Engineered Hardwood Flooring Installation Instructions

READ BEFORE INSTALLATION

INSTALLATION WARNING:

Installation conditions – including temperature, sun exposure and humidity – will affect this product's performance over time. For best results, room temperature and humidity of installation area must be kept consistent with normal, year-round living conditions for a minimum of one week prior to installation. All products require a specific temperature range of 60°F to 80°F with 35% to 55% relative humidity. Installation outside of these recommended ranges or over a wet subfloor will likely cause movement in the flooring, including potential shrinkage, tip-raising, gapping between pieces, cupping and face-checking. **Peninsula Flooring (hereinafter "PF") strongly recommends glue-down to be the best method to install its engineered hardwood flooring and PF engineered hardwood flooring MUST be installed according to the National Wood Flooring Association's (NWFA) installation guidelines in order for the Limited Warranties to be valid.** The most current publication of the NWFA guidelines is available to all NWFA members, and can be found at www.nwfa.org (800-422-4556)

INSTALLER'S / OWNERS RESPONSIBILITY

As a natural product, hardwood contains inherent variations in color, grain, appearance and other visual imperfections. PF Engineered Hardwood Flooring is manufactured in accordance with industry standards which permit a defect tolerance not to exceed 5%. These defects may be the result of manufacturing or naturally occurring characteristics of the material. It is recommended additional 5-10% to be added to the total square footage for cutting or grading allowance when calculating the quantity of flooring required. For diagonal flooring installs, please add additional 15% for cutting or grading allowance. It is the sole and joint responsibility of the installer and owner to conduct a quality inspection of all flooring materials prior to installation. All flooring materials should be examined for quality of manufacture, finish and color. If the product quality is deemed unacceptable, the flooring should not be used for installing. Flooring that has

been installed will be deemed to have been inspected and accepted by the installer and owner. **It is the sole responsibility of the flooring installer to ensure the job site, subfloor, installation tolls and materials meet or exceed industry standards. PF highly suggests using a NWFA certified flooring installer or consult the dealer you made your purchase from for an authorized installer.** PF voids all responsibility for any problems arising from incorrect or improper site preparations or installations procedures.

JOBSITE CONDITIONS & PRE-INSTALLATION PLANNING

General Information

- The building must be structurally completed and enclosed. All outside doors and windows must be in place and have latching mechanisms. All concrete, masonry, plastering, drywall and paint must be completed. Allow adequate drying time as to not raise moisture content within the building. All texturing and painting primer coats should be completed.
- HVAC systems must be fully operating at least 14 days prior to flooring installation. Maintain a consistent room temperature between 60-80°F and relative humidity between 35- 55% is recommended and this should remain at this level all year round. This is to stabilize the building's interior environment, but also is essential when acclimating hardwood flooring to the job site. Wood is a hygroscopic material that expands and contracts depending on the relative humidity level of the environment. Flooring must be stored in a climate-controlled area, which is equal to the environment that will be installed 5-7 days prior to the installation. DO NOT OPEN the cartons until you are ready to install.
- Exterior grading, directing drainage away from the structure, as well as gutters and downspouts should be completed. Floors may be installed on, above, or below grade level and are not recommended in full bathrooms.
- It is essential that basements and crawl spaces are well ventilated and dry. Crawl spaces must be minimum of 24" from the ground to underside of joists. A vapor barrier must be established in crawl spaces using 6-mil polyethylene film with joists overlapped and taped.
- During the final pre-installation inspection, Subfloor must be checked for moisture content using the appropriate metering device for the wood and concrete.
- Work out of several different cartons at the same time to obtain the best distribution of color, grain and shade mixture.

- Undercut door casings to avoid difficult scribe cuts, and remove all existing wall base, shoe molding, quarter round or doorway threshold. These items can be replaced after installation but should be replaced in such a way to allow at least ½" room for expansion. Please see NWFA Installation Guideline for details.
- Hardwood flooring will expand and contract with changes in ambient temperature and humidity. Allow floor to expand and contract, during installation leave an ½" expansion space around the entire perimeter of the floor between the flooring and the walls. Also leave an ½" expansion space where the flooring will meet a vertical obstacle, such as stairs, pipes, door sills, tiles, cabinets, etc. In climates with extreme variations in humidity, it may be necessary to leave a larger expansion space.

Subfloor Preparation

The installer and owner are jointly and solely responsible for ensuring that the subfloor is suitable for the flooring application and properly prepared for installation.

Subfloor Conditions

- Clean, free of wax, paint, oil, plaster and debris. All previous or existing glues or adhesives must be removed completely before the start of installation. #3 1/2 grit open coat paper may need to be used to grind a concrete sub-floor. This will loosen any dirt, concrete or contaminates. Sweep or vacuum thoroughly.
- Flat to 3/16" per 8' radius or 1/8" per 6' radius. If a sub-floor prep work is required, "hills" should be sanded down and the "valleys" filled with an underlayment patch. Subfloor irregularities and undulations may cause any wood flooring installation to develop hollow spots between the flooring and sub-floor. These hollow spots are NOT the result of any wood flooring manufacturing defect and are NOT covered under warranty.
- Structurally sound and properly secured with nails or screws every 6" along joists to reduce the possibility of squeaking after installation. Nail or screw any loose areas that squeak or reveal movement and replace any damaged sub-floor or underlayment.
- Dry and should be covered, wall-to-wall, with 15lb asphalt saturated felt. Lap edges of this felt 4" when positioning it. Double the felt around heat ducts in the floor. It is essential that basements and crawl spaces are well ventilated and dry. Crawl spaces must be minimum of 24" from the ground to underside of joists. A vapor barrier must be established in crawl spaces using 6 mil polyethylene film with joists overlapped and taped. ALL sub-floors must be tested for moisture. See below for an appropriate moisture testing.

Acceptable sub-floors

- 5/8” minimum thickness, preferred 3/4”, or thicker exterior plywood installed with long edges at right angle to floor joists and staggered so end joints in adjacent panels break over different joists.
- 1” x 4” to 6” wide, square edged, kiln dried coniferous lumber, laid diagonally over 16” on center wooden joists. The ends of all boards are to be cut parallel to the center of the joists for solid bearing.
- 3/4” inch minimum O.S.B. on 19.2” center floor joists system properly nailed. When joist space is greater than 19.2”, flooring may exhibit minimum performance. Adequate and proper nailing as well as soundness of the sub-floor should be ascertained.
- Concrete sub-floors must be at least 60 days old, clean, level, sound and of sufficient compression strength (3000 lbs. P.S.I.) being sure that the surface is not slick. Any sections not leveled such as waviness, trowel marks, etc. are to be eliminated by grinding or the use of a leveling compound.
- Appropriate moisture test must be done prior to installation – Always document your readings.

Wood Subfloors

Plywood sub-floors must meet local building code requirements. They must be secure to the joists, free of squeaks and protruding fasteners. Check the moisture content of both sub-floor and hardwood flooring with a quality calibrated pin moisture. Wood sub-floor moisture must not exceed 12% moisture content, or 3% moisture content difference between hardwood flooring and subfloor. If sub-floor moisture exceeds the amount aforementioned, the source of the moisture must be located and eliminated before installation.

Concrete Subfloors

Concrete subfloors must be fully cured, at least 60 days old, and should have minimum 6-mil poly-film between the concrete and ground. Lightweight concrete can hold more moisture and may take longer to dry out to an acceptable moisture content. A moisture barrier is required over all concrete subfloors. Installations over concrete require the use of a Calcium Chloride test per ASTM F 1869, or ASTM F2170 in-situ Relative Humidity test using probes inserted into holes drilled into the concrete. Test all areas where wood will be installed. The results of the Calcium Chloride test should not exceed 3 lbs per 24 hours per 1000 square feet and in-situ test results should not exceed 75% RH. Carefully record all testing results. These tests give a snapshot of moisture conditions at the time of the test, but do not reflect

the permanent year-round condition of the substrate. If gluing down on concrete that is on or below grade, it is highly recommended to use a concrete sealer approved by the manufacturer from the adhesive you have chosen, even if you believe the concrete is dry. A concrete slab on or below grade that measures dry today may become moist in the future and cause floor failure. PF is not responsible for site related moisture issues.

NAIL DOWN/STAPLE INSTALLATION GUIDELINES

NOTE: For planks wider than 6.5” less than 7.5”, follow the ‘Nail + Glue Assist’ Installation Instructions. Nail down installation is not recommended.

NOTE: Nailing planks wider than 7.5” without a full spread adhesive will void all warranties. Nail down installation is not recommended.

Recommended Nail/Staple Systems:

Power Nail pneumatic Model 50P Flex: 18 gauge
Porta Nail pneumatic Model 4614: 18 gauge
Bostitch pneumatic Model EHF1838K: 18 gauge
Primatech pneumatic Model Q550R: 18 gauge

ENGINEERED WOOD RECOMMENDED FASTENER SELECTION

Board thickness ½" - 5/8"	18 or 20 gauge engineered flooring staples or cleats	1-1/4" or 1 -1/2" long
Board thickness 3/8"-7/16"	18 or 20 gauge engineered flooring staples or cleats	1" or 1-1/4” long

Nail Down/Staple Installation Instructions

- Make sure to properly test subfloor before installation, following subfloor preparation instructions previously discussed.
- A 15 lb. felt paper moisture barrier should be applied to the plywood subfloor with 6” overlaps before installing the new wood floor per ASTM D-4869.
- Create a working line parallel to the starting wall, in multiples of our engineered plank width, to set up the baseline of installation.
- Starter Rows requires that installation be done by leading with the tongue. When starting at the wall, trim groove off the back of the boards being used for the starting row. Face nail the back edge of the board with 18- gauge nails. Then

blind nail into the pocket above the tongue with one of approved nail/staple systems.

- Install the second row by sliding the groove side on to the tongue of the first row. Blind/edge nail it into place, with fasteners every 4" to 6" and 2" to 3" from each end joint. Stagger end joints at least 8”. Continue nailing and gluing 2-3 rows at a time in this manner across the room. Avoid creating “H” patterns (where an end joint is adjacent to another end joint in the second to last row installed). Use cut ends to start the subsequent row, discarding any pieces shorter than 8”.
- Use adjustable pneumatic power hammer or nailing machine with 1 1/2” – 2” nails as is required and make sure nailing foot is appropriate to the nails/staples used. To avoid damage to the tongue be sure to adjust for proper pressure on the compressor.
- Add each additional row of flooring, watching the pattern repeat and offset or stagger the joints as desired. (Generally, joints should either match in a specific pattern or be staggered by no less than six inches). Finished areas should be covered with a breathable protective paper, NEVER PLASTIC, immediately after installation to prevent damage. Do not tape protective paper to the finished surface of the wood for extended periods of time.
- Install molding and trim. (Always fasten moldings to the wall, not the flooring.)
- Do not allow foot traffic on finished floor for 24 hours after installation is completed.

Disclaimer

PF Engineered Harwood Flooring products are not warranted against squeaking, popping or crackling when using nail down/staple installation methods. Squeaking, popping or crackling is normal, and these symptoms may be aggravated in arid areas or during dry conditions.

Nail + Glue Assist Installation Instructions

NOTE: Nail + Glue Assist installation is recommended when nailing down/staple planks over 6.5” wide and less than 7.5” wide.

There are two recommended methods for glue assist.

Method one: Glue applied to subfloor. This option can be used on most products and is the most efficient to employ. Select the area of substrate on which you’ll be installing. As with any glue application, select an area that can be worked comfortably within the adhesive’s open time. Apply beads of adhesive directly to the subfloor perpendicular to the direction of the flooring boards. Place beads maximum

of 12” apart. Place boards onto glued area as normal and set fasteners. Clean up any excess glue immediately according to glue manufacturer’s instructions.

Method two: Glue applied directly to floorboards. This glue assist option is recommended for products with long fixed length boards. Apply adhesive to the underside of each board. Apply an 1/4” bead parallel to each end, approximately 1” from the end. Apply in an 1/4” bead a serpentine pattern down the length approximately in the center of the board, keeping the glue 1” in from the edges of the board. Carefully set the board in place (to avoid getting glue on other surfaces) then nail in as normal. Clean up any excess glue immediately according to glue manufacturer’s instructions. Glue end joints certain wide plank products also requiring gluing of the end joints for added stability.

- Make sure to properly test subfloor before installation, following subfloor preparation instructions previously discussed.
- Create a working line parallel to the starting wall, in multiples of our engineered plank width, to set up the baseline of installation.
- Trowel spread the adhesive on the subfloor along the chalk line wide enough to allow the first row of flooring to be installed, being careful not to cover the line. Follow the adhesive manufacturer’s recommendations for wet lay times before proceeding to the next step.
- Starter Rows requires that installation be done by leading with the tongue. When starting at the wall, trim groove off the back of the boards being used for the starting row. Face nail the back edge of the board with 18-gauge nails. Then blind nail into the pocket above the tongue with one of approved nail/staple systems.
- Trowel spread enough adhesive to install 2-3 more rows.
- Install the second row by sliding the groove side on to the tongue of the first row. Blind/edge nail into place, with fasteners every 4" to 6" and 2" to 3" from each end joint. Stagger end joints at least 8”. Continue nailing and gluing 2-3 rows at a time in this manner across the room. Avoid creating “H” patterns (where an end joint is adjacent to another end joint in the second to last row installed). Use cut ends to start subsequent row, discarding any pieces shorter than 8”.
- Use adjustable pneumatic power hammer or nailing machine with 1 1⁄2” – 2” nails as is required and make sure nailing foot is appropriate to the nails/staples used. To avoid damage to the tongue be sure to adjust for proper pressure on the compressor.

- Add each additional row of flooring, watching the pattern repeat and offsetting or staggering the joints as desired. Generally, joints should either match in a specific pattern or be staggered by no less than six inches. Finished areas should be covered with a breathable protective paper, NEVER PLASTIC, immediately after installation to prevent damage. Do not tape protective paper to the finished surface of the wood for an extended period of time.
- Install molding and trim. Always fasten moldings to the wall, not the flooring.
- Most adhesives require the installer clean adhesive off the flooring boards during installation. Follow adhesive manufacturer's recommendations for this procedure.
- Do not allow foot traffic on finished floor for 24 hours after installation is completed.

Disclaimer

PF Engineered Harwood Flooring products are not warranted against squeaking, popping or crackling when using nail down/staple installation methods. Squeaking, popping or crackling is normal, and these symptoms may be aggravated in arid areas or during dry conditions.

GLUE-DOWN INSTALLATION GUIDELINES

Recommended Adhesive:

Bostik's Best, Greenforce, or Vapor-Lock Dri-Tac Golden Bullet, or Supreme Green Sika T-35 Titebond 771, or 811

Suggested Trowels:

Consult with adhesive manufactures to confirm the trowel size.

Glue Down Installation Instructions

- PF strongly recommends glue-down to be the best way to install engineered flooring.
- Make sure properly test subfloor before installation, following subfloor preparation instructions previously aforementioned.

- Apply a moisture barrier to slab. Bostik, Dri-Tac, Sika or Titebond are recommended.
- A urethane-based adhesive should be used exclusively. Bostik, Dri-Tac, Sika or Titebond is recommended.
- Create a working line parallel to the starting wall in order to set up the baseline of installation.
- Follow the spread rate and curing time suggested by the glue manufacturer. Spread glue evenly on the subfloor to cover an area appropriate to the number of planks that can be laid in time for best result of the glue.
- Lay one row of floor planks along the entire length of the work line. Add each additional row of flooring, while watching the pattern repeat and offsetting or staggering the joints as desired. Generally, joints should either match in a specific pattern or be staggered by no less than six inches.
- An 1⁄2” expansion space should be left around the perimeter. Roll whole floor with an 150 lb. roller within 3-6 hours after installation. Finished areas should be covered with a breathable protective paper, NEVER PLASTIC, immediately after installation to prevent damage. Do not tape protective paper to the finished surface of the wood for extended periods of time.
- Clean wet adhesive from the surface of the floor frequently using the manufacturers recommended remover. Use clean towels, changing frequently to prevent haze and residue. Contact the adhesive manufacturer for adhesive removal remedies.
- Do not allow foot traffic on finished floor for 24 hours after installation is completed.

FLOATING INSTALLATION GUIDELINES

Recommended Poly-form Underlayment:

Eternity's Seal Guard Zero VOC
MP Global's Sound Buffer or Quiet Walk

Floating Installation Instructions

- Make sure to properly test subfloor before installation, following subfloor preparation instructions previously aforementioned.

- If needed, apply a moisture barrier to slab. Bostik, Dri-Tac, Sika or Titebond are recommended.
- After the moisture barrier has cured and dried apply a floating floor poly-foam underlayment, Eternity's Seal Guard Zero VOC, MP Global's Sound Buffer or Quiet Walk are recommended. Please follow manufacturers installation instructions.
- Floating floors is generally a more difficult installation to start, as the boards will move. It is imperative the first few rows be straight and gap free.
- Create a working line parallel to the starting wall, in multiples of our engineered plank width, to set up the baseline of installation. A bead of adhesive should be applied all along the TOP groove of each plank, any PVA glue meeting European DIN EN 204 D3 standard is recommended.
- Lay one row of flooring planks along the entire length of the work line. Work with the tongue side outward. NEVER engage material by striking the groove edge, use a tapping block against the tongue or board puller to avoid edge damage while engaging plank. Add each additional row of flooring, watching the pattern repeat and offsetting or staggering the joints as desired. Generally, joints should either match in a specific pattern or be staggered by no less than six inches.
- A minimum 1⁄2” expansion space should be left around the perimeter.
- Finished areas should be covered with a breathable protective paper, NEVER PLASTIC, immediately after installation to prevent damage. Do not tape protective paper to the finished surface of the wood for extended periods of time.
- Do not allow foot traffic on the finished floor for 24 hours after installation is completed.

Disclaimer

Upon completion of the floating installation of a random length engineered wood floor, the floors surface may not appear as continuously flat as compared to a traditional long strip floating floor. Hollow sound and squeaking should be expected since the flooring is not secured to the subfloor by means of chemical fastening (gluing) or by mechanical fastening (staples, cleats or nails). Hollow sound is NOT a defect caused by manufacturing, but rather the result of the way in which the floor is put together.

RADIANT HEAT SYSTEMS

NOTE: Installations over radiant heated subfloors must use the ‘Glue Down’ or ‘Floating’ installation methods. DO NOT use the ‘Nail Down’ or ‘Nail + Glue Assist’ methods.

NOTE: Any product other than European and American Oak with a plank width wider than 8- 1/2” is **NOT WARRANTED** in installation over radiant heat system.

Hardwood flooring works as an insulator. Heat-loss calculations designed for wood flooring installations should restrict the operating temperature of the radiant heat system to never allow the surface of the installed wood floor to exceed 80°F. If the ambient conditions of the airspace cannot sufficiently be maintained at 70°F with the radiant heating system operating at a maximum 20 BTU/hr/sf floor load, a supplemental heating system will be necessary. Separation of heating zones and thermostats, based on flooring type and temperature limitations, is required when multiple floor coverings are being installed over any radiant heating system. The radiant heating system should provide an even distribution of heat to the wood flooring surface. The wood floor surface temperature should vary no more than 3°F at any point within the installed wood floor. Wood flooring performs best with subtle changes in temperature. The floor should not fluctuate by more than 2°F per day. Items such as area rugs, mattresses, exercise mats, pet beds, bean bags, or other highly insulating products that cover the floor will trap heat and increase the temperature of the floor it is covering, which can result in irreversible damage to any type of floor. The end-user should consider the effects of heat build-up and subsequent flooring damage.

All radiant heating systems should be fully operational, regardless of season, for a minimum of 7 days prior to delivery of wood flooring. Keeping the system on helps force out moisture and ensures the system is operational prior to the hardwood flooring installation. Most PF Engineered Hardwood Flooring can be installed over radiant heat, providing all of the necessary conditions are met. Successful wood floor installations occur when the radiant heat system professionals, the radiant heating system installer, the wood flooring installer, and the end-user all communicate and fully understand what is required for the entire flooring system being installed. A supplemental humidity control system is often necessary and should be specified into any radiant heat wood flooring project, in order to properly support ambient airspace conditions between 35% - 55% RH. Supplemental humidification should be present and operational prior to delivery, during, and post-installation of the wood flooring. With the heating source placed directly below the installed wood flooring, the moisture content will forcibly be reduced during the heating season if supplemental humidification is not added, monitored, and

controlled. In-floor, or under-floor temperature and humidity data-logging devices are recommended to be installed by the radiant system installer or the flooring contractor, to monitor the conditions in the space after the floor has been placed into service. The end-user should have a clear understanding of the flooring product, maintenance requirements, humidification systems, data loggers, and the radiant heating system features, limitations, and abilities, to ensure adequate conditions are maintained year-round.

In all installations over radiant heat, the warranty will be void if any of the following system design, installation, or operation requirements are not adhered to:

System Design

- The radiant heat system must be designed and warranted by the system manufacturer for use under wood flooring.
- The system must have in-floor temperature sensors in all heating zones and a control mechanism or cutoff that will never allow the surface temperature of the wood floor to exceed 80°F.
- It is highly recommended to install embedded data loggers (embedded in the back of the plank) such as a Floor Sentry® or Fidbox® that continuously record temperature and relative humidity. Data loggers should be installed in each separate heating zone. Data from these units can help prevent flooring failures by alerting the occupant to conditions that might void the warranty and damage the flooring.
- The radiant heat system must be a hydraulic system. PF products are not warranted over electric radiant heat systems.
- Radiant heat systems embedded in a cementitious subfloor must have a minimum of 3/4” of concrete or gypcrete above the heating system.
- The radiant heat system design engineer and radiant heat system installer should design the heating system to restrict the operating temperature to never allow the surface of the installed wood floor to exceed 80°F while being heated by the in-floor heating system.
- The radiant heat system, once fully operational, must have a maximum heat output of 20 BTU/hr/sf for each zone receiving wood flooring.
- The system design must evenly distribute the heat across the entire wood floor area, such that the surface temperature of the wood floor never varies more than 3°F at any point in time across the surface of the heated flooring, as inspected with a thermal imager.

- The radiant heating elements must run perpendicular to the wood flooring planks.
- Thermal gain from windows can have a huge impact on the surface temperature of the floor. Window treatments such as UV-blocking films, blinds, drapes, etc. are often necessary to ensure compliance with the above requirements.
- Rugs, mattresses, exercise mats, pet beds, furniture without legs, or other insulating products that cover the floor will trap heat and increase the temperature of the floor, which can result in irreversible damage. When the floor is expected to be covered, the radiant heating design engineer and the radiant heating installer should calculate and factor in the R-value of the specific insulating item and make adjustments to the heating output as necessary. The end user must be informed of the effects of heat build-up and subsequent damage.

Installation and Operation of System

- For concrete subfloors, conduct and document Calcium Chloride Tests per ASTM F1869. Test results must not exceed 2.0 lbs. per 1000 square feet per 24 hours.
- For wood subfloors, use a pin type meter to document the moisture content of the subfloor. Moisture readings should not exceed 8% in any location and readings for the subfloor must be within 2% of the flooring at the time of installation.
- For systems where the heating elements are embedded or installed below the subfloor, the heat must be on and operating at normal output for a minimum of 7 days prior to bringing the wood on site for acclimation, in order to allow any moisture in the subfloor to flash off.
- Wood flooring must be delivered to the jobsite and thoroughly acclimated to jobsite temperature and humidity conditions with the radiant heat system on and functioning.
- Wood flooring performs best with subtle changes in temperature. The floor temperature should never be increased or decreased by more than 2°F per day.
- Relative humidity at the jobsite must be maintained between 35% and 55% at all times. Failure to maintain proper humidity levels will void all warranties.
- The system must be kept on and within 15°F of normal operating temperature at all times.

- Temperature in the installation area must be controlled between 60°F and 80°F at all times.
- After installation, do not cover a radiant-heated wood floor with protective covering for longer than a few hours. Leaving any type of protective covering on top of a heated floor can create an ‘oven effect’ and damage the wood.
- Excessive or uneven heat, rapid heating, and/or failure to maintain humidity levels between 35% and 55% may cause cracking, cupping and other forms of failure and will void the warranty.

NOTE: In wood flooring installations over radiant heat, moderate surface checking, cracking (especially at the ends of boards and around knots), shrinkage, gapping between planks, and slight cupping are all to be expected and do not constitute a product defect. Also, failure to comply with these requirements may result in structural damage including wood shear which will not be covered by this warranty.

See Warranty & Maintenance for more information.

For more general installation instructions, see NWFA Installation Guideline for more details. www.nwfa.org (800-422-4556)

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 www.P65Warnings.ca.gov/wood.