

ENGINEERED HARDWOOD – INSTALLATION INSTRUCTIONS

FOR STAPLE-DOWN, MECHANICALLY FASTENED, FLOATING AND GLUE-DOWN APPLICATIONS

Please read all the instructions before you begin the installation. Improper installation will void the warranty.

BEFORE YOU BEGIN:

Beautiful hardwood floors are a product of nature and, therefore, not perfect. Our hardwood floors are manufactured in accordance with accepted industry standards. If properly installed and cared for, your new flooring will be easy to maintain and look great for years.

For optimum performing hardwood flooring, carefully read and follow these installation instructions, which are based on industry standards and best practices. Failure to follow these installation instructions may result in damage to the flooring and void the floor's warranty.

1. Owner/Installer Responsibility
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4. Installing the Floor
 - a. Floating Installation
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For additional information not listed below, please refer to the NWFA guidelines <https://nwfa.org/technical-guidelines/>

1. OWNER / INSTALLER RESPONSIBILITY

- These hardwood floors were manufactured in accordance with accepted industry standards, which permit grading deficiencies not to exceed 5%. These grading deficiencies may be of a manufacturing or natural type. When flooring is ordered, 5% must be added to the actual square footage needed for cutting and grading allowance (10% for diagonal installations).
- The owner/installer has final inspection responsibility as to grade, manufacture, and factory finish. Inspection of all flooring should be done prior to installation. The flooring should also be carefully examined for colour, finish and quality before installing it.
- The installer must use reasonable selectivity and not use or cut off pieces with deficiencies, whatever the cause. Should an individual piece be doubtful as to grade, manufacture or factory finish, the installer should not use that piece. If material is not acceptable, do not install it and contact the seller immediately.
- Prior to installation of any hardwood flooring product, the owner/installer must determine that the job-site environment and the sub-surfaces involved meet or exceed all applicable

standards. Recommendations of the construction and materials industries, as well as local codes, should be followed. These instructions recommend that the construction and subfloor be clean, dry, stiff, structurally sound, and flat. The manufacturer declines any responsibility for job failure resulting from, or associated with, subfloor and substrates or job-site environmental deficiencies.

- Use of stain, filler or putty stick for touch-up and appropriate products for correcting subfloor voids is accepted as part of normal installation procedures.

<p>ATTENTION INSTALLERS</p> <p>⚠ CAUTION: WOOD DUST</p> <p>SAWING, SANDING AND MACHINING WOOD PRODUCTS CAN PRODUCE WOOD DUST. AIRBORNE WOOD DUST CAN CAUSE RESPIRATORY, EYE AND SKIN IRRITATION. THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC) HAS CLASSIFIED WOOD DUST AS A NASAL CARCINOGEN IN HUMANS.</p> <p>Precautionary Measures: If power tools are used, they should be equipped with a dust collector. If high dust levels are encountered, use an appropriate NIOSH-designated dust mask. Avoid dust contact with eye and skin.</p> <p>First Aid Measures in Case of Irritation: In case of irritation, flush eyes or skin with water for at least 15 minutes. If you have any technical or installation questions, or to request a Safety Data Sheet, please call 1 866 243 2726 or visit our technical website at www.hardwoodexpert.aHFproducts.com.</p>	<p>WARNING: EXISTING IN-PLACE RESILIENT FLOOR COVERING AND ASPHALTIC ADHESIVES. DO NOT SAND, DRY SWEEP, DRY SCRAPE, DRILL, SAW, BEADBLAST, OR MECHANICALLY CHIP OR PULVERIZE EXISTING RESILIENT FLOORING, BACKING, LINING FELT, ASPHALTIC "CUTBACK" ADHESIVE, OR OTHER ADHESIVE.</p> <p>These existing in-place products may contain 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 existing in-place product is a non-asbestos-containing material, you must presume it contains asbestos. Regulations may require that the material be tested to determine asbestos content and may govern removal and disposal of material. See current edition of the Resilient Floor Covering Institute (RFCI) publication <i>Recommended Work Practices for Removal of Resilient Floor Coverings</i> for instructions on removing all resilient floor covering structures or contact your retailer or AHF Products at 1 866-243-2726.</p> <p>AHF floor coverings and adhesives do NOT contain asbestos.</p>
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2. PREPARATION

2A. STORAGE AND HANDLING

- Handle and unload with care. Store in a dry place being sure to provide at least a four-inch air space under cartons which are stored upon “on-grade” concrete floors. Flooring should not be delivered until the building has been enclosed with windows doors are in place, and cement work, plastering and all other “wet” work is completed and dry.
- Although it is not necessary to acclimate engineered flooring it is best to store it in the environment in which it is expected to perform prior to installation. Check adhesive label for adhesive storage limitations.

2B. JOB-SITE CONDITIONS

- The building should be enclosed with all outside doors and windows in place. All concrete, masonry, framing members, drywall, paint, and other “wet” work should be thoroughly dry. The wall coverings should be in place and the painting completed, except for the final coat on the base molding. When possible, delay installation of base molding until flooring installation is complete. Basements and crawl spaces must be dry and well ventilated.
- Exterior grading should be complete with surface drainage, offering a minimum drop of 3” in 10’ (7.6 cm in 3.05 m) to direct flow of water away from the structure. All gutters and downspouts should be in place.
- Engineered flooring may be installed below, on or above-grade level. Do not install in full bathrooms.
- Crawl spaces must be a minimum of 18” (46 cm) from the ground to the underside of the joists. A ground cover of 6-20 mil black polyethylene film is essential as a vapor barrier with joints lapped 6” (15 cm) and sealed with moisture resistant tape. The crawl space should have perimeter venting equal to a minimum of 1.5% of the crawl space square footage. These vents should be properly located to foster cross ventilation (**Figure 1**).
- Where necessary, local regulations prevail.
- The installation site should have a consistent room temperature of 60-80°F (16-27°C) and humidity

of 30-50% for 14 days prior to and during installation and until occupied.

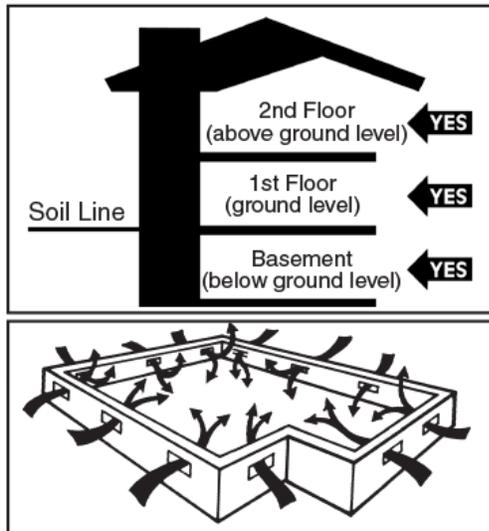


Figure 1

3. SUBFLOOR/UNDERLAYMENT CONDITIONS & REQUIREMENTS

3A. SUBFLOOR CONDITIONS

- **CLEAN** – Subfloor must be free of wax, paint, oil, sealers, adhesives, and other debris.
- **LEVEL / FLAT** – Subfloor must be within 3/16" in 10' (5 mm in 3 m) and/or 1/8" in 6' (3 mm in 2 m). Sand high areas or joints. If the floor is to be glued down, fill low areas with a latex additive cementitious leveling compound of 3,000-PSI minimum compressive strength Patch, Underlayment & Embossing Leveler with Underlayment Additive. Follow the instructions of the leveling compound manufacturer but make certain the levelling compounds are completely DRY before beginning installation. When mechanically fastening the floor down, flatten low spots with a maximum of 6 layers of 15# builders felt, plywood or shims (not leveling compounds). Levelling materials must provide a structurally sound subfloor that does not affect the holding power of the fastener.
- **DRY** – Check and document the moisture content of the subfloor using the appropriate moisture test. Concrete subfloors must be a minimum of 30 days old before testing begins.
- **STRUCTURALLY SOUND** – Any loose areas or squeaks must be nailed or screwed. Wood panels should exhibit an adequate fastening pattern, glued/screwed, or nailed as system requires, using an acceptable nailing pattern. Typical: 6" (15 cm) along bearing edges and 12" (31 cm) along intermediate supports. Flatten edge swell as necessary. Replace any water-damaged, swollen, or delaminated subflooring or underlayments.
- Subfloors with excessive vertical movement should be avoided. Optimum performance of hardwood floor covering products occurs when there is little horizontal or vertical movement of the subfloor. If the subfloor has excessive vertical movement (deflection) before installation of the flooring, it will likely do so after installation of the flooring is complete.

3B. SUBFLOORS WITH RADIANT HEAT

- **NOTE:** Always make certain the product selected is recommended for this type of application. System must be operational and heated for at least 7 days prior to beginning the installation.
- Use an incremental control strategy that brings the floor through temperature changes gradually which may include an external thermostat.
- Turn off heat and let subfloor cool down to room temperature 3-4 hours prior to starting the job.
- **BEFORE** installation begins, ascertain that the heating system is designed and controlled for wood flooring and that the circuit does not include other floor covering types. Failure to do so may cause excessive heat damage and shrinkage. **NOTE:** Refer to radiant heat system manufacturer's precautions for staple down installation. Beware of stapling through radiant tubing or mesh.
- After installation, turn the heating system back on immediately. The finished floor surface must not exceed 85°F (29°C) throughout the life of the floor.
- Radiant heating systems normally create dry heat that can lower interior humidity levels. It may be necessary to add humidity with humidifiers to maintain the recommended levels (30-50%) and prevent damage to the wood floor.
- The flooring should be end-glued over radiant heat to reduce longitudinal shrinkage. Apply a bead of the recommended wood glue to the groove end then insert the tongue. Wipe excess adhesive away immediately.

3C. SUBFLOOR REQUIREMENTS:

Concrete (Glue-Down and Floating Installations Only)

The flooring can be glued directly to concrete with a minimum compressive strength of 3000 PSI. Do not install over a concrete sealer or painted concrete. If present, sealer or paint must be removed by grinding or sanding. Do not install over slick, heavily troweled or burnished concrete. The surface must be roughened as necessary by sanding or grinding. Use an appropriate NIOSH-designated dust mask. Floating floors can be installed over any structurally sound concrete.

Concrete Moisture Tests

All concrete subfloors should be tested, and results documented, for moisture content. Visual checks may not be reliable. Test several areas, especially near exterior walls and walls containing plumbing. Acceptable test methods for subfloor moisture content include:

- Tramex Concrete Moisture Encounter Meter (**Figure 2**): Moisture readings should not exceed 4.5 on the upper scale. (**Figure 2** shows an unacceptable reading of over 4.5) Concrete Moisture Meters give qualitative reading results-not quantitative ones. These results are a quick way to determine if further testing is required.

NOTE: The following tests are required in residential/commercial applications. Either or both tests are acceptable. If both tests are conducted then both tests must pass.

- Calcium Chloride Test (ASTM F 1869): The maximum moisture transfer must not exceed 3 lbs./1000 ft.² in 24 hours with this test.
- RH Levels in Concrete Using In-situ Probes (ASTM F 2170) should not exceed 75%. "DRY" CONCRETE, AS DEFINED BY THESE TESTS, CAN BE WET AT OTHER TIMES OF THE YEAR. THESE TESTS DO NOT GUARANTEE A DRY SLAB.



Figure 2

Acoustic Concrete (Glue-Down or Floating Installations Only)

Acoustic concrete normally contains large quantities of gypsum that may inhibit the adhesive's capability to properly bond. Acoustic concrete must be primed with the concrete manufacturer's recommended primer/surface hardener. Test the concrete by scraping the surface with a nail or other sharp object. If the concrete powders or crumbles, it is not sound, only floating installation should be used. The concrete must have a minimum compressive strength of 3000 PSI.

Ceramic, Terrazzo, Slate & Marble (Glue-Down or Floating Installations Only)

All grout joints and broken corners that exceed 3/16" (5 mm) must be filled with a cementitious leveling compound Patch, Underlayment & Embossing Leveler with Underlayment Additive. The surface must be cleaned and abraded to create a good bonding surface for the adhesive. Loose tiles must be re-adhered to the subfloor or filled as above. All sealers and surface treatments must be removed. Always check for adequate adhesive bond.

Acoustic Cork Underlayment (Glue-Down or Floating Installations Only)

The flooring must be glued or floated directly over full-spread, permanently bonded acoustic cork. The cork must have a density of no less than 11.4 lb./cubic foot. The cork, in general, should be pure cork combined with a polyurethane or resin binder. Install cork in accordance with cork manufacturer's recommendations. Always check for adequate adhesive bond. When floating floors over cork DO NOT use foam underlayment.

Wood Subfloors and Underlayment (All Installation Methods)

General: The wood subflooring materials must not exceed 12% moisture content. Using a reliable wood moisture meter, measure moisture content of both the subfloor and the hardwood flooring to determine proper moisture content. The wood subfloor should be checked at various locations throughout the installation approximately 20 readings or more should be taken and documented. The difference between the moisture content of the wood subfloor and the hardwood flooring must not exceed 3%. When installing parallel to the floor joists it may be necessary to stiffen the subfloor system by installing an additional minimum of 3/8" (9.5 mm) approved underlayment. Applicable standards and recommendations of the construction and materials industries must be met or

exceeded.

NOTE: As flooring manufacturers, we are unable to evaluate each engineered system. Spacing and spans, as well as their engineering methods, are the responsibility of the builder, engineer, architect or consumer who is better able to evaluate the expected result based on site-related conditions and performance. The general information provided below describes common, non-engineered joist/subfloor systems. Engineered flooring systems may allow for wider joist spacing and thinner subflooring materials. When wider joist spacing of 19.2" or greater is used at least one of the following options must be used:

Option 1: When wider joist spacing of 19.2" or greater is used, additional plywood subfloor material must be added to reduce movement and deflection.

Option 2: In addition to the use of mechanical fasteners, assisted glue applications must be used. The glue should be a premium-grade urethane adhesive or equivalent. Then follow the recommended fastening pattern.

NOTE: Following one of these options is also intended to reduce noise associated with a mechanically fastened installation.

Wood Structural Panel Subfloors and Underlayment (All Installation Methods)

Structural panels/underlayment must be installed sealed side down. When used as a subfloor, allow 1/8" (3 mm) expansion space must be allowed between each panel. If spacing is inadequate, cut in with a circular saw. Do not cut in expansion space on tongue and groove panels.

- **Plywood:** Must be minimum CDX grade (exposure 1) and meet US Voluntary Product Standard PS1 performance standard or Canadian performance standard CAN/CSA 0325-0-92. The preferred thickness is 3/4" (19 mm) as a subfloor [minimum 5/8" (16 mm)] or 3/8" (9.5 mm) as underlayment.]
- **Oriented Strand Board (OSB):** Conforming to US Voluntary Product Standard PS2 or Canadian performance standard CAN/CSA 0325-0-92 construction sheathing. Check underside of panel for codes. When used as a subfloor, the panels must be tongue and groove and installed sealed side down. Minimum thickness to be 23/32" (18 mm) thick when used as a subfloor or 3/8" (9.5 mm) as underlayment.
- **Waferboard and Chipboard:** Conforming to US Voluntary Product Standard PS2 or Canadian performance standard CAN/CSA 0325-0-92. Must be 3/4" (19 mm) thick when used as a subfloor and 3/8" (9.5 mm) thick when used as an underlayment.
- **Particleboard:** Must be a minimum 40-lb. density, stamped underlayment grade and 3/4" (19 mm) thick.

Solid Wood Subfloors (All Installation Methods)

- Minimum 3/4" (19 mm) thick with a maximum width of 6" (15 cm) installed at a 45° angle to the floor joists.
- The subfloor must be Group 1 dense softwood (Pine, Larch, Douglas Fir, etc.) No. 2 common kiln dried with all board ends bearing on joists.
- For glue-down applications, a 3/8" (9.5 mm) approved underlayment must be added.

Existing Wood Flooring (All Installation Methods)

- Existing engineered flooring must be well bonded/fastened. When gluing over existing wood flooring of any thickness, the finishing materials must be abraded or removed to foster an adequate adhesive bond. When flooring is to be mechanically fastened, the existing engineered wood flooring must be a minimum of 3/8" (9.5 mm) thick installed over approved wood/wood composite underlayment that has been properly fastened. When installing over engineered flooring that is glued to concrete, the minimum thickness of that flooring must be 1/2" (13 mm) to allow for the length of the fastener.
- Existing solid wood flooring that exceeds 6" (15 mm) in width must be covered with 3/8" (9.5 mm) approved underlayment and fastened as required. Do not install over solid flooring attached directly to the concrete.

Vinyl, Resilient Tile, Cork Flooring and Linoleum (Glue-Down Installations)

- Make certain the floor covering materials are well bonded to the subfloor/underlayment with full-spread adhesive and are no more than two layers thick, not to exceed 3/16" (5 mm).
- With approved wood/wood composite subfloors, if vinyl or tiles are loose, broken, or in poor condition, install a 3/8" (9.5 mm) approved underlayment directly over the flooring materials.
- Clean the flooring materials as necessary to create a good adhesive bond. If a maintenance material is present on the floor covering or a gloss is present, de-gloss with a flooring pad and a commercially available stripper, then rinse completely. Allow ample drying time. (**NOTE:** Do not sand any resilient products. They may contain asbestos fibres, which may be harmful.)
- Cork floors must have all sealers and surface treatments removed before installation begins. Always check for an adequate adhesive bond.

(Mechanically Fastened/Staple-Down Installations)

- Do not install over floors that exceed one layer, as the thickness of the flooring materials will prevent an adequate mechanical bond.
- Make certain that the subflooring materials meet minimum requirements. (See previous sections).
- Some tile products may be too brittle for staple penetration. Always test an area for breakage before proceeding.

4. Installing the Floor

General Installation Tips:

- All products may be stapled or mechanically fastened, but products over 5" will require the supplement of a premium moisture-cured urethane adhesive or equivalent.
- Floor should be installed from several cartons at the same time to ensure good colour and shade mixture.
- When possible, preselect and set aside boards that blend best with all horizontally mounted mouldings used to ensure a uniform final appearance. Install these boards adjoining the mouldings.
- Be attentive to staggering the ends of the boards at least 4"-6" (10-15 cm) when possible, in adjacent rows (**Figure 3**). This will help ensure a more favourable overall appearance of the floor.

- When installing engineered products of uniform length, begin the rows with starter boards cut to various lengths. Avoid staggering the rows uniformly to prevent stair-stepping. Boards cut from the opposite end of the row may be used for the next starter boards.
- Always allow a minimum 1/4" (6 mm) expansion around all vertical obstructions. Allow 1/2" (13 mm) for floating floors.

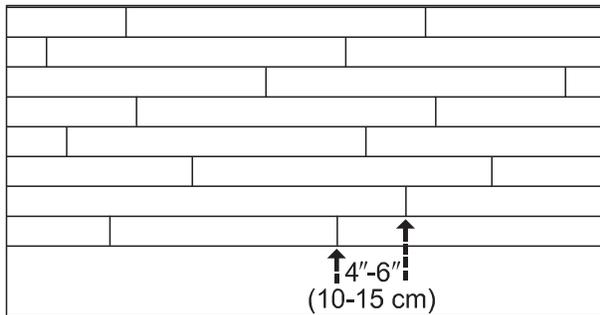


Figure 3 – Preferred Alignment

4A. Floating Installation

Tools and Accessories

Broom	Tape Measure	Hammer	Chalk Line & Chalk
Hand Saw or Jamb Saw	Recommended Hardwood Flooring Cleaner	Electric Power Saw	Eye Protection
Moisture Meter (Wood / Concrete or both)	Transition and Wall Mouldings	NIOSH-Designated Dust Mask	Premium Underlayment for Floating Hardwood Flooring
Pull Bar	Tapping Block		

Recommended Subfloor/Underlayment Surfaces:

Wood Subfloors	Wood Structural Panels and Underlayment	Fully Adhered Existing Wood Floors	Fully Adhered Non-Cushion Vinyl Sheet
Resilient Tile	Cork Flooring and Linoleum	Concrete	Ceramic Tile, Terrazzo, Slate & Marble
Acoustic Cork			
<i>(Please refer to pages 3 to 6 for subfloor conditions and requirements)</i>			

General Information for Floating Floors

Richmond engineered hardwood planks are designed to be installed using a floating method by gluing the tongue and groove on the side joint and end joint using a PVA T&G adhesive (e.g., D3 or Titebond T&G flooring adhesive). Before installation using the floating method, install an approved underlay. Please note that all cement subfloors and screeds require an approved moisture barrier (i.e., age resistant PE film, min. 0.20 mm (8 mil) thickness. Overlap edges a minimum 20 cm (8") and tape seams. Approved underlay materials include 2 mm cork, high-density foams (over 30 kg/m³) with a maximum thickness of 2mm. The underlay should be butted side-by-side with no overlap. Tape seams together.

Leave an open expansion gap of minimum 1/2" (13mm) around the entire perimeter (use spacers). Also leave expansion gap of minimum 1/2" (13mm) around pipes, stairs, columns, doorframes and thresholds. In large rooms, a larger expansion space may be required. Install maximum 10m (32 In ft) length or width without an expansion space. If installing a distance greater than 10m (32 In ft), we recommend gluing or stapling the floor. If floating, the floor requires an expansion gap at 32 ft. The gap must be covered with a T-moulding or similar profile.

Floating floors must be able to move freely throughout the installed area. Do not pin under cabinets or islands. Do not connect or install tight to any construction member. An expansion space is required in all door openings. Similarly, rooms with off square areas, for example L, F, T, or U-shapes, require that the separate areas be allowed to expand and contract independently by installing an expansion space between these areas. If you have any further installation questions, contact your retailer.

STEP 1: Doorway and Wall Preparation

- Undercut door casings and jambs. Remove any existing base, shoe moulding or doorway thresholds. These items can be replaced after installation. All door casings and jambs should be undercut to avoid difficult scribe cuts (**Figure 4**).

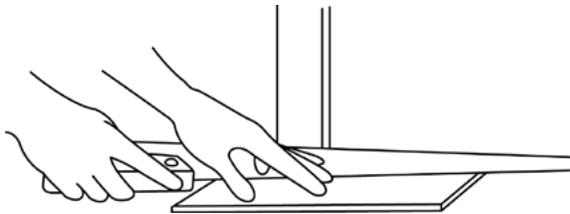


Figure 4

STEP 2: Establish a Starting Point

- Installation parallel to the longest wall is recommended for best visual effects, however, the floor should be installed perpendicular to the flooring joists unless the subfloor has been reinforced to reduce subfloor sagging.
- When possible, begin the layout or installation from the straightest wall, generally an outside wall.
- In at least two places, at least 18" (46 cm) from the corner, measure out equal distance from the starting wall (**Figure 5**) and snap a chalk line. The measurement must be the sum of the width of the flooring plus an additional 3/8" (9.5 mm) to allow for 1/4" (6 mm) expansion space and the width of the tongue. Allow 1/2" (13 mm) expansion when installing floating floors.

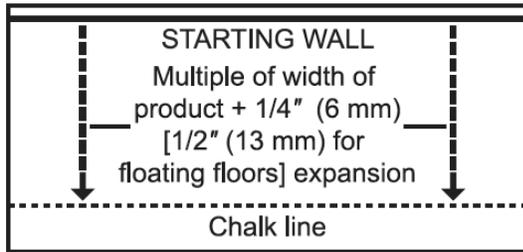


Figure 5

STEP 3: Installing the Underlayment

- Install the underlayment in the same direction the hardwood flooring is to be installed.
- Extend the underlayment a few inches up the wall.
- Trim excess prior to installing trim or moldings.
- The floating floor underlayment already has double-sided tape for ease of taping the precut overlapping seams (**Figure 12**). If a non-adhesive underlayment is used butt and tape all seams.

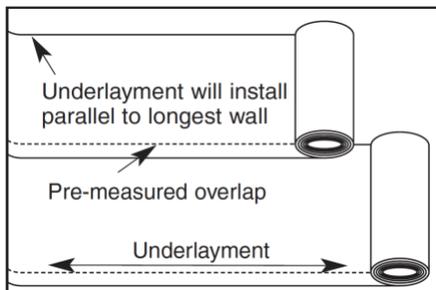


Figure 12

STEP 4: Installing the Floor

- The first row can be installed using one of two methods after the layout has been completed (Step 2). Allow 1/2" (13 mm) expansion.
- If the wall is not straight, scribe the first board (**Figure 13**) as necessary to maintain alignment with the chalk line. Install a sacrificial board (with a straight edge) using the appropriate fasteners for the subfloor. If a board is used for the starter row, make certain the groove faces the wall.
- Align the first row with the wall using wedges to maintain a 1/2" (13 mm) expansion in place and to stabilize the product. If the wall is not straight, scribe the first board (**Figure 13**) as necessary to maintain alignment with the chalk line.

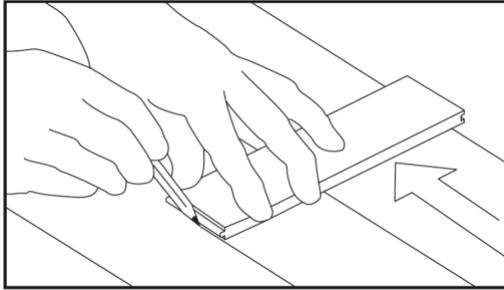


Figure 13

- Select the first board. All installations should begin with the groove side against the wall using the longest boards available. Apply a continuous 1/8" (3 mm) glue bead to the inside bottom of the groove on the end of the board. Do not apply glue to the groove side at this time (**Item C, Figure 14**). Products with the end tongue on the left should be installed right to left, opposite tongues should be left to right. (**Item D, Figure 14**). If a sacrificial board was used remove it **DO NOT** glue the first row to it.
- Complete the first row. Cut the last board allowing for 1/2" (13 mm) clearance between the wall and the floor. (Use the remaining end of the cut board as a starter board for any row following row three). Install a wedge on the end of the board between the hardwood flooring and the wall, allowing 1/2" (13 mm) expansion space. Avoid installation of any boards shorter than 16" (40.6 cm) in the first four rows. (**Item F, Figure 14**).
- Use a pull bar to pull the last board into place from the opposite end. Install wedges into the gap and tighten (**Item B, Figure 14**).
- If any glue gets on the surface of the flooring, wipe off immediately with a clean damp cloth.
- Cut or use a shorter board for the first board of the second row. Start the second row by applying a 1/8" (3 mm) bead along the inside bottom of the end and side groove of the new board. Install the first board of row two. Apply a bead of glue to the inside bottom of the end and side groove of the next board and install. When installing boards together, use a tapping block against the tongue, not the groove (**Item G, Figure 14**). Tap the boards into place by tapping with a hammer on the tapping block. **DO NOT** tap on the edge directly with the hammer. Complete the second through fourth rows using this technique. Insert wedges on the ends, as necessary, to restrain the movement of the floor.
- In the remaining rows, stagger joints 4"-6" (10-15 cm) apart. Install the rest of the floor. Be sure all joints are tight. Use spacers on the long and butt walls. Use a tapping bar to tighten the joints from the ends.

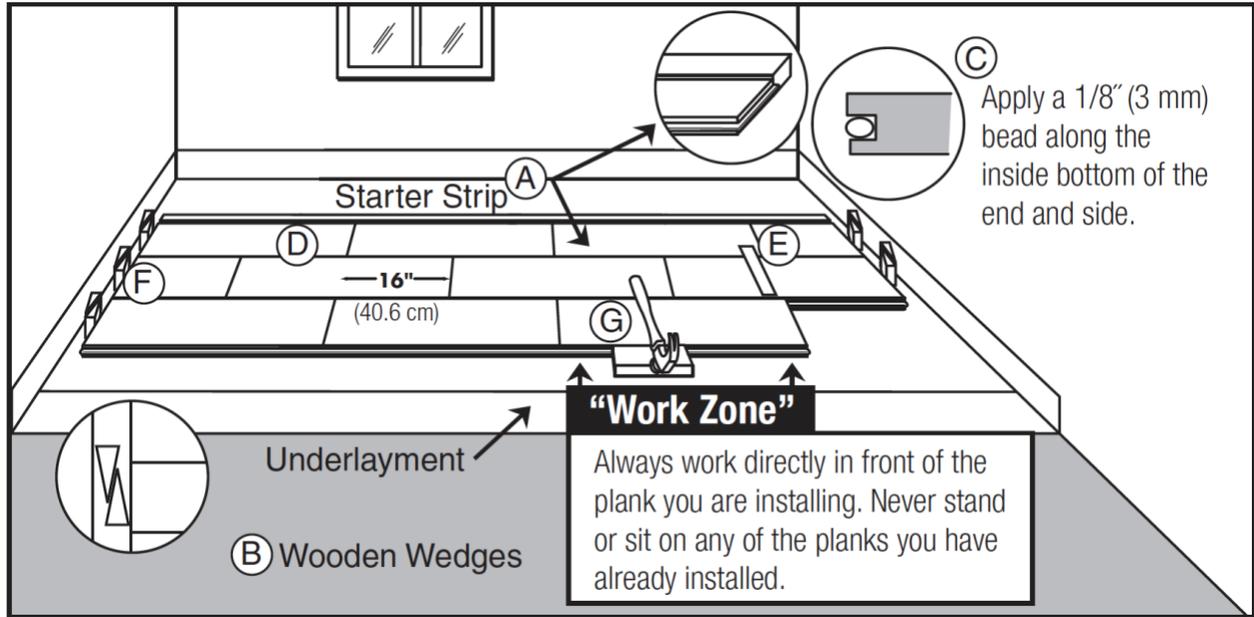


Figure 14

STEP 5: Completing the Installation (See page 19)

4B. Mechanically Fastened/Staple-Down Installations

Tools and Accessories

Broom	Tape Measure	Hammer	Chalk Line & Chalk
Hand Saw or Jamb Saw	Recommended Hardwood Flooring Cleaner	Electric Power Saw	Eye Protection
Recommended Wood Glue	Moisture Meter (Wood / Concrete or both)	Transition and Wall Mouldings	NIOSH-Designated Dust Mask
PowerNail®, Primatech®, High ProStanley Bostitch®, Senco®			
1" Staples/fasteners (minimum) for 3/8" – 1/2" products, for 9/16" products, 1-1/4" fastener			
For 3/4" use an 18 gauge 1-1/4" staple or longer with a 1/4" crown			
20 Gauge Fasteners	Compressor and Hose	Nylon/Plastic Tapping Block	In-line Regulator
Premium moisture cured urethane adhesive or equivalent for floors exceeding 5" in width			

Recommended Subfloor/Underlayment Surfaces:

Wood Subfloors	Wood Structural Panels and Underlayment	Fully Adhered Existing Wood Floors	Fully Adhered Non-Cushion Vinyl Sheet
Resilient Tile	Cork Flooring and Linoleum	Concrete	Ceramic Tile, Terrazzo, Slate & Marble
Acoustic Cork			
<i>(Please refer to pages 3 to 6 for subfloor conditions and requirements)</i>			

General Information for Mechanically Fastened/Staple-Down Installations

NOTE: FOR PRODUCTS WIDER THAN 5”: In addition to the use of mechanical fasteners, assisted glue applications should be used. Without the supplement of adhesive, nail-down installations of wide plank flooring may result in board movement. Noises that emanate from installed flooring are not considered to be a manufacturing defect. These noises are always related to movement caused by insufficient fastening, un-level subfloors, or pressure related to lack of expansion space.

Adhesives used in the glue-assist method may be trowelled or laid down in a bead using a cartridge or sausage adhesive. Follow the adhesive manufacturer’s general guidelines, then follow the recommended fastening pattern.

If using the trowel method, spread rows of adhesive perpendicular to the plank direction, no more than 12” apart. If laying down a bead of adhesive, apply the bead in a serpentine pattern, directly onto the subfloor or to the back of the planks, in the direction of the planks (**Figure 7**).

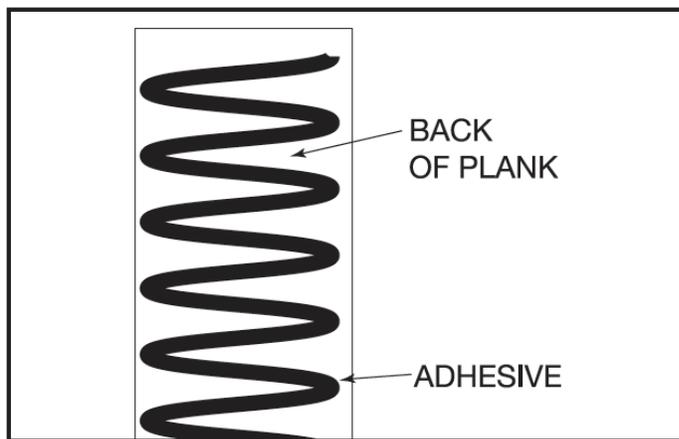


Figure 7

Recommended Adhesive:

Trowel Method: Moisture Cured Urethane (e.g. Bostik Best, or equivalent), **Bead method:** Bona R850T (or equivalent) Do not use PL Premium or similar construction adhesives. The adhesive must remain flexible to allow normal expansion and contraction of the wood flooring. Be sure to follow adhesive manufacturers

cleaning guidelines as adhesive that cures on the flooring surface will be difficult to remove.

STEP 1: Doorway and Wall Preparation

- Undercut door casings and jambs. Remove any existing base, shoe molding or doorway thresholds. These items can be replaced after installation. All door casings and jambs should be undercut to avoid difficult scribe cuts (**Figure 4**).

STEP 2: Establish a Starting Point

- Installation parallel to the longest wall is recommended for best visual effects, however, the floor should be installed perpendicular to the flooring joists unless the subfloor has been reinforced to reduce subfloor sagging.
- When possible, begin the layout or installation from the straightest wall, generally an outside wall.
- In at least two places, at least 18" (46 cm) from the corner, measure out equal distance from the starting wall (**Figure 5**) and snap a chalk line. The measurement must be the sum of the width of the flooring plus an additional 3/8" (9.5 mm) to allow for 1/4" (6 mm) expansion space and the width of the tongue.

STEP 3: Installing First and Second Rows

- Use the longest, straightest boards available for the first two rows. Align tongue of first row on chalk line. The groove should be facing the starting wall. Pre-drill 1/2" (13 mm) from back (groove) edge, 1"-2" (2.5-5 cm) from each end, and at 6" (15 cm) intervals when possible (**Figure 6**). Fasten using 4 or 6d finishing nails or 1" (2.5 cm) pneumatic finish nails/brads. Countersink the nails.

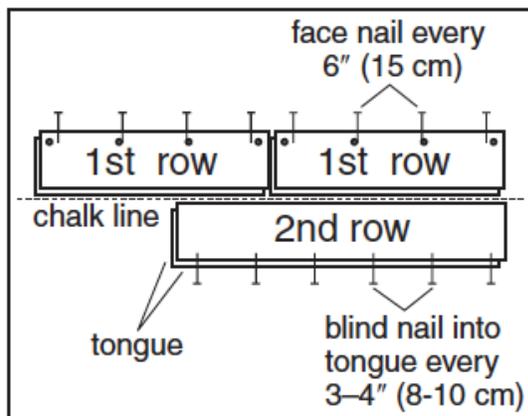


Figure 6

- Pre-drill and blind-nail at a 45° angle through the tongue of the first row every 1"-2" (2.5-5 cm) from the ends and spaced in 3"-4" (7.6-10 cm) intervals. Countersink nails to ensure flush engagement of groove with the following row(s). Continue blind nailing using this method with following rows until stapler can be used. Alternatively, use a pneumatic finish nailer and install nails/brads at the same intervals with a minimum length of 1" (2.5 cm).
- End-joints of adjacent rows should be staggered a minimum of 4"-6" (10-15 cm) when possible, to ensure a more favorable overall appearance (**Figure 3**).

STEP 4: Installing the Floor

- Always use the correct stapler for the specific product being installed (see “**Installation Applications**”). Use a minimum 1” (2.5 cm) staple recommended by the stapler manufacturer for 3/8” to 1/2” products and a minimum 1-1/4” fastener for 9/16” products. For 3/4” use an 18 gauge 1-1/4” staple or longer with a 1/4” crown 1”-2” (2.5-5 cm) from the ends spaced at 3”-4” (8-10 cm) intervals.
- Set compressor at 70 PSI. If tongue damage occurs, lower air pressure (**Figure 8**).
- Fasten several sacrificial boards to the floor. At least two boards, stapled side by side, must be used to indicate proper machine adjustments.
- Check for surface damage, air pressure setting, tongue damage, edge blistering, etc. before proceeding. Make all adjustments and corrections before installation begins. Once proper adjustments have been made, remove and destroy the boards.
- Install the remainder of the floor working from several cartons.
- The last 1-2 rows will need to be face-nailed when clearance does not permit blind nailing with a stapler or a brad nailer. Pre-drill and face-nail or pneumatically nail on the tongue side, following the nailing pattern used for the first row.

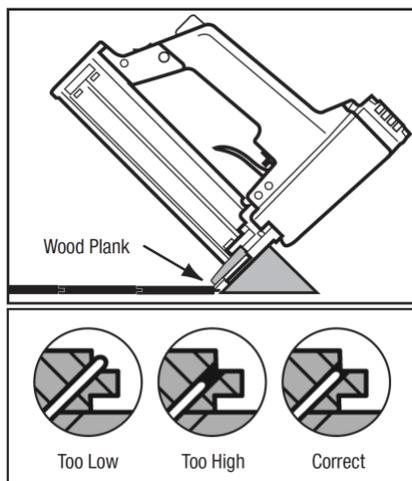


Figure 8

STEP 5: Completing the Installation (see page 19)

4C. Glue-Down Installations:

Tools and Accessories			
Broom	Tape Measure	Hammer	Chalk Line & Chalk
Hand Saw or Jamb Saw	Recommended Hardwood Flooring Cleaner	Electric Power Saw	Eye Protection
Moisture Meter (Wood / Concrete or both)	Transition and Wall Mouldings	NIOSH-Designated Dust Mask	Recommended Adhesive and Adhesive Remover
Recommended Trowel	3M Scotch-Blue™ 2080 Tape		

Recommended Subfloor/Underlayment Surfaces:

Wood Subfloors	Wood Structural Panels and Underlayment	Fully Adhered Existing Wood Floors	Fully Adhered Non-Cushion Vinyl Sheet
Resilient Tile	Cork Flooring and Linoleum	Concrete	Ceramic Tile, Terrazzo, Slate & Marble
Acoustic Cork			
<i>(Please refer to pages 3 to 6 for subfloor conditions and requirements)</i>			

General Information for Glue-Down Installations

- Open times and curing times of ALL adhesives vary dependent upon subfloor porosity, air movement, humidity, and room temperature. Urethane adhesive has a shortened working time in high humidity environments whereas the working time for polymeric resin adhesives will be lengthened. In areas of low humidity, open time will be longer with urethane adhesives and shorter with polymeric resin adhesives. Adjust the amount of adhesive spread on the subfloor accordingly. The adhesive should not be applied if subfloor or room temperature is below 60°F (16°C). **WORKING TIME WILL VARY DEPENDING ON JOB SITE CONDITIONS.**
- Hold trowel at a minimum 45° angle (**Figure 9**) firmly against the subfloor to obtain a 40-60 ft.² (4-5.5 m²) per gallon spread rate. The trowel will leave ridges of adhesive and very little adhesive between the ridges. This method will allow you to see the chalk lines between the ridges still and provide the recommended spread rate.
- For additional application instructions, follow the recommendations on the adhesive container.
- Proper ventilation within the room to mitigate fumes. An electric fan is helpful.
- Rolling is not required, but if desired, do not do so until the adhesive has cured for two hours.

- **NOTE:** DO NOT INSTALL FLOORING USING RUBBER MALLETS. STRIKING THE SURFACE WITH A RUBBER Mallet MAY “BURN” THE FINISH CAUSING IRREPARABLE DAMAGE.

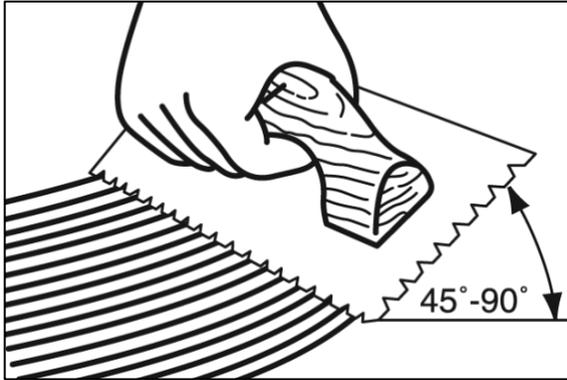


Figure 9

STEP 1: Doorway and Wall Preparation

- Undercut door casings and jambs. Remove any existing base, shoe molding or doorway thresholds. These items can be replaced after installation. All door casings and jambs should be undercut to avoid difficult scribe cuts (**Figure 4**).

STEP 2: Establish a Starting Point

- Installation parallel to the longest wall is recommended for best visual effects, however, the floor should be installed perpendicular to the flooring joists unless the subfloor has been reinforced to reduce subfloor sagging.
- When possible, begin the layout or installation from the straightest wall, generally an outside wall.
- In at least two places, at least 18" (46 cm) from the corner, measure out equal distance from the starting wall (**Figure 5**) and snap a chalk line. The measurement must be the sum of the width of the flooring plus an additional 3/8" (9.5 mm) to allow for 1/4" (6 mm) expansion space and the width of the tongue.

STEP 3: Spread the Adhesive

- Spread sufficient amounts of the recommended adhesive with the recommended trowel in an area that can be covered in 60 minutes (see adhesive information).
- If necessary, nail a sacrificial row with 1" (2.5 cm) nails on the dry side of your chalk line to help hold the first row in place.
- **NOTE:** Avoid installing on the surface of the flooring. If necessary, distribute weight using a kneeler board.

STEP 4: Installing the Floor (Figure 10A-10D)

- Use the longest, straightest boards available for the first two rows. The first row of planks should be installed with the edge of the groove lined up on the chalk line. The tongue should be facing the starting wall. The first row must be aligned and seated in the adhesive, as all additional rows will be pushed back to this original row. Remove tongue to allow for expansion space, if necessary, on the row adjoining the wall.

- When installing pieces, engage the end-joint first, as close to the side (long) tongue and groove as possible, then slide together tightly to engage the side (long) joint tongue and groove. To avoid adhesive bleed-through and memory pull-back, avoid, as much as possible, sliding pieces through the adhesive when placing them in position.
- During the installation, occasionally remove a piece of flooring from the subfloor and inspect the back for proper adhesive transfer. Adequate adhesive transfer is necessary to ensure sufficient holding strength.
- If the adhesive skins over and fails to transfer, remove and spread new adhesive to achieve proper bonding.

NOTE: Clean adhesive from the surface of the floor frequently, using the recommended adhesive cleaner. Urethane adhesives become extremely difficult to remove when cured. Do not use 3M Scotch-Blue™ 2080 Tape before adhesive is removed from the surface. Use clean towels, changed frequently, to prevent haze and adhesive residue.

- Check for a tight fit between all edges and ends of each plank. End joints of adjacent rows should be staggered 4"-6" (10-15 cm) when possible to ensure a more favourable overall appearance (**Figure 3**).
- It may be necessary to align the product with a cut-off piece of scrap as shown (**Figure 11** - Keep scrap angle low to avoid edge damage).

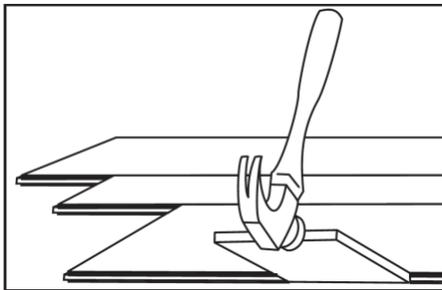


Figure 11

- To eliminate minor shifting or gapping of the product during installation, use 3M Scotch-Blue™ 2080 Tape to hold the planks together. After installation is complete, remove all of the 3M Scotch-Blue™ 2080 Tape from the surface of the newly installed flooring. Do not let the tape remain on the flooring longer than 24 hours. Avoid the use of masking or duct tape, which leaves an adhesive residue and may damage the finish.
- If necessary, use weights to flatten boards with bows until adhesive cures, in order to prevent hollow spots. Boards that cannot be flattened should be cut in length to reduce the bow or should not be used.
- Be sure not to spread adhesive too far ahead of your work area (**Figure 10D**).
- Complete the installation using this same technique for the remainder of the floor.
- Avoid heavy foot traffic on the floor for at least 24 hours. Lift the furniture or fixtures back into place after 24 hours.
- Continue to Step 5.

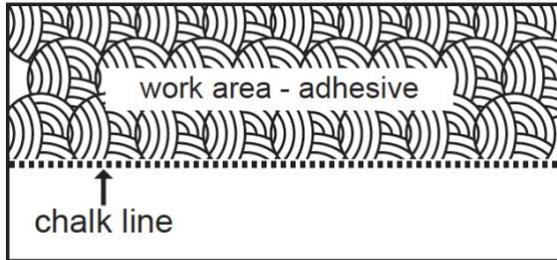


Figure 10A

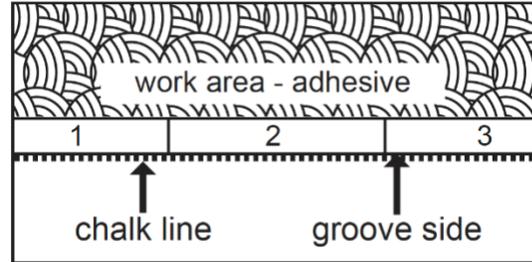


Figure 10B

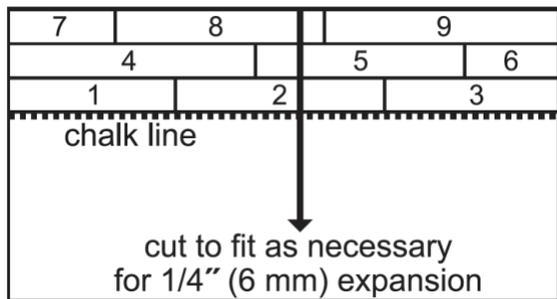


Figure 10C

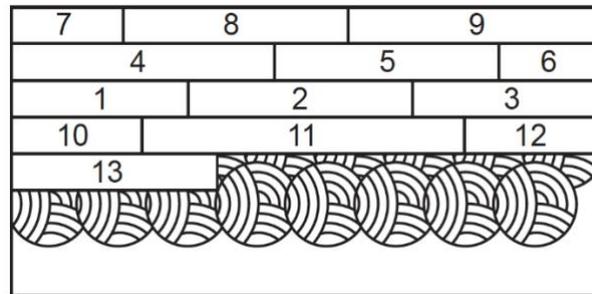


Figure 10D

Step 5: Completing the Installation (all installations)

- Remove all tape and clean the floor with the recommended hardwood flooring cleaner.
- Trim all underlayment (floating only) and install or re-install any transition pieces, reducer strips, T-moldings that may be needed. These products are available pre-finished to blend with your flooring. Nail mouldings into the wall, not the floor.
- Inspect the floor, filling all minor gaps with the appropriate blended filler.
- If the floor is to be covered, use a breathable material such as cardboard. Do not cover with plastic.
- Installers: Leave warranty and floor care information with the owner. Advise them of the product name and code number of the flooring they purchased.
- To prevent surface damage, avoid rolling heavy furniture and appliances on the floor. Use plywood, hardboard or appliance lifts if necessary. Use protective casters/caster cups or felt pads on the legs of furniture to prevent damage to the flooring.

6: CARE & MAINTENANCE

INSTALLERS – ADVISE YOUR CUSTOMER OF THE FOLLOWING:

Seasons: Heating and Non-heating

Recognizing that hardwood floor dimensions will be slightly affected by varying levels of humidity within the structure, care should be taken to control humidity levels and maintain them in the 30-50% range. To protect the flooring and provide lasting satisfaction, the manufacturer's recommendations are below.

- **Heating Season (Dry):** A humidifier is recommended to prevent excessive shrinkage in hardwood floors due to low humidity levels. Wood stoves and electric heat tend to create very dry conditions.
- **Non-Heating Season (Humid, Wet):** Proper humidity levels can be maintained by use of an air conditioner, dehumidifier, or by turning on your heating system periodically during the summer months. Avoid excessive exposure to water from tracking during periods of inclement weather. Do not obstruct in any way the expansion joint around the perimeter of your floor.
- Damage caused by failing to maintain the proper humidity levels is not manufacturing-related and will void the floor's warranty.

NOTE: Final inspection by the end-user should occur from a standing position.

7. FLOOR REPAIR

- Minor damage can be repaired with a touch-up kit or filler. Major damage will require board replacement, which can be done by a professional floor installer. Instructions for the board replacement can be found at richmondflooring.ca.