flatness are required for floating floors as stated in installation guidelines.

### General Radiant Heat Installation Instructions

- To minimize the effect that rapid changes in temperature will have on the moisture content of the wood floor, NWFA recommends that an outside thermostat be installed. If one is not present, we suggest that this should be considered. Unlike conventional heating systems, which switch on as needed, radiant systems work most effectively and with less trauma to the wood floor if the heating process is gradual, based on small incremental increases in relation to the outside temperature.
- Subfloors should have proper moisture tests according to the moisture testing procedures outlined in Chapter 3. Of the National Wood Flooring Association Installation instructions
- The essential requirement in proper applications of wood flooring over radiant heated systems is to avoid penetration of the heating element. Radiant-heated subfloor systems can be concrete, wood or a combination of both.

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- If the subfloor is concrete and it has cured, turn the heat on, regardless of season, and leave it on for at least 5-6 days to drive out residual moisture before installation of the wood flooring.
- Some installation systems, particularly glue-down applications, require the heat to be reduced or even turned off before installation of the flooring begins, so the adhesive does not cure excessively.
- With water-heated radiant-heat systems, a pressure test must be performed and documented by a qualified plumber or the system installer prior to beginning the installation of the wood flooring.
- If flooring materials that conduct heat at different rates are on the same circuit or heating zone, check with the HVAC mechanical engineer before proceeding. Insure that floor temperature does not exceed 82 degrees
- Radiant heat is dry heat. A humidification system may be necessary to maintain wood flooring in its comfort zone.
- It is the responsibility of the Owner/Installer to determine the correct installation method over Radiant Heat. Please refer to National Wood Flooring Installation Guidelines - Appendix H for additional information
- Subfloors should have proper moisture tests according to the moisture testing procedures outlined in Chapter 3. Of the National Wood Flooring Association Installation instructions.

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- To achieve a uniform color and shade mixture across the entire floor, open and work from several different cartons at a time.
- Stagger the ends of boards and maintain at least 6" between end joints on all adjacent rows when material permits.
- Distribute lengths, avoiding "H" patterns and other discernible patterns in adjacent runs. Stagger end joints of boards row to row a minimum of 6" for strip flooring, 8-10" for 3" to 5" plank, and 10" for plank wider than 5" for better visual effects when possible. However the length of the material may dictate end joint proximity. Close end joint proximity may affect structural stability on mechanically fastened installations if there is deflection of the substrate present.
- Undercut door casings 1/16" higher than the thickness of the flooring being installed. Also remove existing moldings.
- Start installation parallel to the longest unbroken wall. An outside wall is often used, however insure all walls are straight/plumb prior to beginning
- Expansion space shall be left around the perimeter at least equal to the thickness of the flooring material. For floating installation, the minimum expansion space shall be 1/2" regardless of the thickness of the material.

### Glue-Down Installation Guidelines (Recommended)

- Snap a working line parallel to the starting wall, leaving appropriate expansion space around all vertical obstructions. Secure a straight edge on the working line before spreading adhesive. This prevents movement of the boards that can cause misalignment.
- Apply urethane, modified polymer or modified silane adhesives using a trowel recommended by your glue manufacturer. **Do not use a water-based adhesive with this hardwood flooring product.**
- Some adhesive residues can damage finish if left on too long. It is imperative that you clean off as soon as possible to avoid damage. Finish damage caused by adhesive residue is not covered by the manufacturer's warranty
- Spread adhesive from the working line out to approximately the width of two or three boards.

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- Install a starter board along the edge of the working line and begin installation. Boards should be installed right to left with the tongue side of the board facing the starting wall.
- Continue installation in this method
- 3-M Blue Tape can be used to hold planks tightly together and reduce minor shifting of floors during installation. Remove adhesive from the surface of the installed flooring as you work. All adhesive must be removed from flooring surfaces prior to applying 3-M Blue Tape. **Tape should never be allowed to remain on floor for an extended period and never overnight. No claims will be processed for tape damage.**
- Thoroughly clean, sweep, and vacuum installed floor and inspect the floor for scratches, gaps and other imperfections. **Do not apply any tape directly to the installed flooring to hold down floor protection.** The new floor can be used after 12-24 hours.
- Thoroughly remove all adhesive residue prior to leaving the job site. Be sure that any solvent used to remove adhesive is not directly applied to the floor. Any area wiped with a solvent rag must be re-wiped with a damp cloth to remove solvent residue.
- Be sure to change rag/cloth frequently to avoid spreading adhesive residue

### Nail or Staple Down Installation Guidelines

The construction and use of substrate products like OSB has continued to increase even though the actual nominal thicknesses have reduced in many instances. There can be noises such as squeaking, popping and crackling associated with mechanically fastening an engineered hardwood floor to these substrates. Our products are not warranted against the above referenced noises or against nail or staple pull through from the substrate

- A vapor retarder of asphalt - saturated paper should be installed on the sub-floor before installing hardwood floor. This will retard moisture from below and may prevent squeaks.
- Snap a working line parallel to the starting wall, allowing expansion space as specified above.
- Lay one row of boards along the entire length of the working line, with the tongue facing away from the wall.
- Top-nail and blind-nail the first row (hand nail if necessary), using appropriate fasteners. Blind nail at 45° angle through the tongue 1"-3" from the end joints and every 4-6" in between along the length of the starter boards. Each succeeding row should be blind-nailed whenever possible. Narrow crowned (under 3/8") 18-20 gauge thickness fasteners - Length of fasteners as follows: 1 1/4"- 1 1/2" staples or 1"- 1 1/4" cleats designed for engineered flooring. 3/8" flooring would use a minimum 1" fastener, 1/2"- 9/16" flooring would use a minimum 1 1/4" fastener with 1 1/2" being preferable. Spacing of fasteners should be as follows - Staples should be placed every 3" - 4" and cleats should be placed every 4" - 6". All fasteners should be placed within 1" -2" of end joints. **1/2" crown - 15 1/2 gauge staples typically used for solid wood flooring should not be used.** Fasteners should hit the joist whenever possible. To ensure proper alignment of flooring, make sure the flooring along the working chalk line is straight. Denser species may require pre-drilling the holes in line is straight the tongue.
- Continue the installation until finished. Distribute lengths, staggering end joints as recommended above.
- Thoroughly clean, sweep, and vacuum installed floor and inspect the floor for scratches, gaps and other imperfections. **Do not apply any tape directly to the installed flooring to hold down floor protection** The new floor can be used after 12-24 hours.

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### Floating Installation Guidelines

- Sub-floor flatness is critical to the success of a floating floor installation. **A flatness tolerance of 1/8" in a 10foot radius is required for floating floor installation.**
- Install leading brand pad - 2 in 1, 3 in 1, 4 in 1 and recycled rubber. Follow pad manufacturer's instructions. If it is a concrete sub-floor, it is required to install a 6 mil polyethylene film.
- Use Tongue and Groove adhesive or similar product as recommended by your retailer/distributor
- Snap a working line parallel to the starting wall, allowing expansion space as specified above.
- Boards should be installed left to right with the tongue facing away from the wall. Install first three rows by applying a thin bead of glue in the groove on the side and end of each board. Press each board firmly together and lightly use a tapping block if necessary.
- Continue installation as above by applying a thin bead of glue in groove side and end groove of every board throughout installation
- Clean excess glue from between boards with a clean cotton cloth. Tape each board together at side and end seams using 3-M Blue Tape. Allow glue to set before continuing installation of subsequent rows.
- Continue the installation until finished. Distribute lengths, staggering end joints as recommended above.
- Maximum span without a transition is recommended to be 40 ft in any direction. Additionally it is recommended that transitions be installed at any doorway or opening less than 72 inches.
- Thoroughly clean, sweep, and vacuum installed floor and inspect the floor for scratches, gaps and other imperfections. **Do not apply any tape directly to the installed flooring to hold down floor protection.** The new floor can be used after 12-24 hours.

- **Check jobsite thoroughly for any adhesive residue left on flooring.**
- **Check to make sure all chips and nicks are properly colored.**
- **Check to insure all acceptable gaps are filled with like-colored putty**

