

PLEASE READ THE ENTIRE INSTALLATION INSTRUCTIONS BEFORE PROCEEDING WITH THE ACTUAL INSTALLATION

## OWNER / INSTALLER RESPONSIBILITY

- Hardwood flooring is a product of nature, which is characterized by distinctive natural variations in grain and color and are not considered flaws. Hardwood flooring will also experience a change in color over a period of time. The degree of change depends upon the specie and the amount of UV exposure. This hardwood flooring is manufactured in accordance with accepted industry standards, which permit a grading defect tolerance not to exceed 5%. The defects may be of a manufacturing or natural type.
- The owner/installer assumes all responsibility for final inspection of product quality. This inspection of all flooring should be done **before** installation. Carefully examine the flooring for color, factory finish, grade, and quality before installing it. Do not install (or cut off) pieces with glaring defects whatever the cause. If material is not acceptable, contact your distributor or dealer immediately before installation. Installation implies acceptance. **No warranty will be offered for material with visible defects once the product is installed.**
- Before beginning the installation of any hardwood flooring product, the installer must determine that the environment of the job site and the condition and type of the sub floor involved is acceptable, insuring that it meets or exceeds all requirements, which are, stipulated in the installation instructions which follow. The manufacturer declines any responsibility for job failure resulting from or associated with inappropriate or improperly prepared sub floors or job site environment deficiencies. For best results, we suggest using a National Wood Flooring Association Certified Professional for your flooring installation.
- The installer must document all site tests and the records must be available if a claim is filed.
- The use of stain, filler, or putty stick for the correction of defects, small cracks, or face nail holes during installation should be accepted as normal procedure.
- When ordering, 5-10% must be added to the actual square footage amount needed for grading and cutting allowances.
- We strongly recommend that you visit the NWFA website at [www.woodfloors.org](http://www.woodfloors.org) for installation help and maintenance tips.

## JOB SITE INSPECTION & ACCLIMATION

- In new construction, hardwood flooring should be one of the last items installed. All work involving water or potential ground debris (plumbing, dry wall, etc.) should be completed prior to wood flooring being installed. Heating and air systems should be fully operating, maintaining a consistent room temperature at 60-80° F and a constant relative humidity of 35-55%.
- Flooring should not be delivered until the building has been closed in and cement work, plastering, painting, and other materials are completely dry. New concrete and plaster should be cured and at least 30 days prior to moisture testing.
- Check basements and under floor crawl space to be sure that they are dry and well ventilated to avoid damage caused by moisture. Crawl spaces must have a minimum 6 mil black polyurethane film as a vapor retarder on the ground surface if the crawl space is not finished with cement.
- Moisture content of both the sub-floor and the flooring should be checked and recorded before any work begins.
- Flooring should be at the job site at least 48 hours prior to installation for acclimation. **The engineered flooring must be properly acclimated to temperature and humidity conditions prior to proceeding with installation. Do not open cartons until ready to install.** Follow the NWFA guidelines for acclimation ([www.nwfa.org](http://www.nwfa.org)) on the job site and moisture equilibrium.
- Handle with care. Do not stand on ends. Store flooring in a dry place, being sure to provide at least a four-inch air space on or around cartons.
- Do not store directly upon on grade concrete or next to outside walls. Cartons should be placed in the installation area.
- The installation site should have consistent room temperature of 60°-80° F and a constant relative humidity level of 35-55% for a minimum of 5 days prior to installation of any flooring product.
- Engineered flooring is for below grade, on grade or above grade installation only and **cannot** be installed in full bathrooms or other high moisture areas.
- Some Engineered Flooring can be installed over Radiant Heat using the floating floor method on or above grade. See approved species below or check with your distributor.

## SUB FLOOR PREPARATION

### APPROVED SUB FLOOR TYPES:

- 1) Agency approved 5/8"(19/32") minimum thickness or 3/4" (23/32") CDX Exposure 1 plywood 16" on center floor joists properly nailed.
- 2) Agency approved 3/4" (23/32") underlayment grade OSB Exposure 1 16" center floor joists properly nailed.

**Note:** When installing approved plywood or OSB, refer to specific structural panel manufacturer's instructions for fastening and spacing.

- 3) Agency approved underlayment grade particleboard.( Nail down and glue down installation not recommended on particleboard)
- 4) Existing wood floors (installed at right angle only).
- 5) Concrete Slab
- 6) Resilient tile, sheet vinyl, and ceramic tile only over an above mentioned and approved sub floor.

### SUB FLOORS MUST BE:

- **CLEAN** - Scraped or sanded, swept, free of wax, grease, paint, oil, previous or existing glues or adhesives, and other debris
- **SMOOTH/FLAT** - Within 1/8" on 6' radius. Sand high areas or joints, fill low areas (no more than 1/8") with a cement type filler no less than 3000 p.s.i. Follow the instructions of the leveling compound manufacturer, but make certain the leveling compounds are completely dry before beginning installation. Any irregularities may cause hollow spots between the flooring and sub floor in any installation method and are not warranted.

- **STRUCTURALLY SOUND** - Nail or screw any loose areas that squeak or show movement. Replace any delaminated or damaged sub flooring or underlayment. Avoid subfloors with excessive vertical movement. If the subfloor has excessive vertical movement or deflection before installation it is likely it will have deflection after the flooring is installed.
- **DRY** - - Moisture content of sub floor **must not** exceed 14% prior to installation of wood flooring. All moisture testing must be verified & documented before and after wood has been acclimated 48 hours and job site requirements met.

**WOOD SUBSTRATES:** Test the moisture of the wood substrate using a calibrated moisture meter approved for testing wood moisture according to the meter manufacturer. The reading should not exceed 14%, or read more than a 4% difference than moisture content of products being installed.

**CONCRETE SLABS (regardless of existing floor covering):** All concrete sub floors must be tested for moisture content prior to installation of the hardwood flooring. The concrete subfloor must be a minimum of 30 days old prior to moisture testing. The moisture content of the concrete sub floor must not exceed 3 lbs. /1000 sq. ft. /24 hour emissions per CCTM and or 75% per Relative Humidity Test

Below are methods to test to indicate moisture is present in the concrete sub floor:

- 1) Use an approved calibrated concrete moisture meter (Tramex Concrete Encounter) as a preliminary measurement for moisture. Follow manufacturer's specific calibration requirements.  
Any reading higher than 4% indicates the need for a Calcium Chloride (ASTM F-1868) and or Relative Humidity test (ASTM F2170) and pH test. The Tramex reading should not exceed 4.0 on the scale.
- 2) Perform a polyfilm test. Tape down 2' x 2' polyfilm squares (a clear garbage bag or plastic drop cloth will do) in several places on the floor. Wait 24-48 hours, and then check for the appearance of condensation on the inside of the bag or plastic for a darkening on the concrete sub floor. Either occurrence signals the likely presence of excess moisture, requiring a mandatory calcium chloride test.
- 3) Test with a 3% Phenolphthalein in Anhydrous Alcohol Solution. Do not apply solution directly to the concrete surface. First chip ¼" deep into the concrete test area and apply several drops of the solution. Any change in color signals the likely presence of excess moisture, requiring a mandatory calcium chloride test.
- 4) Once you have determined the moisture content and that moisture is present a calcium chloride and pH alkalinity test **must** be performed to determine the moisture emissions through the concrete slab of the moisture and alkalinity in the concrete floor so appropriate corrective action can be taken.
  - Perform a calcium chloride test according to the manufacturer's instructions. The maximum acceptable reading is 3-lbs. /24 hours/1000 sq. ft. for moisture emissions. Three test for the first 1,000 square feet and one test for every 1,000 square feet thereafter.
  - Perform a Relative Humidity test according to the manufacturer's instructions. The maximum reading is 75%. Three test for the first 1,000 square feet and one test for every 1,000 square feet thereafter.
  - Perform a pH alkalinity test according to the manufacturer's instructions. A pH reading of 6-9 on a pH number scale of 1-14 is acceptable.
  - If the test results exceed this number the concrete slab should be sealed with appropriate sealers to correct those emissions as per the manufacturer's recommendations. This must be documented before installation.

**Note:** If excessive moisture (3-lbs. to 7-lbs.) is present or anticipated, use a moisture retardant system to seal the concrete or an inexpensive sheet vinyl/slip sheet glued directly to the concrete slab to reduce vapor intrusion. Follow the instructions of the sheet vinyl manufacturer, using a premium grade alkaline resistant adhesive, and full spread application system to bond the vinyl to the subfloor. For additional requirements and information, refer to our Slip Sheet Technical Note.

**Note:** If a sub floor has been flooded or rained upon, it may not be suitable to install flooring.

#### **INSTALLATION on WOOD SUBSTRATE:**

**Note:** Do not use the glue down or staple down installation method on underlayment grade particleboard.

Sub floor should be constructed of 5/8" (19/32") or thicker plywood or 3/4"(23/32") OSB when installing directly over minimum 2 x 10 floor joists 16" on center. For up to 19.2" on center 3/4"(23/32") plywood or OSB should be used. For 19.2" to 24" on center 7/8" plywood or OSB should be used. Structural Panels must be installed sealed side down. Plywood sheets should be laid with grained outer plies at right angles to joists; adjacent rows staggered four feet and nailed every 6" along each joist with 7D or larger nails. When installing directly over old wood or strip floor, sand any high spots, re-nail old floor to eliminate squeaks or loose boards, and install new planks at right angle (perpendicular) to the old floor, or overlay old floor with 1/4" plywood underlayment. Leave a 1/8" gap at the edges and nail with 7D or larger nails every 6" at the edges and every 12" in both directions and through the interior of each sheet of plywood. Edge swell should be flattened. The moisture content of the wood or plywood should not exceed 14%.

#### **INSTALLATION on CONCRETE SLABS:**

All concrete sub floors should be tested for moisture content. New concrete slabs require a minimum of 90 days curing time before installation. Concrete sub floors must be free of existing adhesives, grease, oil, dirt, and curing compound. These may be removed chemically or mechanically, but do not use a solvent based stripper. The residual solvents can prohibit satisfactory bond of floor adhesives, the concrete, and the flooring. To ensure a lasting bond make sure the perimeter of the foundation has adequate drainage and vapor retarder

Apply a liquid based moisture vapor retarder coating to the subfloor. Over concrete use only concrete moisture sealer systems that are specifically designed for moisture suppression and adhesive bonding properties. Follow manufacturer's guidelines and recommendations. The underlying floor must be permanently dry and protected against moisture. If this requirement is not met, the planks can swell, shrink and warp and may void the warranty.

#### **Note: LIGHTWEIGHT CONCRETE:**

Lightweight concrete has a dry density of 100 pounds or less per cubic foot and is only suitable for engineered wood floors when using the floating installation method. Many products have been developed as self-leveling toppings or floor underlayment. These include cellular concrete, resin reinforced cementations, underlayments and gypsum-base materials. Although some of these products may have the necessary qualifications of underlayment for wood flooring installation, others do not. To test for lightweight concrete, scrape a coin or key across the surface of the sub-floor. If the surface powders easily or has a dry density of 100 pounds or less per cubic foot, use only the floating installation method.

#### **INSTALLATION on SUB-FLOORS OTHER THAN WOOD OR CONCRETE:**

Do not install over carpets.

**Note:** Perimeter glued resilient vinyl and rubber tiles are unacceptable underlayments and must be removed.

Terrazzo, marble, tile and any other hard surfaces that are well bonded to sub floor, dry, structurally sound and level, as described above, are suitable as a sub floor for this engineered hardwood flooring installation. As above, the surface must be sound, tight, and free of paint, oil, existing adhesives, sealers, wax, grease, and dirt. Terrazzo, marble, and ceramic tile must be scuffed to assure adhesion.

The flooring can be glued or floated directly over full spread permanently bonded acoustical cork. Density should be 11.4 lb. / cubic ft. and installed according to cork manufacturer's recommendations. Do not use foam underlayment when using the floating method over cork.

**ASBESTOS WARNING!** Do not sand existing resilient tile, sheet flooring, backing, or felt linings. These products may contain asbestos fibers that are not readily identifiable. Inhalation of asbestos dust can cause asbestosis or other serious bodily harm. Check with local, state, and federal laws for handling hazardous material before attempting the removal of these floors.

#### INSTALLATION ON RADIANT HEATED SUBFLOORS:

- Use floating floor installation only. Do not use the glue down or staple installation method on radiant heat flooring.
- Only Oak, Elm, Maple or Birch are approved for use on radiant heat applications. **Do not use American Cherry, Reclaimed Pine, Hickory, Acacia, or any Exotic Species.**
- Warranty will be voided if anything other than approved species or installation method is used.
- The end consumer should be aware that minor gapping between wood planks during the heating season is a normal occurrence with hardwood flooring installed over radiant heated systems.
- The surface temperature of the subfloor must not exceed 80 degrees.
- To reduce the impact that rapid temperature changes can have on the moisture content of wood flooring, it is recommended to use an outdoor thermostat.
- Gradual heating, based on small incremental changes in relation to the outside temperature, is best for maintaining wood floor stability.

#### JOB SITE PREPARATION

- Verify floor is level and structurally sound. Repair as needed. Sub floor irregularities may cause any wood flooring installation to develop hollow spots between the flooring and the sub floor. These are not the result of any manufacturing defect.
- Proper moisture testing is the key to determine readiness for installation.
- Follow the NWFA guidelines for acclimation ([www.nwfa.org](http://www.nwfa.org)) on the job site and moisture equilibrium.
- Undercut door casings
- Remove any existing wall base, shoe molding, quarter round or doorway thresholds
- Regardless of the installation method all floors should be racked.

#### FLOATING FLOOR INSTALLATION METHOD

##### REQUIRED TOOLS AND ACCESSORIES:

- Tape Measure
- Moisture Meter (wood / concrete)
- Underlayment and Vapor Retarder( if needed)
- Mallet (light colored)
- Circular or Hand Saw
- Miter or Table Saw
- Pry Bar
- Drill with 1/16" bit
- Tapping Block
- Chalk Line and Chalk
- Hammer
- Safety Equipment (Goggles & Mask)
- Utility Knife
- 3/8 "or 1/2" Spacers
- Hardwood Flooring Cleaner
- Tongue and Groove Flooring Adhesive(PVAC)
- Broom

**APPROVED SUB FLOOR:** All sub floors should be covered with either a 3 in 1 Underlayment or an approved 1/8" thick closed cell foam underlayment. When using a 1/8" thick closed cell foam underlayment over a concrete sub floor, you must also use a 6 or 8 mil polyethylene film which acts as a vapor retarder.

**BELOW GRADE:** All engineered products when installed using the floating installation method, can be installed below grade. However the following instructions must be followed.

The concrete slab should be sealed or painted with a good concrete sealer. Then the 3 in1 Underlayment or the 6 mil poly film should be installed with ends butted together and taped with a clear 2" packaging tape to prevent any moisture from coming up through the seams. The 3 in 1 underlayment or 6 mil poly film should be lapped up the wall 4" all the way around the room. This can be trimmed off after moldings are installed. If you are using the 3 in1 underlayment, you are ready to begin the installation. However, if you have used the 6 mil poly film, roll out on top of the 6 mil poly film a 1/8" thick closed cell foam, butting the edges but not overlapping.

#### RADIANT HEAT SUB FLOORS:

**ONLY PREFINISHED OAK, ELM, MAPLE OR BIRCH ARE APPROVED FOR USE ON RADIANT HEAT APPLICATIONS. DO NOT USE AMERICAN CHERRY, RECLAIMED PINE, HICKORY, ACACIA, OR ANY OTHER EXOTIC SPECIES. WARRANTY WILL BE VOIDED IF ANTHING OTHER THAN APPROVED SPECIES IS USED.**

**RADIANT HEATING SYSTEMS USED MUST BE DESIGNED AND CONTROLLED SPECIFICALLY FOR HARDWOOD FLOORING BY THE SYSTEM MANUFACTURER AND MUST INCLUDED AN OUTSIDE TEMPERATURE PROBE AND SURFACE TEMPERATURE CONTROLS.**

Follow the below grade instructions (above) for underlayment requirements and installation instructions. Most radiant heat installations call for the requirements below when installing over radiant heat systems. Always refer to the manufacturer of the radiant heating system for detailed instructions.

- Newly installed water- heated-radiant- heat systems should be operational for a minimum of 4 weeks with the temperature set between 64°-68°F to insure a dry subfloor with the proper moisture content.
- Existing water- heated-radiant- heat systems must be operated a temperature of 64°F 4 for a minimum of 4 days before acclimation and installation of hardwood flooring.
- A pressure test must be performed and documented prior to installation.
- At the time of installation, sub floor must be 64°-68°F.
- Use floating floor installation only. Do not use the glue down or staple installation method on radiant heat flooring.
- Use an adhesive approved by the system manufacturer for edge and end joints
- After installation do not change the radiant heat settling for 48 hours.
- Gradually increase the heat in 3 - 5 ° increments daily to adjust the heating system temperature up or down to allow the flooring to adjust to the temperature changes
- The maximum temperature of sub floor under normal use should not exceed 85° F. (Check with heat system manufacturer).
- For correct water temperature inside heating pipes, check with manufacturer's suggested guidelines.
- Heating pipes must be covered with 1 1/4" of concrete or minimum 1/8" below bottom side of plywood sub floor. In addition, for plywood sub floor, heat transfer plates or insulation boards must be under pipes.
- Room temperature should be maintained between 60-80 ° F and not vary more than 15° F from season to season.
- Relative Humidity must be maintained in the range of 35-55% humidity in the home for radiant heated rooms.
- Always refer to the manufacturer of the radiant heating system for detailed instructions.
- For additional information refer to our Radiant Heat Technical Note.

**IMPORTANT: DO NOT INSTALL CABINETS OR WALLS ON TOP OF THE FLOORING WHEN USING THE FLOATING INSTALLTION METHOD.**

#### **Step 1: POSITION THE FIRST ROW**

**Important:** The flooring should be installed from several cartons at the same time to insure proper color, grain, and shade mix.

- Before starting, first measure the width of the room, and then divide the room's width by the width of the plank. If this means that the last row of planks will be narrower than 2", then you will need to cut the first row of planks to make it narrower. Cut in such a way that both rows of planks (the first and last to be installed in the room) will have the same approximate width for an overall continuous look. See installing the last row.

**Note:** To cut the boards, always saw with the teeth cutting down into the face or top of the board. Cutting from the top down helps protect the surface.

- Begin the installation of the planks in the left hand corner of the room with the long direction parallel to the incoming sunlight source or to the longest wall of the room (if this is possible). Be sure to install the first row of boards with the groove side facing the wall. Use 3/8" or 1/2" expansion spacers (depending on the thickness of the flooring) to provide a gap for the seasonal expansion of the flooring along the walls of the entire room. Always place expansion spacers against the wall where the two boards meet. This will make maintaining a good square easier.

**Note:** Larger rooms require additional expansion space. Add 1/16" to the width of the spacers for every 3' the room extends beyond 25'. **Dimensions exceeding 40' require the use of a t-molding for expansion.**

**Note:** When using the Floating install method, every doorway less than 6' wide must be transitioned using a t-molding.

- If the starting wall is out of square, it will be necessary to scribe the first row to match the wall, allowing the opposite side of the row to present a true square base for the rest of the floor. When the first row is complete, you must have a straight, even base established.

#### **Step 2: GLUING THE BOARDS TOGETHER**

- When installing the products which have been **approved** for the floating installation method, the boards must be side and end glued using tongue & groove Adhesive.
- Always apply the adhesive into the bottom of the groove on each board. Do not fill the groove. Apply a continuous bead, filling the bottom of the groove no more than halfway full. Start & stop adhesive 2" from the ends on the long side of the board and 1" from the ends on the butt end.

**Note:** If any excess adhesive squeezes up to the finished surface, wipe it off immediately using a water dampened cloth or adhesive remover. Then dry the surface and buff with a dry cloth. If the adhesive has dried, use a soft white cloth moistened with adhesive remover. Do not abrade the wood surface.

**Step 3: INSTALLING THE REST OF THE FLOOR**

**Note:** Always stagger 12" to 18" between end joints of adjacent board rows. The end joints should not repeat visually across the installed floor.

- After installing the first row of boards, apply the adhesive to the first board on the second row using the above gluing instructions.
- Connect that board to the first row making sure that there is at least a 6" stagger between the end joint of the board on the first row.
  - 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 3-5" plank, and 10" for plank wider than 5",
  - Work out of several cartons at a time to insure proper color and shade mixture.
- Tap the boards together with a hammer and a tapping block. Be sure that the tapping block is against the tongue only and use only a gentle tapping motion to tap the boards together. Excessive force will damage the board making it difficult to install additional boards. Do not tap on the groove side of the boards as this will cause damage to the boards. Once the board has been tapped into place check for a tight fit on sides and ends.
- To install the rest of the flooring, continue placing the boards from left to right, plank by plank, and row by row.

**Note:** When installing around fixed objects, small areas or even in general installation areas, the use of installation straps may prove helpful for securing boards together. Installation straps are a handy tool that will insure a tight fit when used to strap each continuous row of installation.

**Step 4: INSTALLING THE LAST ROW**

Most often the entire length of the last row will need to be cut so that it is narrow enough to fit the remaining space. When this occurs, follow this simple procedure:

- Lay a row of boards, unglued, with the tongue toward the wall, directly on top of the last row installed.
- Take a full width scrap piece of the product that is being installed with the face down and the tongue side against the wall. Use 3/8" or 1/2" spacers against the wall to ensure the proper expansion space.
- Draw a line along the row moving down the wall. The resulting line gives the proper width for the last row which, when cut, can then be wedged into place using the pull bar.

**Note:** Floor should remain free of foot traffic for a minimum of 12 hours while adhesive sets.

**Step 5: FINISHING THE FLOOR**

- A drying time of 24 hours is recommended before any damp mopping, cleaning or heavy objects or furniture can be put back into place.
- The use of putty or a non-silicone based filler to cover small cracks or face nails holes should be considered normal in hardwood flooring installations. Test filler on spare pieces first to ensure it blends with the floor.
- Make sure when the installation is complete that the expansion spacers are removed and the expansion space is covered with the appropriate molding such as baseboard and 1/4 round or shoe molding. Do not nail moldings into the floor but nail into the wall.
- Vacuum the floor thoroughly using the soft brush attachment or dust mop to remove any dirt and debris.
- Use a quality Hardwood Flooring cleaner to finish the floor. We recommend Bona Swedish Formula Hardwood Cleaner
- If the floor is to be covered, do not use plastic use a breathable wrap, or material such as cardboard or kraft paper to protect the finish.
- Final inspection by the end user should be conducted from a standing position.

**STAPLE DOWN INSTALLATION METHOD****REQUIRED TOOLS AND ACCESSORIES**

- \* Manual or Pneumatic Fastening Machines with 15-18 gauge 3/16" Crown Staples 1 1/4"-1 1/2" length
- \* Moisture Meter (wood & concrete)
- \* Circular or Hand Saw
- \* Miter or Table Saw      \* Drill with 1/16" bit
- \* Broom
- \* 15 lb. Asphalt Saturated Felt (not rosin paper)
- \* Tape Measure
- \* Mallet (light colored)
- \* Pry Bar
- \* Chalk Line and Chalk
- \* Hammer
- \* Safety Equipment (Goggles & Mask)
- \* Utility Knife
- \* Nail Punch
- \* Hardwood Flooring Cleaner

**NOTE:** Improper adapter plates and/ or staples/cleats can cause severe damage. Contact your Fastener Manufacturer for the proper adapter as well as recommended staples, cleats and air pressure.

Do not use staples or nails intended for 3/4" solid flooring.

- Avoid striking the edge of the prefinished flooring with the fasteners mallet. Edge crushing can occur causing cracks and splinters. Use a block to hammer against if necessary. Use only a flooring nailer that engages the top profile over the tongue at the appropriate angle. Make sure that the flooring nailer is flat against the board to prevent top edge damage. The plate in contact with floor must be smooth and free from nicks or scratches. Faceplates should be covered with protective materials to prevent damage to the surface of the flooring.
- For manual fasteners improper plate selection can cause severe edge damage. Check with the fasteners manufacturer to ensure that the proper adapter has been used for this nominal 3/8" or 1/2" flooring (9, 9.5, or 12 mm).
- For pneumatic fasteners, improper air pressure settings, and failure to use the proper adapters can cause damage to the flooring. The correct adapter and air pressure setting will properly set the fasteners in the nail pocket. Set air compressor to the fastener manufacturers recommended PSI setting or an initial pressure of 75 PSI. Use a compressor with an in-line regulator with an air hose for proper adjustments. Adjust the air pressure to insure proper setting of staples. If tongue damage occurs, lower the air pressure. If the staples do not set properly increase the air pressure.
- If you need to remove a side nailed staple, do not pull straight up from the tongue. This will damage the surface of the board. Instead, pull out the staple from the tongue at the front of the board with all pressure from the hammerhead directed into the sub floor.
- The manufacturer of the flooring is not responsible for any damage caused by the use of improper fasteners, improper adapters as well as staples or cleats or tools or minor squeaking on mechanically fastened floors.

## Step 1: ESTABLISH A STARTING POINT

- Before beginning the actual installation, provide proper layout of flooring by laying out several rows of flooring end to end in a staggered pattern.
- Allow for a minimum 6" stagger of the end joints of the adjoining row, distributing short and long lengths equally over the areas where the flooring is to be installed.
- Flooring is to be installed at right angles to the floor joists and, if possible, in the longest dimension of the room.
- Work out of several cartons at a time to insure proper color and shade mixture.
- To ensure that you have a good straight-line, place a mark 1" plus the width of the flooring on the end wall near a corner of the starting wall. Repeat on the opposite corner wall and insert nails into each mark. Snap a chalk line to provide a straight line to help align the planks
- Leave at least 3/8" to 1/2" for expansion at all vertical surface to be covered by the baseboard or quarter round trim. Normally the expansion space around the rooms should be the same distance as the thickness of the hardwood flooring.

## Step 2: INSTALLING THE FLOOR

- Fasten a sacrificial board to the floor and check for surface damage, air pressure settings, and tongue damage before proceeding. Make all proper adjustments before installation. Then remove and destroy the board.
- For the first row use the longest straightest boards.
- Align the first piece on the chalk line with the tongue out. The groove side and end will be facing the starting wall. Pre drill holes to avoid splitting. Drive 7d or 8d finish nails or screw type flooring nails into the face of the board every 6" approximately 1/3"-3/4" from the edge closest to the starting wall and within 2"-3" from the ends and in the darker grain of the wood. Keep the starter strip aligned with the chalk line.
- Edge nail the plank by driving the same type nails at a 45° angle through the tongue of the first piece, spacing the nails every 6" - 8" and within 2"-3" from the ends. Repeat this process for the entire first row. Upon completion of the first row, go back and sink the face nails with a nail punch. If it appears that the holes will not be covered by the quarter round or wall base, fill with putty that blends with the floor color.
- Repeat the edge nailing for the second row but do not face nail like the first row. Typically the first few rows must be edge nailed by hand due to the close proximity to the wall. When clearance allows, use the stapler/fastener.
- For ease of installation, work left to right. Left is determined by having your back to the wall where the starting course is laid. When it is necessary cut a strip to fit the right wall.
- 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 3-5" plank, and 10" for plank wider than 5".
- Install each succeeding row of planks by stapling/fastening the tongue side every 4"-6" to within 2" from board ends. Be attentive to staggering the ends of the boards at least 6" in adjacent rows to avoid clustering end joints.
- Upon reaching the last row to be installed, the planks should be ripped to allow a 3/8"-1/2" expansion space. Depending upon the board thickness, the last rows must be fastened by nailing approximately 1/2"-3/4" from the back edge of the board every 6" . The same process of counter sinking the face nails and applying putty should be repeated (as above on starting wall).

## Step 3: FINISHING THE FLOOR

- The use of putty or a non-silicone based filler to cover small cracks or face nails holes should be considered normal in hardwood flooring installations. Test filler on spare pieces first to ensure it blends with the floor.
- Make sure when the installation is complete that the expansion spacers are removed and the expansion space is covered with the appropriate molding such as baseboard and 1/4 round or shoe molding. Do not nail moldings into the floor but nail into the wall.
- Vacuum the floor thoroughly using the soft brush attachment or dust mop to remove any dirt and debris.
- Use a quality Hardwood Flooring cleaner to finish the floor. We recommend Bona Swedish Formula Hardwood Cleaner
- If the floor is to be covered, do not use plastic use a breathable wrap, or material such as cardboard or kraft paper to protect the finish.
- Final inspection by the end user should be conducted from a standing position.

## GLUE DOWN INSTALLATION METHOD

### REQUIRED TOOLS AND ACCESSORIES

- \* 3/16" x 5/32" deep v notch trowel or 1/4" x 1/4" x 3/16" square notch trowel. Follow adhesive manufacturers' guidelines.
- \* Use a top quality adhesive (follow the adhesive manufacturers recommendations)
- \* Preferred type: moisture cure urethane floor glue.
- \* Broom
- \* Tape Measure

- \* Moisture Meter (wood & concrete)
- \* Mallet (light colored)
- \* Circular or Hand Saw
- \* Miter or Table Saw
- \* Pry Bar
- \* Drill with 1/16" bit
- \* 6 - 8 d screw shank nails
- \* Chalk Line and Chalk
- \* Hammer
- \* Safety Equipment (Goggles & Mask)
- \* Utility Knife
- \* Nail Punch
- \* Hardwood Flooring Cleaner

**Step 1: GETTING STARTED**

- Install the flooring parallel to the longest outside (exterior) wall in the room. Measure out from the wall on the door side of the room in two places; 30 3/8" for 3" and 5" wide products. Mark and snap a chalk line across the two marks. The area between the chalk line and the wall is the working area and will be the last to be installed.

**Step 2: SPREADING THE ADHESIVE**

- Hold the trowel at a 45°-60° angle and spread adhesive onto an area no larger than 30-40 square feet at one time.
- After spreading, allow adhesive to flash off for 30-45 minutes before installing wood flooring. Maximum available working time is 45-50 minutes. (Colder temperatures or high humidity will extend times and warmer temperatures or low humidity will shorten times.)
- Do not install wood flooring material after adhesive dries. Test by touching adhesive. If not readily transferred to finger, adhesive is already dried. If adhesive has dried, remove adhesive and apply new material. Periodically check wood to confirm 100% adhesive transfer. Within one hour of setting wood, roll the installation with a 100-150 lb. roller to promote good contact with the adhesive.
- Always refer to the specific instructions on the hardwood flooring adhesive label.

**Step 3: INSTALLING THE FLOOR**

- The flooring should be installed from several cartons at the same time to insure proper color, grain and shade mix..
- After the adhesive has been spread following the above mentioned instructions, start with the first piece of flooring. Install the piece of wood with the groove towards you and the tongue facing the opposite wall. Line up the groove of the flooring with the chalk line then press the flooring into the adhesive.
- Working from left to right, lay the next board and continue working towards the right until you need to cut a piece to complete the first row. Measure the size you need to complete the first row and cut to length.
- 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".
- If the left over piece is less than 6" long, cut another piece at a random spot, and start the second row with it. Be attentive to staggering the ends of the boards at least 6" in adjacent rows to avoid clustering end joints. A soft rubber mallet can be used to tap the boards on the face until they are pulled into proper position.
- To cut the boards, always saw with the teeth cutting down into the face or top of the board. Cutting from the top down helps protect the surface.  
**For wood sub floors:** If you are working on a wood type sub floor, use small finishing nails to hold the first row in place. Fill nail holes with filler which is manufactured to blend with your flooring.  
**For concrete sub floors:** If you are working on a concrete sub floor, take a piece of 1" x 2" x 8' pine board and using 1" concrete nails, nail the board onto the dry side of your chalk line. This will hold your first row of starter boards in place.
- Complete the rest of the installation in your working area by following the same installation procedures that are stated in Step 2 of this section.
- Lift a plank periodically to make sure that there is 100% contact between the board and the hardwood flooring adhesive.

**Step 4: INSTALLING THE LAST ROW**

Most often the entire length of the last row will need to be cut so that it is narrow enough to fit the remaining space. When this occurs, follow this simple procedure:

- Lay a row of boards, unglued, with the tongue toward the wall, directly on top of the last row installed.
- Take a short piece of the hardwood flooring that is being installed with the face down and the tongue side against the wall.
- Draw a line with a pencil along the row moving down the wall. The resulting line gives the proper width for the last row which, when cut, can then be wedged into place using the pull bar.
- You will need to use the pull bar extensively to make the last row properly flush.

**Step 5: FINISHING THE FLOOR**

- A drying time of 24 hours is recommended before any damp mopping, cleaning or heavy objects or furniture can be put back into place.
- The use of putty or a non-silicone based filler to cover small cracks or face nails holes should be considered normal in hardwood flooring installations. Test filler on spare pieces first to ensure it blends with the floor.
- Make sure when the installation is complete that the expansion spacers are removed and the expansion space is covered with the appropriate molding such as baseboard and 1/4 round or shoe molding. Do not nail moldings into the floor but nail into the wall.
- Vacuum the floor thoroughly using the soft brush attachment or dust mop to remove any dirt and debris.

- Use a quality Hardwood Flooring cleaner to finish the floor. We recommend Bona Swedish Formula Hardwood Cleaner
- If the floor is to be covered, do not use plastic use a breathable wrap, or material such as cardboard or kraft paper to protect the finish.
- Final inspection by the end user should be conducted from a standing position.

**WARNING**

The State of California (OEEHA Prop 65, California Health, and Safety Code Section 25249.6) has classified Wood Dust as a substance known to cause cancer. Drilling, sawing, sanding, or machining wood products generates wood dust.

**IMPORTANT HEALTH NOTICE FOR MINNESOTA RESIDENTS:**

THESE BUILDING MATERIALS EMIT FORMALDEHYDE. EYE, NOSE, AND THROAT IRRITATION, HEADACHE, NAUSEA AND A VARIETY OF ASTHMA-LIKE SYMPTOMS, INCLUDING SHORTNESS OF BREATH, HAVE BEEN REPORTED AS A RESULT OF FORMALDEHYDE EXPOSURE. ELDERLY PERSONS AND YOUNG CHILDREN, AS WELL AS ANYONE WITH A HISTORY OF ASTHMA, ALLERGIES, OR LUNG PROBLEMS, MAY BE AT GREATER RISK. RESEARCH IS CONTINUING ON THE POSSIBLE LONG-TERM EFFECTS OF EXPOSURE TO FORMALDEHYDE.

REDUCED VENTILATION MAY ALLOW FORMALDEHYDE AND OTHER CONTAMINANTS TO ACCUMULATE IN THE INDOOR AIR. HIGH INDOOR TEMPERATURES AND HUMIDITY RAISE FORMALDEHYDE LEVELS. WHEN A HOME IS TO BE LOCATED IN AREAS SUBJECT TO EXTREME SUMMER TEMPERATURES, AN AIR-CONDITIONING SYSTEM CAN BE USED TO CONTROL INDOOR TEMPERATURE LEVELS. OTHER MEANS OF CONTROLLED MECHANICAL VENTILATION CAN BE USED TO REDUCE LEVELS OF FORMALDEHYDE AND OTHER INDOOR AIR CONTAMINANTS.

IF YOU HAVE ANY QUESTIONS REGARDING THE HEALTH EFFECTS OF FORMALDEHYDE, CONSULT YOUR DOCTOR OR LOCAL HEALTH DEPARTMENT.

**CARE GUIDE****CLEANING YOUR FLOOR**

- Use a damp cloth to blot up spills and spots as soon as they happen. For tough spots such as oil, paint, markers, lipstick, ink, tar or cigarette marks, use acetone/nail polish remover then wipe with a damp cloth. Always avoid allowing liquids to stand on your floor.
- Vacuum, (using the hard floor attachment not the beater bar), dust mop, or sweep the floor to minimize abrasive grit, debris, and dirt.
- **Do not** damp mop. Periodically clean the floor with a hardwood flooring cleaner, which is specially formulated for the finish. We recommend Bona Swedish Formula Hardwood Cleaner.
- **Do not** use oil based, wax, and polish, strong ammoniated or abrasive cleaners, steel wool or scouring powder to clean the floor.
- **Do not** wash or wet-mop the floor with soap, water, oil soap detergent or any other liquid cleaning material. This could cause swelling warping, delamination and joint-line separation, and void the warranty.
- **Do not** use any type of buffing machine.

**PROTECTING YOUR FLOOR**

- Use quality area rugs and doormats by outdoor entrance areas to prevent dirt, sand, grit and other substances such as oil, asphalt or driveway sealer from being tracked onto your floor. The rugs must be made of a breathable material to prevent moisture entrapment. Rugs with rubber bottoms or no-skid pads may leave an imprint on the flooring.
- Sweep, dust, or vacuum the floor regularly to prevent accumulation of dirt or grit that can scratch or dull the floor finish.
- Use protective casters/caster cups or felt pads on the legs of furniture to prevent damage to the flooring. Use wide bearing leg bases, barrel type caster wheels, rubber rollers to minimize indentations and scratches from heavy objects. As a rule of thumb, the heavier the object, the wider the floor protector should be. Make certain to keep them clean and well maintained.
- Do not use rubber or foam backed plastic mats as they may discolor or leave an imprint on the floor. To prevent slippage use an approved vinyl rug underlayment.
- Maintain a normal indoor relative humidity level between 35 and 55% and a temperature of 60°-80° F throughout the year, to minimize the natural expansion and contraction of wood.

**Heating Season (Dry):** A humidifier is recommended to prevent excess shrinkage due to low humidity levels. Wood stove and electric heat tends to create very dry conditions. Minor gapping between wood planks during the heating season is a normal occurrence with hardwood flooring installed over radiant heat.

**Non-Heating Season (Wet):** An air conditioner or dehumidifier or periodically turning on your heating system can maintain humidity during the summer months. Avoid excessive exposure to water during periods of inclement weather.

- Avoid gouges or cuts in your floor from sharp objects. While your floor is very wear resistant, sharp or pointed objects can nevertheless damage it.
- Don't walk on your floor with stiletto-style heels, spiked shoes, or cleats; they may cause indentations in your floor.
- Keep pet's nails trimmed to minimize finish scratches.
- Rearrange area rugs and furniture periodically so the floor ages evenly. UV sunlight will soften the tone of different species of hardwood to varying degrees.
- Protect your floor from direct sunlight. Use curtains and UV resistant film on large glass doors and windows. Over time natural and artificial light could discolor the floor. • Use a dolly when moving heavy furniture or appliances. But first, put down a sheet of quarter inch plywood or Masonite to protect the floor and help prevent denting. Carpet or cardboard is not adequate to prevent surface compression scratches. Never try to slide or roll heavy objects across the floor to avoid denting.

**REPAIRING YOUR FLOOR**

- Minor damage can be easily repaired with finishing putty available in blending colors.
- Retain several planks for future repairs.
- Major damage will require board replacement. If using the floating installation only, your floor can easily be disassembled to allow for replacement.

**MOLDINGS****Installation Tips:**

- Moldings must be predrilled avoid splitting whenever they are to be secured with nails or fasteners. Use a 10 or 12" miter saw with pre-set adjustments for the basic miter cuts at 22.5°, 45°, and 90°. A carbide tipped blade makes the best cuts.
- On Wall Base or Quarter Round moldings, never restrict the hardwood floor's natural contraction/expansion movement by driving the fasteners at a downward angle. Rather, attach the moldings to the wall or vertical surface.
- Always miter cuts rather than having butt cuts when splicing. Decide the direction of the miter by cutting the molding with the long point oriented in the same direction as your natural line of vision when you enter the room.

**Wall Base** - Borders the wood floor at the base of the wall to give the room a finished look. This molding conceals the required expansion space between the wall and the hardwood flooring. It is also sometimes used under cabinets and toe kicks.

**Quarter Round** - This molding conceals the required expansion space between the wall and the hardwood flooring. It is also sometimes used under cabinets and toe kicks where a wall base won't fit or at the base of the stairs to provide a subtle blend between the floor and the wall or vertical surface. Ensure nails are not going through the floor but into the vertical surface.

**Threshold** - Typically used at exterior doorways as a transition between flooring and the doorway threshold. It is also used to transition a wood floor to different floors to make them fit together perfectly, such as high pile carpeting or tile. Another typical use for a threshold is to conceal the expansion space between the flooring and a vertical surface such as fireplace hearths and sliding glass doors.

**T-Molding** - Commonly used in doorways to join two wood floors in adjoining rooms. Also recommended when making transitions from a wood floor to another floor that is approximately the same height such as ceramic tile, hardwood or laminate floors, not carpet. TMoldings are also used to provide expansion joints when a floor dimension exceeds the length of 40' or a width of 30'.

**Reducer** - Used to join hardwood floors that have been glued down or nailed down with floors of different heights such as vinyl, ceramic tile, or low pile carpeting.

**Stair Nose** - Provides the proper transition for stairways or steps which have hardwood floors that have been installed by either the nail down or glue down installation method. Also provides the proper overhang for a transition from one floor level to the next such as the step into a sunken living room.

