



Thank you for choosing BellaWood® floors

NAILDOWN and GLUEDOWN INSTALLATION INSTRUCTIONS 3/4" Solid wood and Low profile 5/16" - 1/2" flooring

PLEASE READ THESE INSTRUCTIONS THOROUGHLY BEFORE BEGINNING YOUR INSTALLATION.

We recommend the installer understands and follows standard installation guidelines as set forth by the (NWFA)-The NATIONAL WOOD FLOORING ASSOCIATION WWW.NWFA.ORG. Where these instructions differ from the (NWFA) guidelines this document takes precedence.

Look for helpful [TIPS] and [CAUTIONS] throughout this document

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PRODUCT USAGE

BellaWood® solid prefinished domestic and exotic products are installed using standard hardwood floor staplers or cleat nailers. While Professional installers have preferences, both types work well. Installers also understand how species variations will affect workability. Some species tend to be very hard, others somewhat brittle during nailing. These natural characteristic are not considered defects. To prevent board damage, nailing methods such as hand nailing may be required when installing the harder species like Rose wood, Walnut or Teaks. See our nailing recommendations.

The BellaWood® solid lower profile flooring sizes (1/2"- 5/16") is installed using specially designed pneumatic hardwood floor staplers or cleat nailers. Ensure that you are using the correct sized fasteners and adaptors. These sizes can also be glued to plywood or with an approved moisture barrier can be glued on concrete. DO NOT nail or glue solid products below-grade.

BellaWood® can also be installed over in-floor radiant heat, however not all species are recommended for this application.

Choose species with higher stability ratings and always use moisture barriers, details are outlined in this document.

Installations outside these guidelines are viewed as experimental.

OWNER/INSTALLER RESPONSIBILITIES - Install flooring in proper lighting

Exotic and domestic hardwoods are beautiful and unique products of nature characterized by distinctive variations in grain pattern and color. These **natural variations** are not flaws; rather they make up the natural beauty and uniqueness of hardwood flooring and should be expected. Only topically stained products will have the most uniformity in color or shade. Our floors are manufactured in accordance with accepted industry standards which permit a defect tolerance not to exceed 5%, of a manufacturing or natural type.

When flooring is ordered, depending on layout or species, **8 - 12%** extra material should be added to the actual square footage needed for board selection and cutting. Diagonal layouts or custom installations usually require about 15% more. During installation any boards deemed unacceptable should be replaced using the extra material ordered. The use of putty, stains, filler sticks or **touch up** markers to correct defects in prefinished wood during installation is accepted as a normal procedure. Board width variances are considered normal for boards and all organic materials. To minimize board edge gapping, board widths greater than 1/16" should be selected out and used all together in the same row or placed in closets or near walls. The **customer/installer** assumes responsibility for **final inspection** of product quality. Carefully examine the flooring for color, finish and quality before installing. Use reasonable selectivity and judgment, select out or cut off pieces with glaring defects. If more than 5% of the material is unusable contact your local store or call **CUSTOMER CARE 800-366-4204** immediately. Before beginning the installation the installer must determine if job site and subfloor conditions are acceptable. Installers must be up-to-date with installation procedures.

FASTENER SELECTION

NAILDOWN &

GLUE DOWN INSTALLATION

MOLDINGS & TRANSITIONS

ROUTINE MAINTENANCE

HARDWOOD REPAIRS

SEASONAL CHANGES - What to Expect

RADIANT HEAT SYSTEMS

CUSTOMER CARE AT 800-366-4204

Lumber Liquidators denies any responsibility for problems arising from job site failures, environmental or moisture issues, inappropriate or improperly prepared subfloors, poor installations and improper tool usage.

JOB SITE INSPECTION

For best performance, wood flooring should be one of the last items installed. Heating and air conditioning systems should be fully operating and running at least 7 days before the installation. To prevent moisture related issues such as board edge cupping, all **wet work** involving water or moisture (plumbing, plaster /drywall ceilings or wall finishes, painting, etc.) should be finished with ample time allowed for complete drying prior to wood floor installation. New concrete should be cured and at least 60 to 90 days old.

ACCLIMATION/CONDITIONING THE FLOORING

Wood products are affected by environmental conditions. Before installation, **acclimate** the new flooring in the areas to be installed **10-14 days** for most dense exotic species or **2 – 7 days** for domestic (North American) species to consistent indoor temperatures of **60°-80° F** and constant indoor humidity levels of **35% - 55%**. Very dry or humid regions may require extended conditioning. Proper acclimation levels **maintained** after installation will minimize board movement, excessive squeaks and gaps. Proper acclimation is the responsibility of purchaser/installer.

HANDLE WITH CARE

To prevent board warping or bowing; do not cut the packaging plastic support bindings until ready to install. Do not stand flooring on ends or sides. Do not store directly on bare concrete or next to outside walls. Cartons should be placed as close to the center of the installation area as possible. Store flat supporting to the ends and center sections. Store in a dry place being sure to provide air flow under and around cartons. Keep out of direct sunlight and away from air vents.

VENTILATED CRAWL SPACES To prevent moisture build-up homes with crawl spaces must have vents for proper cross-ventilation. Provide year-round air circulation with multiple vents. Venting allows damp areas to dry-out. Vents must be adequately spaced so that no dead air spaces remain. Under the home in the crawlspace use black 6-mil polyethylene sheet plastic as a **moisture barrier**. Completely Cover 100% of the surface of the ground to guard against excessive moisture. Overlap plastic seams 6" and duct tape.



Delay installation until the above guidelines are completed.

MOISTURE

[CAUTION] Lumber Liquidators recommends the use of moisture barriers. Most installation failures result from a moisture imbalance. All subfloors must be tested for moisture content. Know your moisture levels and document the readings. Do not deliver flooring to the jobsite until moisture problems are corrected.

Wood subfloors: Determine if conditions are dry before installing. Wood subfloor moisture reading must not exceed **12%**; the ideal moisture content within new wood flooring is **6%-9%**. The differential balance between new boards and subfloor must not exceed **4%** or **2%** for board widths over 2 1/4". If moisture readings are too high, postpone the installation, find the moisture source and correct. Raise heat and increase ventilation, holding off installation until proper conditions are met. **Do not use pressure treated plywood for interior use as these can have high moisture content and latent with rot resistant chemicals**

Concrete subfloor: Prior to installation, concrete should preferably be **60 to 90 days old**, the moisture content of concrete must be measured. Moisture testing establishes the presence of moisture at the time of measurement. Of greater concern is future moisture transferring up through the slab to the surface, therefore, the use of a moisture barrier is necessary.

CEMENT MOISTURE TESTING PROCEDURES

Calcium chloride test is the only quantitative test available at this time and must be performed to determine the extent of moisture passing through the slab. The emission of moisture through the slab must not exceed 3 lbs per 1,000 sq ft, in 24 hours. Calcium chloride test kits are available at most flooring supply distributors.

Phenolphthalein tests may also be performed by using a 3% phenolphthalein solution in water-free alcohol. Drill dime-sized holes, 1/4" deep, in various areas of the concrete slab, particularly around the walls. Then apply two drops of the solution into each of the drilled holes. If there is no color change in the solution, then there is not enough moisture to affect the installation. If the solution turns pink or dark red within five minutes, further testing must be done with a moisture Encounter meter or calcium chloride test kit.

A simple "**condensation test**" may be performed by taping 18"x18" polyethylene sheets in several locations on the concrete slab. Lamps are then placed close enough to warm these areas and allowed to remain in place for 48 hours. Moisture under the plastic sheets or darkening of the concrete surface under the sheets is an indication of moisture in the concrete.

Alkalinity test recommended for gluedowns. Alkali can be visible as a white powder on the surface of the concrete. Alkali is excess salt contained within the concrete that can cause **adhesive failure** over time. This problem is magnified if moisture is present and passing through the concrete depositing excess salt on the concrete surface. A simple **pH test** will determine the presence of alkali on a slab surface; Apply a few drops of distilled water to a small thoroughly clean and scraped concrete surface area and place a strip of pH paper to the wetted area. The paper will change color within 5 minutes. Compare the color change to the chart standard supplied

with the paper to indicate the pH of degree of alkalinity. A pH range from 5 to 10 is acceptable. Corrective measures must be taken with any concrete slab that measures a pH reading above 10. Contact adhesive manufacturer for corrective instructions.

Wood floor owner and installer are solely and jointly responsible for site conditions, pre-installation moisture checking of new floor and subfloor and must ensure that all conditions and specifications listed in this guide have been thoroughly met prior to installation.

SUBFLOOR PREPARATION

Do not install flooring directly over joist without subflooring.

All structural panels/underlayment must be installed sealed-side down, and provide 3/4" perimeter spacing. Square-edged or non tongue and grooved panels used as a subfloor will require a minimum 1/8" (3 mm) expansion space between all plywood seams.

Panels must meet minimum CDX grade Exposure 1 and US Voluntary Product Standard PS1-95, PS2-04 or Canadian performance standard CAN/CSA 0325-0-92 for construction sheathing. Check underside of panel for codes. Minimum of 3/8" panel thickness is recommended when used as an underlayment.

Note that joist spacing determines minimum subfloor thickness.

- Joist spacing **16" on center (oc)**
Plywood: Minimum of (5/8") **Oriented Strand Board (osb):** Minimum (3/4", 23/32") **Advantech** Minimum (3/4", 23/32")
- Joist spacing **16" up to 19.2" (oc)**
Plywood: Minimum of (3/4", 23/32") **Oriented Strand Board (osb):** Minimum of (3/4", 23/32")
- Joist spacing over **19.2" up to maximum 24" (oc)**
Plywood: Minimum of (7/8") **Oriented Strand Board (osb):** Minimum of (1")
- **Particleboard or Masonite:** is not recommended, remove or cover with 3/8" plywood.
- Avoid **pressure treated plywood** for interior use as these can have high moisture content and latent with rot resistant chemicals.

Flat wood subfloors

- The final surface must be flat to within **3/16" in a 6'** radius, or within **1/4" in 10'**. Subfloor must be securely nailed or screwed down to joists to prevent movement or squeaks. Install over 16" center-to-center joist sub-structure. Thoroughly inspect and replace existing floor or subfloor that shows evidence of water damage or structural weakness. Check for and repair any sagging or loose sections of a wood subfloor. Squeaky or loose boards should be re-nailed. An uneven or cupped wood subfloor is an indication of excess moisture, identify and correct. High spots may be planed or sanded down. Low spots should be cut out and repaired or may be filled with old pieces of firm vinyl or build up with 30 lb. black roofing paper. Do not fill low areas under naildown flooring with cement patches as these will break down over time.

Flat concrete

- A flat cement surface is very important when gluing down ridged solid wood. The final surface must be flat to within **1/8" in a 6'** radius, or within **3/16" in 10'**. Sand or grind down high spots. Fill valleys or low areas with cement based leveling compounds compatible with the flooring adhesives. Allow extra drying time for the leveling compounds. Do not install on new concrete less than 60-90 days old.



GENERAL INFORMATION (all installations)

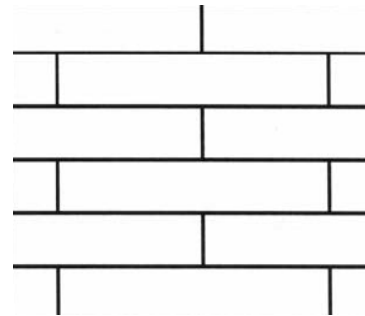
- Customers are advised to be home during the installation for consultation.
- Customer and installer should discuss installation and layout to maximize satisfaction.
- Inspect flooring during installation.
- Maintain proper perimeter expansion gap.
- Trim bottom of the door frame with handsaw to insert boards underneath.
- Avoid board grouping. Board sizes should be intermingled.
- Floor should be installed from several cartons at the same time to ensure good color, shade and appearance.
- Save a box of flooring for use in future repairs.
- After installation, do not fully cover the new installation with plastic or paper. Moisture or board discoloration issues may result.
- Because jobsite conditions can be dry today and wet tomorrow the use of moisture barriers are recommended.

Board placements (all installation methods)

Incorrect



(fig 1) Avoid board-end "line up"



(fig 2) Avoid "H" Joints

Typically, board stagger is three times a board's width. Proper board placement provides greater floor strength and better overall appearance of the floor.

(3/4") SOLID WOOD FASTENER SELECTION refer to [EXOTIC WOOD NAILING TIPS]

CLEAT NAILER (examples) 16 gage

- Power Nailer 445** (Pneumatic) Cleat nails 1 1/2" - 2" long 800-323-1653
- Bostich MIIFN** (Pneumatic) Cleat nails 1 1/2" - 2" long 800-556-6696



Cleats

STAPLER (examples) 15 gage

- Bostich MIIIFS** (Pneumatic) staples 1/2" wide 1 1/2" - 2" long
- Powernail 445FS** (Pneumatic) 1/2" wide 1 1/2" - 2" long



Staples

(5/16" to 5/8") LOWER PROFILE

Special nailers, shims or shoe accessories are usually required

CLEAT NAILER (example) 18-20 gage cleats

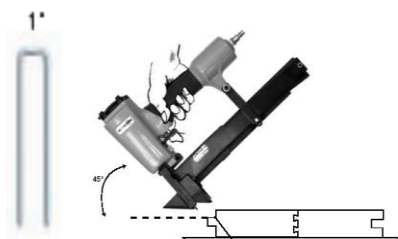
Pownail Model 200p/250m/50p/50m (Pneumatic) Cleat nails 1"- 1 1/2 " long

**(3/8"- 5/16") LOWER PROFILE**

Special nailers, shims or shoe accessories are usually required

STAPLER (examples) 18-20 gage Staples

Bostich LHF97125-2-20	(Pneumatic)	staples 1"- 1 1/4" long	800-556-6696
SPOTNAILS WS4840W2	(Pneumatic)	1"- 1 1/4" long	800-323-1653
SENCO SLS20HF	(Pneumatic)	1"	800-543-4596
PORTA-NAIL 475	(Pneumatic)	1"	800-634-9281



Important: Set air compressor to 70-80 PSI. **Test and adjust** air pressure to ensure proper setting of fasteners. Make sure that the fastening machine is fully adjustable, is in good working condition, is at the appropriate angle and seats properly against the tongue of the board to prevent top edge and surface dimple damage.

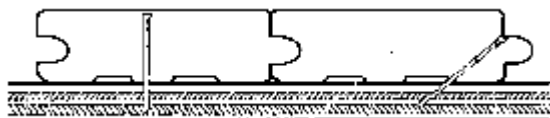
**[EXOTIC WOOD NAILING TIPS]:**

- **Tongue fracture** and **surface dimpling** during installation is common and can be minimized by **(1)** Installing the flooring in proper lighting **(2)** using the correct nail thickness, **(3)** using the recommended shoe adaptor, or **(4)** changing the angle of nail entry.
- To further reduce the occurrence of **surface dimpling** and **tongue fracture** the use of flooring nailers with a thinner 18-20 gage cleat nail may be needed for the harder exotics species. In addition, many installers will sometimes temporarily adjust the nailer angle by applying layers of duct tape to the bottom foot plate of the nailer. The use of an over-size base or foot plate to distribute the nailing force is encouraged. If however, surface dimpling or tongue fracture occurs when nailing the denser species, drilling pilot holes and **hand nailing** may be required.
- Use caution when fastening the harder exotics with Staplers. The drive bar in Staplers are wider and if fasteners are overdriven can act like a wood chisel, splitting tongues. Do not mix fasteners when nailing. Staples and cleats hold differently when mixed can result in irregular seasonal gapping and or movement. When face or top nailing, pick areas of the grain or pattern that would best hide touch-up fillers.
- If nailers prove difficult fastening the lower profile 3/8" or 5/16" floors, many installers will use **100% urethane wood floor adhesives** rather than nailers, especially with the more brittle species like; Australian Cypress, Brazilian Walnut, Teaks. Do not use significantly bowed, crooked or twisted boards. Use a wood spline or slip tongue whenever a change of board direction is needed, wood splines should be both glued and nailed into place. Forcing or pounding floor boards together with a rubber mallet during assembly may burse or damage unprotected board edges.

NAILDOWN INSTRUCTIONS

Starting point, first three rows. When installing over crawl spaces or rooms over basements use 15 lb. black roofing paper to provide some protection against moisture vapors, butt seam edges together. Red rosin paper may be used where there are no moisture issues. Install the flooring perpendicular to the floor joist. Use the longest, straightest boards available for the first two rows.

- (1) Determine the starting wall. At the two opposite ends of this wall, measure out and mark the floor the width of the floor plus the expansion gap. The **Expansion gap** is normally the same as the thickness of the new flooring, for example, 1/2" flooring will require 1/2" expansion.
- (2) Snap on the floor a chalk line connecting the two floor marks. While maintaining the expansion space, place the groove side along the starting wall and align the tongue side of the first row of boards on the chalk line. **THE FIRST THREE ROWS MUST BE STRAIGHT.**
- (3) Pre-drill and top nail the first row of boards only. Hand nail the following rows until nailing machines can be used.



- (4) Next, rack-out or lay-out the floor for best visual appearance and adjust before nailing the floor.

[CAUTION]: When top nailing pre-finished wood it is recommended to pre-drill and hand nail. Although pneumatic nailers are faster they easily damage the wood surface and finishes. Ensure that the nailer is not damaging the pre-finished wood.

COMPLETING THE FLOOR

- During installation, work several rows at a time, REFER to nailing schedule below. Tighten boards as necessary to reduce gaps.
- End-joints of adjacent rows should be staggered 4" to 6" when possible to ensure a more favorable overall appearance. Top-nail the first and last rows where clearance does not permit blind nailing with stapler or finish nailer.
- Rip or cut final row to fit and top-nail. If the final row is less than 1" in width it should first be edge-glued to the last UNINSTALLED row and the two joined units should be face-nailed as one board.

Fastener spacing recommendations are based on board size; per (NWFA)

- Board size **2 1/4" wide x 3/4" thick**, nail placement is every **8"-10"** apart and a nail placed within 1- 3" of each end, with at least two nails per board
- **3"w x 3/4"** place fasteners **6"- 8"** apart and within 1- 3" from each end with at least two fasteners per board
- **4" to 8"w x 3/4"** place fasteners **6"- 8"** apart and within 1- 3" from each end with at least two fasteners per board
- **5/16" thick solid** and all **engineered flooring** place fasteners **3"- 4"** apart (for staples), **4"- 6"** (for nails) and within 1- 2" from each end with at least two fasteners per board
- **3/8" thick**, place fasteners **6"- 8"** apart and within 1- 2" from each end with at least two fasteners per board
- **1/2" thick**, place fasteners **10"** apart and within 1- 3" from each end with at least two fasteners per board

GLUE DOWN OVERVIEW

[TIPS]:

- Lumber Liquidators recommends **moisture testing**, the use of **moisture barriers**
- Wood floor **adhesives** alone are not moisture barriers.
- Glue manufacture may recommend rolling the floor throughout installation to ensure glue transfer
- For the best results, **do not mix adhesive products**. Use moisture barriers and adhesives from the same manufacturer
- Use the **trowel size** recommended by the adhesive company to get required spread rate and ridging height. Typically, trowel size is determined by board type, size and surface texture. (Ensure a 95% min glue-to-board glue transfer).
- During constant use trowel teeth will wear down. For best glue coverage **use a new trowel** with each new container of adhesive.
- **Discard** twisted or warped boards.
- Follow the glue manufacturer's labeling instructions regarding adhesive set time, correct trowel size, removal of surface sealers or contaminants and use of moisture barriers.
- Mix product from **several cartons** as you install the floor to insure color, grain and shade mix.
- Install the flooring parallel to the longest wall in the room. Keep the flooring straight using a chalk line.
- Blue painter **tape #2080** can be used to keep rows or sections of floor boards together until the adhesive has cured. Tape together 4 or 5 rows at 18" intervals. (Incorrect tape can harm the finish.)

[CAUTION]: Many installers choose to use straps or clamps in an effort to force board rows tighter together during installation. Be advised that **over-strapping** wood could adversely affect the floor and can result in glue-bond failure, seam peaking, twisted boards or out-of-square floor board alignment.

ADHESIVES

Cured adhesive can cloud, chemically damage or etch the floor's finish. Clean wet adhesive from the surface of the floor frequently with mineral spirits or manufacturer-recommended remover. Use clean towels, changing frequently to prevent haze and adhesive residue.

Manufacturer

Mapei 800-992-6273

WFM a moisture barrier

Ultrabond 980, 990 solid wood adhesives

Eco 995 An all-in-one adhesive and moisture barrier

Bostiks 800-523-6530

MVP a moisture barrier

BBA a solid wood adhesive

Vapor-Lock An all-in-one adhesive and moisture barrier

TYPICAL TROWELS AND APPROXIMATE COVERAGES*

Examples shown are for estimating purposes only. Have several trowel sizes on hand as actual jobsite coverage will vary.

For moisture barriers and 5/16" to 3/8" solid wood

Coverage est.



3/16" x 5/32"

70 to 80 sq. ft./U.S. gal.

For 3/4" solid wood



1/4" x 1/4" x 1/4"

30 to 40 sq. ft./U.S. gal.

3/8" up to 1/2" solid wood



1/4" x 3/16" x 1/2"

40 to 45 sq. ft./U.S. gal.

For solid wood aim for 95% glue-to-board coverage, 80% for engineered

GLUE DOWN INSTRUCTIONS

Step 1

- (1) Determine the starting wall, usually the longest foundation wall. At the two opposite ends of this wall, measure out and mark on the floor the width of several rows of boards, (this could be 12" to 24") include the expansion gap. The **Expansion gap** is normally the same as the thickness of the new flooring, for example, 1/2" flooring will require 1/2" expansion.
- (2) Next, use a chalk line to connect the two marks. Follow this chalked line when applying both the adhesive and boards. **THE FIRST ROWS MUST BE STRAIGHT.**
- (3) Using an approved trowel and wood flooring adhesive, glue the first few rows in the dry area, between the wall and chalk line.
- (4) First row only. Using a table saw remove the tongue part, then place the tongue side towards the wall with groove side facing outwards. Lay flooring into the adhesive following the straight line. Stay off the new hardwood while working.
- (5) Progressively lay-in the next boards by engaging the tongue and groove then drop board into adhesive. Avoid dragging or sliding boards together as this can trap or squeeze glue up in between the boards creating gaps. Continue working 4 or 5 rows together, then measure and cut the last boards as needed to complete the rows.
- (6) The balance of a board cut is used to start a new row, discard lengths under 6". Avoid clustering of end joints. Stagger the ends of the boards correctly. Smaller boards should be intermixed throughout the installed floor. A tapping block can be used to gently tap the boards into proper position. During installation, end gaps between boards can be minimized by temporarily locking a completed row in place by using spacers placed between the wall and the last board of each row, remove when glue has dried.
- (7) Repeat the process. Chalk new lines, spread adhesive and continue working 4 or 5 rows together until completed.

INSTALLING THE LAST ROW

Step 2:

- Most often, the entire length of the last row will need to be trimmed so that it is narrow enough to fit the remaining space. It should be glued and wedged into place. Leave all spacers in the expansion space until the adhesive has cured, then remove. Keep the floor free from foot traffic, until adhesive has cured.
- Do not to spread adhesive too far ahead of your work area. If the adhesive skins over and fails to transfer, remove and spread new adhesive to achieve proper bonding to the subfloor.

- Occasionally lift a board and check for adhesive transfer. Adequate adhesive transfer is necessary to ensure sufficient holding strength.
- When not in use, keep the adhesive container tightly closed to prevent thickening and difficulty in spreading the adhesive. Proper ventilation within the room should be provided. Follow the recommendations on the adhesive container.

Post-installation

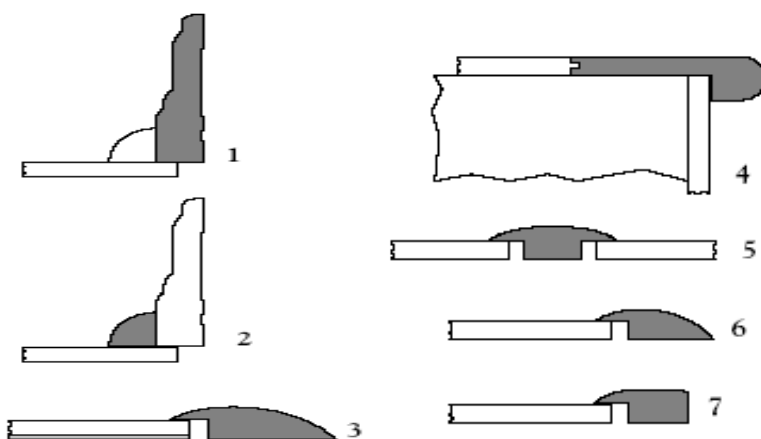
- After installation, allow glue to fully cure for 24 hrs before replacing furniture and foot traffic.
- For best matching of sheen or milling save a box of flooring for future repairs.

MOLDINGS & TRANSITIONS:

Installation Tips: acclimate wood moldings for best results

- Moldings should be predrilled to avoid splitting when nailing
- The tool of choice for cutting hardwood moldings is a 10" or 12" motorized miter saw with pre-set adjustments for the basic miter cuts at 22.5°, 45°, and 90°.
- A carbide tipped blade makes the best cuts. Be sure the saw blade rotation is positioned to cut into the finished face.
- When installing wall base molding, place the bottom nail below the finished line of the quarter round.
- Attach wall base or quarter round moldings to the wall, never into the floor.
- Miter cuts hide better than square cuts.

- 1) **Base Board** – for hiding imperfections and adding a custom finish along any wall.
- 2) **Quarter-Round** - for covering the expansion left at walls and other fixed surfaces.
- 3&6) **Reducer Moldings** - used to transition to lower floors.
- 4) **Stair Nosing** - for finishing the exposed edges of stairs and landings.
- 5) **T-Expansion** - for joining two areas of flooring of similar heights.
- 7) **End Cap** - for finishing the space at sliding glass doors, at bath tubs or transitioning to carpet.



HARDWOOD REPAIRS

- Minor scratch or dent damage can be repaired with a touch-up or filler kit available at most home centers. Major damage may require individual board replacements and is best accomplished by professional flooring installers.

SEASONAL CHANGES - What to Expect (all installation methods)

Seasonal gapping should be expected in all wood flooring and does not constitute a product failure.

It is normal that wood floors will be affected by fluctuating levels of humidity within the building. Care should be taken to control humidity levels to within the 35-55% range. To protect your investment and to assure that your floors provide lasting satisfaction, note recommendations below:

- **(Dry)** Heating Season - A humidifier may be needed to prevent excessive shrinkage in wood floors due to low humidity levels. Wood stoves, radiant floor heat and electric heat will create dryer conditions.
- **(Humid, Wet)** Non-Heating Season - Proper humidity levels can be maintained by use of an air conditioner or dehumidifier. Avoid excessive exposure to water during periods of inclement weather. Do not obstruct expansion joints around the perimeter of your floor.

RADIANT HEAT SYSTEMS

General Precautions and Recommendations - Always use moisture barriers.

Engineered wood flooring is the flooring of choice for radiant heat. However, when using solid wood make certain the product selected is recommended. Choose species highest in stability ratings for this application. Australian Cypress, Mesquite, Bamboo, and Teaks are good species choices. Brazilian Cherry is not recommended. Because of the wide array of systems on the market, each with its own features, please consult with your radiant flooring provider for recommended installation methods. Hydronic systems must include in-floor temperature sensors and an outdoor thermostat that allows the system to adjust the water temperature according to anticipated heat loss. Radiant heat contributes to the drying out of all woods. Use of a humidification system may be required to maintain the proper humidity level. The indoor relative humidity must be maintained between 35-55% year round. Failure to do so can result in edge cupping, squeaking delamination, splintering, or face checking.

Avoid shock to the floor, **Before** installation, run new systems to dissipate hidden or trapped moisture. **During** installation, reduce thermostat to 65°F. 48 hours **after** installation, slowly raise the temperature of the heating system to its preferred operating level over a period of 5 days. The surface temperature of the subfloor must never exceed **85°F** in any location. The temperature setting must always remain within 15°F of normal operating level, and should never be turned completely off. Excessive heat, rapid heating, and/or **failure to maintain humidity levels between 35% and 55%** is likely to result in cracking, cupping, squeaking and other forms of floor issues. Slight surface splits (checking), particularly at the ends of planks, should be expected with installations over radiant heat and does not constitute a product failure.

Test for moisture, This procedure must be followed regardless of the time of year.

Prior to installation over radiant heat, moisture testing must be conducted and documented. The moisture content for concrete substrates must not exceed 3.0 lbs. per 1000 square feet in 24 hrs per ASTM 1669-89 (Calcium Chloride Test). Wood subfloors should not exceed 12% using a pin type meter. Do not install the flooring until excess moisture is corrected.

RADIANT INSTALLATIONS **Related information can be found on our website ["Flooring 101"](#)**

- (1) When nailing planks over radiant heat ensure that fasteners are holding the flooring without damage to the radiant system.
- (2) When fully gluing planks over radiant heat ensure that the adhesives are recommended for this application.

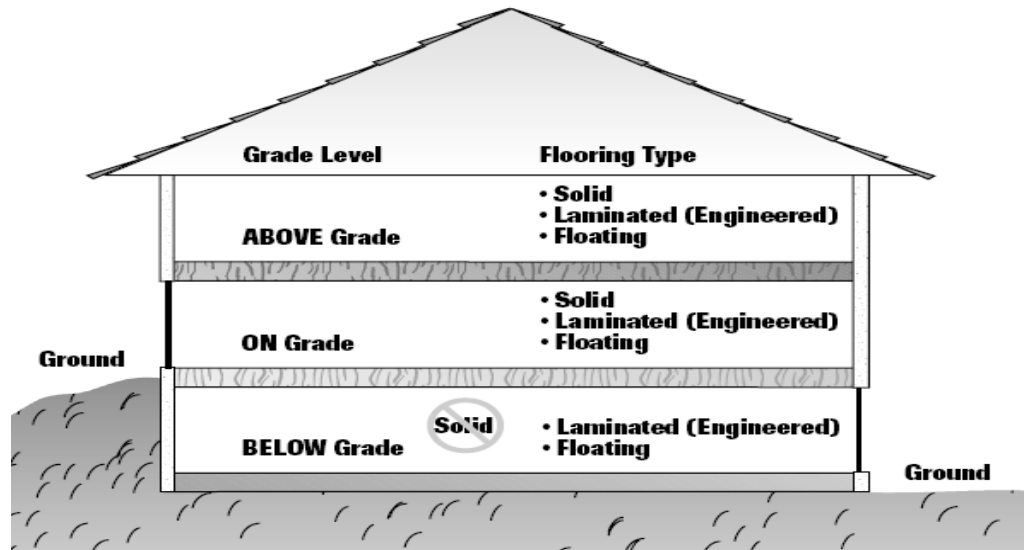
ROUTINE MAINTENANCE

1. Use a damp cloth to blot up spills as soon as they happen. Never allow liquids to stand on your floor.
2. For tough spots, such as oil, paint, markers, lipstick, ink, or tar, apply mineral spirits on a clean white cloth, then wipe the area with a damp cloth to remove any remaining residue.
3. Sweep, dust, or vacuum the floor regularly with a recommended hard floor attachment (not a beater bar) to prevent accumulation of dirt and grit that can scratch or dull the floor finish.
4. Periodically clean the floor with cleaning products made specifically for urethane finishes.
5. Do not wash or wet mop the floor with soap, water, oil-soap detergent, or any other liquid cleaning material. This could cause swelling, warping, delamination, joint-line separation and void the warranty.
6. Do not use steel wool, abrasive cleaners, or strong ammoniated or chlorinated type cleaners.
7. Do not use any type of buffing or polishing machine, these can generate heat or hot spots.
8. For spots such as candle wax or chewing gum, harden the spot with ice and then gently scrape with a plastic scraper, such as a credit card. Be careful not to scratch the flooring surface. Wipe clean with a damp cloth.
9. A more frequent dust-mopping or vacuuming schedule may be required in very sandy areas such as a beach home.

Protection

1. Entry mats will help collect the dirt, sand, grit, and other substances such as oil, asphalt, or driveway sealer that might otherwise be tracked onto your floor.
2. Do not use rubber or foam backed plastic mats as they may discolor the flooring finish. To prevent slippage, use an approved vinyl rug underlayment approved for urethane finishes.
3. Use floor protectors and wide-load bearing leg bases/ rollers to minimize indentations and scratches from heavy objects. As a rule, the heavier the object, the wider the floor protector.
4. Maintain a normal indoor relative humidity level between 35%-55% throughout the year to minimize the natural expansion and contraction of the wood.
5. Avoid excessive exposure to water during periods of inclement weather.
6. Do not walk on your floor with stiletto heels, shoes with sports cleats or exposed metal parts.
7. Do not allow sharp, pointed, or rough textured objects to be exposed to the hardwood flooring.
8. Keep your pet's nails trimmed to prevent them from scratching your floor.
9. UV sunlight will enhance the tone of different species of hardwood to varying degrees. Periodically rearranging your area rugs and furniture will allow the floor to antique or age evenly.
10. Use a dolly when moving heavy furniture or appliances; but first, put down a piece of quarter inch plywood or Masonite to protect the floor. Never try to slide or roll heavy objects across the floor.
11. A protective mat should be used for furniture or chairs with castors.
12. Use cleaning products safe for urethane finishes; never use oil soaps, wax, liquid or other household products to clean your floor.
13. Lumber Liquidators does not endorse the use of steam cleaning machines on hard wood products, use at your own risk.
14. Toys and tools can scratch the finishes, scratches and dents are jobsite related, not warrantable.
15. If using the glue-down installation method, do not allow foot traffic or heavy furniture on floor for 24 hours.

DO NOT INSTALL SOLID HARDWOOD PRODUCTS BELOW- GRADE



If any part of the soil surrounding a structure is above the floor of any level, consider that level below-grade. This includes walk-out basements. In addition, the surrounding soil should be sloped away from the structure with at least 6 inches of fall over the first 10 feet.



CAUTION: WOOD DUST Cut wood flooring outside

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.

Precautionary Measures: equipped power tools with a dust collector. If high dust levels are encountered; use an appropriate NIOSH-designated dust mask. Avoid dust contact with eye and skin.

First Aid Measures in case of irritation: In case of irritation, flush eyes or skin with water for at least 15 minutes.



CAUTION: USE EYE AND EAR PROTECTION

HELPFUL TOOL LISTING PER INSTALLATION METHOD

Nail down

- Appropriate nailer and fasteners ■ Expansion spacers ■ Moisture meter ■ Tapping block ■ Hand tools, Utility knife ■ Hammer ■ Pencil
- Under-cut jam saw ■ Hand saw ■ Circular, miter and jig saw (carbide blade) ■ Tape measure or folding rule ■ Carpenter's square
- Drill ■ Chalk line ■ Calculator ■ Blue masking tape ■ Safety glasses ■ Silicone caulk ■ Transition moldings

Glue down

- Manufactures recommended cleaner ■ 100% Urethane moisture barrier and flooring adhesives ■ Correct trowel size ■ Expansion spacers ■ Moisture meter ■ 2080 blue painters tape ■ Laminate pull or tapping bar ■ Tapping block ■ Hand tools, Utility knife
- Hammer ■ Pencil ■ Under-cut jam saw ■ Hand saw ■ Circular, miter and jig saw (carbide blade) ■ Tape measure or folding rule
- Carpenter's square ■ Drill ■ Chalk line ■ Calculator ■ Blue masking tape ■ Safety glasses ■ Silicone caulk ■ Transition moldings
- 85-100 lb roller

APROVED INSTALLATION METHODS

FLOOR PLACEMENTS	NAIL	GLUE
ABOVE GRADE	yes	Sizes under ¾"
ON GRADE	yes	Sizes under ¾"
BELOW GRADE	no	no
RADIANT HEAT	Selected species	Selected species
SUBFLOOR TYPES		
CONCRETE	no	Sizes under ¾"
GYPCRETE	no	no
OSB ¾" minimum	yes	Sizes under ¾"
PLYWOOD 5/8" min	yes	Sizes under ¾"
PARTICLE BOARD	no	no
ASPHALT TILE	no	no
FIRM LINOLEUM	yes	Sizes under ¾"
FIRM KITCHEN VYNYL	yes	Sizes under ¾"
VCT VINYL TILES	no	no
CUSHION VYNYL	no	no
RUBBER TILES	no	no
STEEL	no	no
CERAMIC/MARBLE	no	Sizes under ¾"
CARPET	no	no
ELASTILON		FLOAT

TO OBTAIN ASSISTANCE WITH FLOORING PRODUCT INFORMATION, PLEASE CONTACT THE STORE OF ORIGINAL PURCHASE OR CONTACT CUSTOMER CARE AT 800-366-4204. VISIT THE "FLOORING 101" or www.lumberliquidators.com FOR INSTALLATION TIPS AND ADDITIONAL WARRANTY INFORMATION.

