**PRE INSTALLATION & JOBSITE CONDITIONS**

It is the installer/owners’ responsibility to ensure that the jobsite conditions and jobsite subfloor are environmentally and structurally acceptable prior to the installation of any hardwood flooring. The manufacturer declines any responsibility for failures or deficiencies of hardwood flooring resulting from or related to sub-floor, sub-surface, or job-site environmental conditions. All substrates must be clean, flat, dry, and structurally sound.

- Subfloors must be clean and free of dirt, curing compounds, sealers, drywall mud, paint, wax, grease, urethane, or other materials that may affect the integrity of the flooring material or adhesives used to install the flooring.
- All subfloors and subfloor systems must be structurally sound and must be installed following their manufacturer's recommendations. Local building codes may only establish minimum requirements of the flooring system and may not provide adequate rigidity and support for proper installation and performance of a hardwood floor. Whenever possible install the planks perpendicular to the floor joists for maximum stability. Our warranties DO NOT cover any problems caused by inadequate substructures or improper installation of said substructures.
- Test wood subfloors and wood flooring for moisture content using a pin-type moisture meter. Take readings of the subfloor — minimum of 20 readings per 1,000 sq. ft. and average the results. In most regions, a "dry" subfloor that is ready to work on has a moisture content of 12% or less and the wood should be within 4% of the subfloor moisture content.
- ASTM F-2170 – in-situ relative humidity – 75% RH or less is acceptable. Readings greater than 75% RH require the use of a proper vapor retarder.
- ASTM 1869 - The moisture content for concrete subfloors must be cured for a minimum of 30 days.
- Test wood subfloors and wood flooring for moisture content using a pin-type moisture meter. Take readings of the subfloor — minimum of 20 readings per 1,000 sq. ft. and average the results. In most regions, a "dry" subfloor that is ready to work on has a moisture content of 12% or less and the wood should be within 4% of the subfloor moisture content.
- ASTM F-2170 – in-situ relative humidity – 75% RH or less is acceptable. Readings greater than 75% RH require the use of a proper vapor retarder.
- ASTM 1869 - The moisture content for concrete subfloors registered after a calcium chloride test should not be greater than 3 pounds per 1,000 square feet of area. If it exceeds these limits, DO NOT install the flooring. Before moisture testing begins, the slab must be cured for a minimum of 30 days.
- Basements and crawl spaces must be dry. Use of a 6 mil black polyethylene is required to cover 100% of the crawl space earth. Crawl space clearance from ground to underside of joist to be no less than 18" and perimeter vent space must be equal to 1.5% of the total square footage of the crawl space area to provide cross ventilation. Where necessary, local regulations prevail.
- The subfloor must be flat, meeting a minimum of 3/16" within 10’ or 1/8" in 6’.

### Concrete subfloors

Grind high spots or use a Portland-cement-based leveling material (minimum compressive strength 3000 psi) to fill all low spots. Follow the leveling compound manufacturer’s instruction. Leveling compounds must be allowed to thoroughly cure and dry prior to installation of wood flooring.

### Wood subfloors

For staple down application use layers of 15lb. felt or wooden shims to fill low spots. Staples must be able to penetrate for holding power.

- All "wet" work – i.e. – paint, drywall, concrete, masonry, plumbing must be complete and dry well in advance of delivery of hardwood flooring.
- Gutters and downspouts should be in place and the exterior grade complete to allow for proper drainage of water away from the building’s exterior perimeter.
- Flooring should not be exposed to extremes of humidity or moisture.
- Permanent HVAC should be on and operational a minimum of 5 days and maintained between 65 – 75 degrees and a relative humidity of 35% - 55% prior to delivery, during, and after installation of the flooring.
- If HVAC is not possible at time of installation the environmental conditions must be at or near normal living conditions between 60 – 80 degrees and at the average yearly relative humidity for the area.

It is the Installer/Owner responsibility to ensure that the conditions are acceptable prior to the installation of the hardwood floors. The manufacturer declines any and all problems with the hardwood flooring that are related to or attributed to improper jobsite conditions.

### Recommended Subfloor Surfaces

**Concrete Subfloor Guidelines**

Concrete subfloors should be of high compressive strength and constructed to prevent groundwater from permeating the concrete. Engineered hardwood flooring can be installed on, above, or below-grade. In addition, it can be installed over above-ground, suspended concrete floors. The suspended concrete must be a minimum of 1/2 inches thick and must be structurally sound. The exception to this is lightweight concrete (which usually contains high amounts of gypsum) having a density of 100 pounds or less per cubic foot. Test for lightweight concrete by using a nail to scratch the surface of the concrete. If the concrete crumbles or turns to powder, it is not sound and you should NOT install the hardwood flooring. Use the floating installation method (5 ply products 3” or wider) only for lightweight concrete subfloors.

**Wood Subfloor Guidelines**

Subfloor panels should conform to U.S. Commercial Product Standard PS1-07, Construction and Industrial Plywood and/or US Voluntary PS 2-04 and/or Canadian performance standard CAN/CSA 0325.0-92 Construction Sheathing. Other CASA panels are acceptable after a calcium chloride test.

Acceptable Panel Subfloors: Truss/joist spacing will determine the minimum acceptable thickness of the panel subflooring.

- On truss/joist spacing of 16” o/c or less the slab must be a minimum of 1/2” in 6’.
- For truss/joist spacing of more than 16”, up to 19.2” (488mm) o/c, the standard is nominal 5/8” (3/2”, 18.3 mm) T&G Exposure 1 plywood subfloor panels, (Exposure 1) or nominal 3/4” 23/32”, (18.3 mm) OSB Exposure 1 subfloor panels, 4’x8’ sheets glued and mechanically fastened.
- Truss/joist spaces over more than 19.2” (488mm) o/c up to a maximum of 24” (610mm) require minimum 7/8” T&G CD Exposure 1 plywood subfloor panels, (Exposure 1) or nominal 3/4” 23/32”, (18.3 mm) OSB Exposure 1 subfloor panels, 4’x8’ sheets, glued and mechanically fastened.
- Some truss/joist systems cannot be cross-braced and still maintain stability.
- For concrete subfloors in new construction, use a minimum of 5/8” or 3/4” plywood subflooring on top of the concrete subfloor. This will provide a stable surface for installation of the hardwood flooring.
- For existing wood subfloors, install new flooring at right angles to the existing flooring.
- Do not glue, staple, or nail down hardwood flooring over particle board, floating application is acceptable (products 3” or wider).
- Do not install over existing glue down hardwood floors.

---

**Tools and Equipment Needed:**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broom or vacuum</td>
<td>Safety Glasses</td>
</tr>
<tr>
<td>Tape</td>
<td>Hand saw</td>
</tr>
<tr>
<td>Measure</td>
<td>Electric Meter Clean Green™ Hardwood</td>
</tr>
<tr>
<td>Chalk Line &amp; Chalk Hammer</td>
<td>Pry Bar NIOSH designated Dust Mask</td>
</tr>
<tr>
<td></td>
<td>Floor Cleaner/ Shaw R2X</td>
</tr>
</tbody>
</table>

---

**Special Notes:**

- **Concrete Subfloor Surfaces:**
  - Recommended subfloor surfaces for concrete subfloors include:
    - Plywood subfloor panels, Exposure 1
    - OSB subfloor panels
- **Recommended Wood Subfloor Surfaces:**
  - Plywood subfloor panels, Exposure 1
  - OSB subfloor panels

---

**At Attention California Installers & Consumers**

**WARNING**

Installation of this product and wood product may create wood dust, which is known to the State of California to cause cancer.
Blending of Cartons: To achieve a uniform appearance across the entire floor, we highly recommend that you open and work from several cartons at a time and dry-lay the flooring, mixing the planks from several cartons. This will allow you to blend the planks for maximum aesthetic appearance. Make certain the room is well lit to ensure color is consistent and that any visual defects can be seen and removed.

Match Transition Moldings: For best appearance blend all transitions and moldings to planks that have similar color and graining. Set them aside for use as needed.

Layout of Flooring: “Racking the Floor” is essential to achieve a random appearance. Start by either using random-length planks found in the carton or by cutting four or five planks in random lengths, differing by at least six inches. As you continue working across the floor try to maintain a six-inch minimum between end joints. Randomly install different lengths to avoid a patterned appearance. Never waste materials; the end cuts from starter rows should be used at the opposite side of the room to complete rows or used to start the next row.

Expansion space: Expansion space around the perimeter is required and should be equal to the thickness of the flooring material. For floating installation the minimum is 1/16" regardless of the thickness of the material. For commercial installations use a minimum of 3/16" expansion.

GLUE DOWN INSTALLATION GUIDELINES

| Additional tools & material needed: | Hardwood Adhesive |
| Clean White Rags | Mineral Spirits/ Urethane Adhesive Remover |
| Adhesive Trowel | Straight Edge |

NOTE: REFER TO THE ADHESIVE LABEL FOR PROPER TROWEL REQUIRED, SPREAD RATES AND INSTALLATION APPLICATION INFORMATION!

Before you begin using the following instructions, please refer to the Pre-Installation Job Prep information above.

Getting Started
1. Select a starter wall. An outside wall is best: it’s most likely to be straight and square with the room. Measure out from this wall, at each end, the width of two planks including the tongue plus the space needed (3/8" or ½") for expansion.
2. Snap a chalk line from these points, parallel to that wall.
3. Prior to installing the flooring, secure a straight edge inside the chalk line to act as a guide and to prevent the row of planks from shifting during installation. The straightedge could be a straight piece of lumber or piece of flooring. Alternatively, the first row can be face-nailed with finishing nails into the wood subfloor or screw nailed into a concrete subfloor.

Spreading the Adhesive
Using the proper trowel, hold the trowel at a 45° angle to ensure proper spread rate of adhesive, apply pressure to allow the trowel to leave ridges of adhesive on the substrate with little adhesive left between the ridges. This will help to achieve the proper spread rate of the adhesive. Temperature and air flow across the adhesive can have an effect on the open time of the adhesive. 3X (or urethanes) will have a longer open time. Use water to remove dried adhesive and trowel new adhesive.

Installing The Floor
4. Spread adhesive from the chalk line/straightedge out to approximately the width of two planks. Install the first row of starter planks along the chalk line/straightedge and secure into position with the tongue facing the starter wall.

NOTE: Proper alignment is critical. Misaligned starter rows can cause side and end gaps to appear in proceeding rows of flooring. When you have the starter rows complete, you can begin the next row.
5. When you are certain the first two starter rows are straight and secure, spread adhesive 2 to 3 feet wide across the length of the room. As a general rule, never spread more adhesive than can be covered in 30 to 45 minutes. If the adhesive has skinned over remove dried adhesive and trowel new adhesive.
6. Continue to install planks and push them into place. Place the tongue of the board into the grooves of installed boards and press into the adhesive. As you continue working across the floor try to maintain a six-inch minimum space between end joints. Randomly install different lengths to avoid a patterned appearance.

NOTE: Never strike a rubber mallet or hammer directly on the flooring – this will help to save time. A damp rag with water or mineral spirits will remove adhesive. Frequently change towels to avoid leaving a haze on the flooring surface. See current edition of the Resilient Floor Covering Institute (RFCI) publication Recommended Work Practices for Removal of Resilient Floor Coverings for detailed information and instructions on removing all resilient covering structures. For current information go to www.rfci.com
Before you begin using the following instructions, please refer to the Pre-Installation Job Prep information above.

NOTE: Our products are not warranted against squeaking, popping or cracking when using staple-down or nail-down installation methods. Some squeaking, popping or cracking is normal and possible when using staple-down or nail-down installation methods. These symptoms may be aggravated in arid areas or during dry conditions.

SET UP AND USE OF PNEUMATIC STAPLERS AND NAILERS
Minor occasional noises within the flooring are inherent in all staple/nail-down installations and can change as environmental changes occur. This is not a manufacturing defect and is therefore not covered under our warranties (see warranty brochure for complete warranty coverage). You can help reduce squeaking, popping, and cracking by being sure that the subfloor is structurally sound, does not have any loose decking or joists, and is swept clean prior to installation. You should also be sure that your stapler or nailer is setting the fastener properly, not damaging the planks, and that you are using the correct nailing schedule. When used improperly, staples or cleats can damage wood flooring. If the tool is not adjusted properly the staples/cleats may not be positioned at the proper angle and cause blistering, peaking, squeaking, or cracking of the floor. Some models may require the use of an adapter to adjust for proper thickness. Test the tool on a piece of scrap material first - set the staple/ nailer flush on the tongue side of the plank and install a staple/cleat. Should the staple/cleat penetrate too deeply reduce the air pressure; if the staple/cleat is not deep enough then increase the air pressure using an in-line regulator. The crown of the staple/cleat must sit flush within the nail pocket to prevent damage to the flooring and to reduce squeaking. The flooring manufacturer is not responsible for damage caused by the mechanical fasteners.

INSTALLING THE FLOOR
6. Continue to install the flooring making sure to nail/staple 1”-2” from the ends and every 3”-4” thereafter. Make certain the tool is adjusted properly to ensure that the fastener is at the proper angle and is flush within the nail pocket. As you continue working across the floor try to maintain a six-inch minimum space between end joints. Randomly install different lengths to avoid a patterned appearance.

7. If needed use a tapping block to help engage the boards together until the tongue-and-groove is flush and tight and no gaps are present between adjacent planks. NOTE: Never use a rubber mallet or hammer directly on the flooring to engage the tongue-and-groove. This can damage the flooring and/or finish.

8. As you approach the end wall it may be necessary to cut the width of the last row – be sure to allow for the expansion along the end wall. Once the final cuts are made set planks into use of an air compressor.

9. The last few rows will need to be fastened by hand. To fasten the final planks into place, you must either manually blind nail and/or face-nail through the surface on the final planks. Drill pilot holes at a 45° degree angle to the floor and blind nail using 1” finishing nails. Alternatively, drill pilot holes in the face every 6” (try to drill holes in darker portion of the wood) and install with 1” finishing nails. Counter sink nails and fill with appropriate colored wood filler – remove excess filler from surface with a clean rag and proper cleaner.

FLOATING FLOOR INSTALLATION GUIDELINES
(5 Ply Products 3/8” & 5/8” thick, 3” or wider only)

- Additional tools & material needed:
  - A.F.B. Floating Floor Adhesive
  - Shaw T&G Adhesive
  - Terry Cloth towels
  - Foam underlayment
  - Pry/Pull Bar
  - Clean Green™ Hardwood Floor Cleaner / Shaw R2X
  - 6 Mil Poly Plastic Sheeting
  - Tapping Block & Spacers
  - 21 Underlayment

Before you begin using the following instructions, please refer to the Pre-Installation Job Prep information above.

- 6 Mil Polyethylene not required over a vinyl, wood, or a wood product sub floor.
- 6 Mil Polyethylene required over concrete type subfloors – on grade or below grade.
- Do not install over carpet.
- If installing over vinyl, ensure that the vinyl is secure to the sub floor. Do not install over perimeter glued vinyl.
- If installing over an existing wood floor, install the flooring at right angles to the wood floor.
- Secure creaking and loose floorboards with screws.
- Do not install over wood flooring glued to a concrete sub floor.
- Note: Larger rooms require additional expansion space. Add 1/16” to the width of the expansion space for every 3’ the room extends beyond 25’. Dimensions exceeding 40’ in length or width – it is recommended to use a T-Molding for proper expansion.

Getting Started
1. Remove all doors and shoe moldings. Undercut all door casings 1/16” higher than the thickness of the flooring and underlayment to be installed. Place a scrap piece of plank and a sheet of underlayment against the door casing to act as a guide and cut the door casing with a hand saw or power jamb saw set to the correct height.

2. After determining the direction to run the planks, measure the width of the room (the dimension perpendicular to the direction of the flooring). The last row of the flooring should be no less than 1 ½” wide; if it is less, cut the width of the starter row to avoid a narrow last row.

3. Select a starter wall. An outside wall is best: it's most likely to be straight and square with the room. Measure out from the wall, at each end, the overall width of the plank plus ½” for expansion. If the first row requires ripping then measure from the wall the width of the ripped board plus ½” for expansion. These symptoms may be aggravated in arid areas or during dry conditions.

4. Snap a chalk line using a (brightly colored chalk) from these points. Install Underlayment: Unroll the 6 mil. Poly sheeting overlapping edges 4” and seal seams with clear plastic tape. Allow the poly to run 2” up the wall and trim back after installation of flooring. Install 1/8” foam underlayment.

Note: Use of a floating floor 2 or 1 underlayment may be used. Follow manufacturer’s instructions for application installing the 2 in 1 underlayment.

10. Lay the remainder of planks in the second row. Make sure that the rows are straight and no gapping exists on the sides or ends. Once you have dry laid the first two rows, remove all the planks in order. You are ready to begin.

11. Begin gluing the boards; Run a continuous bead of adhesive along the Pre-Installation Job Prep information above. Along the groove of the short side (width) and the plank’s side groove (length). Proper alignment is critical. Misaligned starter rows can cause side and end gaps to appear in proceeding rows of flooring.

12. Install first row of planks with grooves facing the straight edge. Work from right to left. Complete the first row. Make sure there are no gaps between the boards. Use a tapping block if need to close the boards together. Immediately wipe away any excess adhesive with a clean, slightly dampened cloth.

CAUTION: Only use manufacturer’s recommended staples or cleats.

For 3/8” thick products the minimum length staple/cleat is 1”. For 5/8” thick products the minimum length staple/cleat is 1 ½”.

Read and follow the manufacturer's instructions for complete set-up and operation of equipment.
6. When gluing planks run a continuous bead of adhesive in the groove on both the end and length of the board.
7. Remove any excess glue that squeezes out onto surface of the planks with a clean damp rag. Change rags and water periodically to avoid leaving a haze on surface.

AFTER INSTALLATION & SEASONAL OPERATION
- 48 hours after completion of installation, slowly raise temperature of the heating system to its preferred operating level over a period of 5 days. **Do not allow the surface temperature to exceed 80°.**
- Humidity level must be maintained between 35%-55% R.H.
- Seasonal gapping should be expected.
- Surface checking can be expected if the proper humidity level is not properly maintained between 35-55% R.H. or if the floor’s surface temperature exceeds 80°.

COMPLETING THE JOB – ALL INSTALLATIONS
- Sweep or vacuum floor
- Clean the floor with proper hardwood floor cleaner
- Install transition pieces – thresholds, t-moldings, base boards and quarter round. Nail moldings to wall, not the floor.
- Inspect final floor for nicks and or minor gaps – fill with appropriate color wood putty.
- Unused material should be left with owner and stored in a dry place in case of future repairs are needed.
- Use plywood or hardboard when moving heavy appliances or furniture across floor.

Floor Protection During Construction
After installation, if you choose to protectively cover the floor, cover the floor completely, since some species are light-sensitive and uncovered areas may change color. Use a covering material with a vapor permeance (perm rating) of 1 perm or more (tested in accordance with ASTM E-96) to avoid trapping moisture/vapor on or within the floor. Any covering should be taped, using a low-adhesion tape, to base or shoe moldings. Avoid taping to finished flooring. When taping paper or sheets together, tape them to each other, not to the floor.

Moldings Help You Make Easy Transitions
T-Moldings: Used to create a transition between floor coverings of similar heights or to cover an expansion gap.
Stair Nosing: Used in conjunction with flooring installed on steps or provide a finished edge. Secure by gluing and nailing/ screwing down into place. Predrill holes to avoid splitting.
Reducer Strips: Used to transition floor coverings of differing heights-wood floor to vinyl, vinyl composition tile, or low-pile carpet. Can also be used to border a fireplace.
Thresholds: Used to transition floor coverings or to create a break between floor coverings – wood to carpet, can be used as a trim molding around fireplaces or sliding glass doors.
Shoe Base Moldings: Used to cover the expansion space between the floor and vertical surfaces. Can be used as a substitute for Quarter Round moldings when space is a limitation.
Quarter Round Moldings: Used to cover the expansion space between the Wall Base and your hardwood floor. You can also use them to make smooth transitions between the floor and cabinetry.
Wall Base Moldings: Can be stained and finished to the color of the flooring to be used an alternative to painted baseboards.

Floor Care and Maintenance
Remember, like any floor covering, our factory finished wood floors will show signs of wear over time, depending on the size and lifestyle of your family. By observing a few precautions and setting up a regular cleaning routine and maintenance program, you can expect years of beauty from your floor. The following are examples of the reasonable and necessary maintenance you are expected to perform. They are not intended to be an exclusive list.
1. Sweep or vacuum regularly since built-up grit can damage the surface of the wood. The vacuum head must be a brush or felt type. Be certain the wheels of the vacuum are clean and do not damage the finish. **Do not use a vacuum with a beater bar head.**
2. Remove spills promptly using a soft cloth and cleaning products recommended by the manufacturer.
3. Never wet-map, damp-map, or clean your floor with water or other products. This can severely damage the flooring and will void the warranties. Do not use hardwood floor cleaning machines or steam cleaners. See section on **Improper Maintenance.**
4. Use the manufacturer’s recommended Hardwood floor cleaners with a clean terrycloth mop. Always sweep or vacuum the floors prior to using wood floor cleaners. **Do not** allow excess cleaner to remain on the floors surface as this may permanently damage the wood fiber.

Important: Do not use oil soaps, liquid or paste wax products or other household cleaners that contain citrus oils, lemon oil, tung oil, silicon, or ammonia since these warranties do not cover damage caused by non-recommended products. Use of these and other such products will harm the long-term performance of your floor and may also affect its recoat ability.
6. **Do not** use 2 in 1 cleaners with polish that may contain acrylics or urethane polish to restore gloss – the use of these products will void the finish warranty and may produce unsatisfactory results when not applied properly.
7. Keep pets’ nails trimmed, and paws clean and free of dirt, gravel, grease, oil, and stains.
8. Place protective felt pads beneath furniture legs and feet to reduce scratches and dents. Replace pads as needed.
9. Use a dolly and protective sheets of plywood when moving heavy objects, furniture, or appliances.
10. Make certain furniture casters are clean and operate properly (a minimum 1” wide vinyl surface where it comes in contact with wood is recommended). Clean wheels periodically to remove dirt and debris.
11. Remove shoes with spiked or damaged heels before walking on floor.
12. Exposure to the sun and its UV rays accelerates the oxidation and aging of wood. This can cause the stain and/or wood to fade and/or to change color. We recommend that you rearrange rugs and furniture periodically so the floor ages evenly. Exotic species such as Brazilian Cherry are more susceptible to color change during the aging process. These warranties do not cover damage from the sun and its UV rays.
14. Maintain the proper Relative Humidity in your home between 35% - 55%. The use of a humidifier during heating seasons may help reduce shrinkage of the wood due to low humidity.