# ENGINEERED HARDWOOD FLOORING INSTALLATION GUIDELINES

## IMPORTANT INFORMATION BEFORE YOU BEGIN

It is **EXTREMELY IMPORTANT** that you read and understand this information completely prior to starting, since improper installation can void the warranties.

## INSTALLER/OWNER RESPONSIBILITY

Carefully inspect **ALL** material prior to installation for defects. Materials installed with visible defects are not covered under warranty. Remember – Wood is a natural product that can vary in color, grain, and contains natural characteristics that varies from plank to plank and is to be expected. We do not warrant against these natural variations from plank to plank or variations from sample to plank. Remember – If you are not satisfied with the flooring prior to installation, contact your dealer – **DO NOT INSTALL** the flooring. Accepting or rejecting the material must be done on full shipment of quantities only, not carton by carton or plank by plank. Material is manufactured to exceed industry standards (ANSI/HPVA EF 2009).

- **We urge you, as the final inspector to inspect for proper color, finish, style, and quality PRIOR to installation. Verify that the flooring is the correct material. Care should be taken at this time to remove or repair particular characteristics you do not desire. Manufacturer declines responsibility for any costs incurred when plank(s) with visible defects have been installed.**
- **The use of stain, filler, or putty stick for the correction of minor defects during installation should be accepted as normal procedure.**
- **5% cutting allowance, depending on layout, must be added to the actual square footage amount needed. (Diagonal, herringbone, or bordered installations will require a higher percentage)**

**Tools and Equipment Needed:**

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| **Broom or vacuum**<br>**Tape Measure**<br>**Chalk Line & Chalk**<br>**Hammer** | **Moisture Meter**<br>**Hand Saw**<br>**Electric Miter Saw/Table Saw**<br>**Pry Bar** | **Safety Glasses**<br>**Color Wood Filler**<br>**NIOSH designated Dust Mask** |

| **CAUTION: WOOD DUST** |
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| **The International Agency for Research on Cancer has classified wood dust as a nasal carcinogen. The sawing, sanding, and/or machining of wood products can produce wood dust that can cause respiratory, eye, and skin irritations.** Equipment should be equipped with a dust collector to reduce airborne wood dust. Wear an appropriate NIOSH designated dust mask to reduce exposure to airborne wood dust. Avoid contact with eyes and skin. In case of irritation, flush eyes or skin with water for at least 15 minutes. In cases of severe irritation; seek immediate medical attention. *For further technical or installation questions or to request a Product Specification Data Sheet contact the manufacturer. 1-800- 441-7429* |
| **WARNING Drilling, sawing, sanding or machining wood products can expose you to wood dust a substance known to the State of California to cause cancer. Avoid inhaling wood dust or use a dust mask or other safeguards for personal protection. For more information go to p65warnings.ca.gov/products/wood-dust** |

## PRE INSTALLATION & JOBSITE CONDITIONS

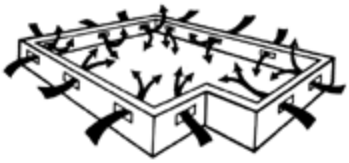
It is the installer/ owners' responsibility to ensure that the jobsite conditions and jobsite subfloor are environmentally and structurally acceptable prior to the installation of any hardwood flooring. The manufacturer declines any responsibility for failures or deficiencies of hardwood flooring resulting 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.
- Install cabinets prior to flooring to prevent damage to the flooring. Shaw is not responsible for removal of cabinets in the event of a claim.
- 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.



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- Test wood sub floors and wood flooring for moisture content using a pin-type moisture meter. Take readings of the subfloor – minimum of 20 readings per 1000 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 1000 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 spacing should 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. Use cementitious patching and leveling compounds that meet or exceed Shaw's maximum moisture level and pH requirements. Use of gypsum-based patching and/or leveling compounds which contain Portland or high alumina cement and meet or exceed the compressive strength of 3,000 psi are acceptable. 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.

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 slabs 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 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 Subfloors Guidelines

Subfloor panels should conform to U.S. Voluntary 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 CSA standards also apply.

**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 industry standard for single panel subflooring is minimum 5/8" 19/32", 15.1 mm) CD Exposure 1 subfloor panels, 4x8 sheets.
- On truss/joist spacing of more than 16", up to 19.2" (488mm) o/c, the standard is nominal ¾" (23/32", 18.3 mm) T&G CD Exposure 1 Plywood subfloor panels, (Exposure 1) or nominal ¾" 23/32", (18.3mm) OSB Exposure 1 subfloor panels, 4'x8' sheets, glued and mechanically fastened.
- Truss/joist systems spaced 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 minimum 7/8" OSB Exposure 1 subfloor panels, 4'x8' sheets glued and mechanically fastened – or two layers of subflooring or brace between the truss/joist in accordance with the truss/joist manufacturer's recommendations and with local building codes. Some truss/joist systems cannot be cross-braced and still maintain stability.
- For existing wood floors install new flooring at right angles to the existing flooring.



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- 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.

**Additional tools & material needed:**

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| **Hardwood Adhesive** | **Mineral Spirits /** |
| **Clean White Rags** | **Urethane Adhesive Remover** |
| **Adhesive Trowel** | **Straight Edge** |

**WARNING! DO NOT SAND, DRY SWEEP, DRY SCRAPE, DRILL, SAW, BEADBLAST OR MECHANICALLY CHIP OR PULVERIZE EXISTING RESILIENT FLOORING, BACKING, LINING FELT, ASPHALTIC “CUTBACK” ADHESIVES OR OTHER ADHESIVES.**
**These products may contain either asbestos fibers and/or crystalline silica. Avoid creating dust. Inhalation of such dust is a cancer and respiratory tract hazard. Smoking by individuals exposed to asbestos fibers greatly increases the risk of serious bodily harm. Unless positively certain that the product is a nonasbestos-containing material, you must presume it contains asbestos. Regulations may require that the material be tested to determine asbestos content and may govern the removal and disposal of material.**
**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**

**Ceramic tile and terrazzo:** All wax and sealers must be removed with an appropriate cleaner/stripper. Ceramic tile and terrazzo should be abraded to allow for proper adhesion. Check for loose tiles by tapping and re-adhere. Fill grout lines with a cementitious latex fortified leveling compound.
**Resilient tile, resilient sheet vinyl:** Material must be full spread and secured to the subfloor. Do not install over perimeter glued floors. Do not install over more than one layer that exceeds 1/8” in thickness.
**Nail/ Staple Down Only** - If old flooring is unsuitable to install new flooring then overlay with new underlayment. Test to conclude that the staples/ cleats are able to properly penetrate and secure the flooring to the subfloor.
**Glue Down Only** – Do not install over more than one layer that exceeds 1/8” in thickness. Clean flooring with an appropriate cleaner and allow to thoroughly dry. If necessary degloss the floor using an abrasive pad to enhance the bonding of the adhesive, if wax or other coatings are present, completely remove the material with a quality stripper, rinse the floor and allow to dry. Always check for proper adhesion bond prior to installing.
**CAUTION: DO NOT SAND** any existing resilient tile, sheet vinyl flooring, or flooring felt as they may contain asbestos fibers that are not readily identifiable. Inhalation of asbestos dust can cause serious bodily harm. Check local, state, and federal laws for handling hazardous material before attempting the removal of these floors.
**Acoustic Cork Underlayment: (Glue Down Only)** – Install the cork underlayment according to the manufacturer’s instructions. The cork underlayment must be fully adhered to the subfloor. The cork underlayment should be of pure granulated cork combined with a polyurethane binder with a minimum density of 11.4 lbs. per cubic foot and not to exceed 13 lbs. per cubic foot.

## PRE INSTALLATION / JOB PREPARATION

**Inspect the Flooring** – Inspect material for color, finish, milling, and grade. Hold out pieces that may not be acceptable once installed.
**PLEASE NOTE: We do not accept responsibility for any costs incurred when plank(s) with visible defects have been permanently installed.**
**Undercut Door Casings** - Undercut all door casings 1/16" higher than the thickness of the flooring being installed. To do this, use a scrap piece of flooring as a guide. Lay it on the substrate and cut the casing with a handsaw or use a power jamb saw set at the correct height.
**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 appearances 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.


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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 ½" regardless of the thickness of the material. For commercial installations use a minimum of ½" expansion.

## GLUE DOWN INSTALLATION GUIDELINES

**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 1/2") 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 sprig nailed into a concrete subfloor.

### Spreading the Adhesive

1. 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 in areas of low humidity and will have a shorter open time in areas of high humidity. (See Adhesive label for further information).

### Installing The Floor

1. 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.
2. 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.
3. 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 to engage the tongue-and-groove. This practice can damage the flooring and/or the finish.
4. Remove the adhesive from the surface of the installed flooring as you work – 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. **DO NOT** use water to remove Urethane adhesives from the finish.
5. 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 space along the end wall. Once the final cuts are made set planks into place.
6. After the floor is complete remove the straight edge and glue down the first two boards.
7. Restrict foot traffic for a minimum of 6-8 hours and wait 24 hours before permitting moving of furniture onto the floor.
8. Clean any wet adhesive from the flooring with a lightly dampened clean cloth. If the adhesive has dried, use mineral spirits on a clean cloth. For Urethane adhesive use the recommended urethane adhesive remover.
9. Roll and cross roll floor with a 100-150 lbs. (45-70 kg) roller at the end of the installation to ensure proper transfer of adhesive.

**Final Inspection:** After the floor has been cleaned, inspect the floor for nicks, scratches, gaps or planks that may have moved during installation, as well as any other imperfections that need attention. Touch up nicks and scratches with touch-up products. In typical climates, the new floor can accept foot traffic within 24 hours. In areas where additional curing time is required, more time may be needed.

## NAIL OR STAPLE DOWN INSTALLATION GUIDELINES

### Additional Tools and Material Needed:

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| **Drill**<br>**Air Hose**<br>**15 lb. Roofers Felt** | **Tapping Block**<br>**In-line Air Regulator** | **Compressor**<br>**Pneumatic Nailer / Stapler** |



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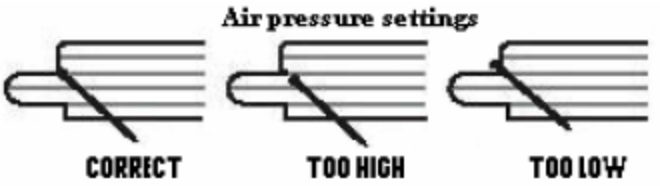
**Before you begin using the following instructions, please refer to the Pre-Installation Job Prep information above.**

**NOTE:** Our products are not warranted against squeaking, popping or crackling when using staple-down or nail-down installation methods. Some squeaking, popping or crackling 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.

**Glue Assist** - For products greater than 5” in width, it is recommended to use a combination glue down assist when using mechanical fasteners. Apply a urethane based wood flooring adhesive to the subfloor prior to installing the planks. Follow the standard fastener schedule. **This installation method doesn’t require the use of a traditional vapor retarder, which enables the glue to adhere to the subfloor rather than the paper.*

**Set Up and Use of Pneumatic Staplers and Nailers**

Minor occasional noises within the flooring are inherent to 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 crackling 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 crackling 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 stapler/ 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 should 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.




**IMPORTANT NOTE: Only use manufacturer's recommended staples or cleats.**
**For 3/8” thick products the minimum length staple/ cleat is 1”**
**For 1/2” thick products the minimum length staple/cleat is 1 ¼”**
**For 9/16” thick products use a minimum length 1 ½” staple/cleat**
**For 3/4" thick products use a minimum 1 ½” length staple/cleat**

Read and follow the manufacturer's instructions for complete set-up and operation of equipment.

**Getting Started**

1. After the subfloor has been properly cleaned and prepped cover the subfloor with 15lb. asphalt felt paper. This material will help to keep the floor clean and help to retard moisture from below (there is no complete moisture barrier system for staple or nail-down applications).
2. 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 overall width of the plank (board width + tongue + the space needed (3/8” or ½”) for expansion).
3. Snap a chalk line from these points, parallel to that wall.
4. Install the first row of starter planks along the chalk line/straightedge and secure into position with the tongue facing away from the starter wall (toward you). Drill pilot holes through the face of the plank every 6” (in the dark grain); approximately 1” from the back edge of the board and secure planks with 1” finishing nails. Countersink nails and fill with appropriate colored wood filler – remove excess filler from surface.
5. Blind nail at a 45˚ angle through the tongue 1”-2” from the end joints and every 6” in between along the length of the starter boards (Predrill holes to make this easier). Depending on the width of the flooring it may be necessary to do this for the first few rows prior to using a pneumatic stapler/nailer.
   **NOTE:** Proper alignment is critical. Misaligned starter rows can cause side and end gaps to appear in proceeding rows of flooring.

**Installing the Floor**

1. Continue to install the flooring making sure to nail/staple 1”-2” from the ends and every 3”-4” thereafter.
2. Products that are 9/16" or thicker - nail/staple 1"-2" from the ends and every 6" to 8" thereafter.
3. 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.



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4. 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.
5. 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 place.
6. 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 l" 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. Countersink nails and fill with appropriate colored wood filler – remove excess filler from surface with a clean rag and proper cleaner.

## FLOATING FLOOR INSTALLATION GUIDELINES

### (Products 3" or wider only)

### Additional tools & material needed:

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| **Floating Floor Adhesive** | **Clean Green™ Hardwood** |
| **Shaw T&G Adhesive** | **Floor Cleaner / Shaw R2X** |
| **Terry Cloth Towels** | **6 Mil Poly Plastic Sheeting** |
| **Foam underlayment** | **Tapping Block & Spacers** |
| **Pry/Pull Bar** | **2in1 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.
- ½" of expansion space required at all vertical surfaces.
- **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.
4. Snap a chalk line using a (brightly colored chalk) from these points.
5. 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 in 1 underlayment may be used. Follow manufacturer's instructions for application installing the 2 in 1 underlayment.**
6. Prior to installing the flooring, secure a straight edge (starter board) 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. This is temporary and will be replaced as the floor is completed.

### Installing the Floor

1. Insert spacers at walls to maintain the expansion space between the flooring and the wall.
2. Before starting to glue planks, dry lay the first two rows of flooring. Working from right to left, install planks so that the groove faces the straight edge (starter board). When reaching the end of the first row, cut the plank as necessary to fit. On the first 4 rows stagger end joints a minimum of 16" and then 8" thereafter.
3. Use the remainder of the plank from the first row to start the second row. If the piece is less than 8" long, cut a new plank in half and use that piece to start the second row.
4. Lay the remainder of the 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.
5. Begin gluing the boards; Run a continuous bead of adhesive 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.
6. Install first row of planks with groove 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 excessive adhesive with a clean, slightly dampened cloth.
   **CAUTION:** Adhesive that is allowed to dry on the finish surface can be difficult to remove and may leave a haze.
7. At the end wall use an end pry bar, if needed, to pull the ends of the planks tight.
8. Continue to install the floor working right to left, repeating the process until the completion of the floor. Continue to use the spacers on all vertical surfaces to maintain the ½" expansion.
   **DO NOT USE** laminate straps as they may damage the flooring



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9. The last row will most likely require cutting to width but it should be no less than 1 ½" wide. To do this, lay the plank face up on top of the last full row installed. Trace the wall contour on the last plank using a scrap piece of plank and a pencil.
10. Install cut planks and pull into place with a pry bar. Install spacing wedges between planks and wall.
11. Remove the straight edge (starter row) and install the last row using the pry bar. Allow floor to dry for a minimum of 12 hours before removing all spacing wedges and allowing foot traffic.
12. Install trim and moldings the following day.

## RADIANT HEATED SUBFLOORS

**Prior to installation of flooring over radiant heat system it is important that the guidelines are followed in strict accordance. Failure to follow the guidelines may produce unsatisfactory results.**

- **Floating installation method only, direct glue down is NOT recommended.**
- **Sub floor must be flat to 3/16" in 10' or 1/8" in 6'**
- **Prior to installation moisture testing must be conducted and documented per ASTM test method 1869-89 for concrete or using a pin type meter for wood sub floors.**
- **The moisture content for concrete sub floors registered after a calcium chloride test must not be greater than 2 pounds per 1000 square feet of area. If it exceeds these limits, DO NOT install the flooring.**
- **Relative humidity of the jobsite must be maintained between 35-55% relative humidity. Use of humidification system may be required to maintain the proper humidity level. Failure to maintain proper humidity level can result in excessive dryness of flooring.**
- **It is highly recommended that the radiant heat system be designed specifically to accept a wood floor.**
- **Use of an in floor temperature sensor as well as a separate thermostat for the individual room is required.**
- **An outdoor temperature sensor should be used to adjust water temperature according to anticipated heat loss.**

### Jobsite Requirements

Prior to installation of flooring the radiant system must be installed per manufacturer's instructions.
Before installation of flooring material the follow conditions are required:

1. Moisture content of concrete must not exceed 2.0 lbs. per CaCl test method (ASTM1869-89) Wood sub floors not to exceed 12% and be within 4% of the wood flooring.
2. Concrete must be allowed to properly cure and dry a minimum of 4 weeks prior to operation of radiant heat system
3. Operation of radiant heat system should be set to run at 2/3 maximum output for a minimum of 2 weeks prior to installation of flooring to further allow moisture from concrete to dissipate and reach a final moisture content. This must be done in both heating and non-heating seasons.
4. Prior to installation (4 days) reduce to a temperature of 65˚.
5. Floating Installation - Install flooring according to floating floor installation guidelines. Use of a 2 in 1 underlayment is required.
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 -i.e. – 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 lowadhesion 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.



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- **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.

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