



***Thank you for choosing VIRGINIA MILL WORKS  
ENGINEERED Handscraped and Distressed floors!***

**ENGINEERED INSTRUCTIONS**  
Installation methods; Staple-down, Nail-down, Glue-down or Edge-glue and float

Install our wood flooring according to the general installation guidelines as set forth by the (NWFA) The NATIONAL WOOD FLOORING ASSOCIATION [WWW.NWFA.ORG](http://WWW.NWFA.ORG). However, because of various vendor and product requirements the Virginia Mill Works® instructions takes precedence. Virginia Mill Works® denies any responsibility for problems beyond its control such as but not limited to; job-site and subfloor conditions, improper storage, environmental or moisture related issues, installation and tool usage. Where applicable comply with local or International Residential Codes (IRC)

## **CONTENT**

### **Page 2**

**APPLICATIONS  
OWNER/INSTALLER RESPONSIBILITIES  
JOB SITE INSPECTION  
HANDLE WITH CARE  
VENTILATED CRAWL SPACES**

### **Page 3**

**ACCLIMATION/CONDITIONING OF THE FLOORING  
GENERAL INFORMATION  
BOARD PLACEMENTS**

### **Page 4**

**NAILDOWN OVERVIEW  
MOISTURE TESTING  
WOOD SUBFLOOR PREPARATION  
NAILERS/STAPLERS/FASTENERS**

### **Page 5**

**FASTENER SELECTION  
FASTENER SPACING**

### **Page 6**

**NAILDOWN INSTRUCTIONS  
GLUE DOWN OVERVIEW**

### **Page 7**

**CONCRETE SUBFLOOR PREPARATION  
RECOMMENDED AHESIVES**

### **Page 8**

**GLUE DOWN INSTRUCTIONS  
DOUBLE STICK INSTRUCTIONS  
FLOATING INSTRUCTIONS**

### **Page 9**

**MOLDINGS & TRANSITIONS**

### **Page 10**

**HARDWOOD REPAIRS  
SEASONAL CHANGES  
RADIANT HEAT  
ROUTINE MAINTENANCE**

### **Page 11**

**TOOL LIST**

### **Page 12**

**APPROVED UNDERLAYMENTS**

**APPLICATIONS**    **Staple-down, Nail-down, Glue-down or Edge-glue and float.**

Virginia Mill Works® engineered flooring is our most versatile flooring and can be applied on every level of the home. When nailing, engineered flooring is typically installed using specially designed pneumatic wood flooring staplers or cleat nailers, both types work well. Ensure the use of correct sized fasteners and adaptors.

Virginia Mill Works® can be fully-glued to wood subfloors and concrete. Follow the glue manufactures labeling instructions regarding correct trowel size, removal of surface sealers or contaminates and use of moisture barriers.

Virginia Mill Works® can also be edge-glued and floated over a dense pad underlayment or applied over in-floor radiant heat. Specific details are outlined in this document; installations outside these guidelines are viewed as experimental.

**OWNER/INSTALLER RESPONSIBILITIES**

Hardwood flooring is a product of nature characterized by distinctive variations in grain, pattern and color. These **natural variations** are neither flaws or defects, but rather the natural beauty and uniqueness of hardwood, and should be expected. Only stained products will have the most uniformity in color or shade. Before beginning the installation first determine if the job site and subfloor conditions are acceptable. The in-home environment, weather fluctuations and product storage can adversely affect all organic materials including wood flooring (see **acclimation**). The customer/installer is responsible for final inspection of quality. During installation use reasonable selectivity and judgment, any board deemed unacceptable in appearance can be placed in closets, near walls or simply not be used.

Pieces with glaring defects that can be seen **from a standing position** should be cut off or not be used, as **use constitutes acceptance**. Our floors are manufactured in accordance with accepted industry standards that allow a defect tolerance not to exceed 5% of a manufacturing or natural type. If more than **5%** of the material is unusable contact your local store or call **CUSTOMER CARE 800-366-4204** immediately. When flooring is ordered depending on layout or species, about 5% to 10% extra material should be added to the actual order needed for board selection and cutting. Diagonal layouts or custom installations usually require an additional 15%. During installation boards having similar widths should be placed together in the same row to minimize gaps between boards. The use of putty, stains, filler sticks or markers to touch-up prefinished wood during installation is considered normal practice.

**JOB SITE INSPECTION**

To prevent moisture related issues such as buckling or cupping, all **wet trades** involving water or moisture (plumbing, ceramic tiles, drywall finishes, painting, etc.) should be finished with ample time allowed for complete drying prior to wood floor installation. For best performance, wood flooring should be one of the last items installed. **(HVAC)** Heating, Ventilation and or Air conditioning systems should be fully operating and running at least 7 days before delivery. **New concrete** must be cured and at least 60 to 90 days old.

**HANDLE WITH CARE**

**Store product flat**, in a dry level place. Provide air flow under and around cartons. Do not store in **unclimatized buildings**, garages, sheds, directly on bare concrete or next to outside walls. Cartons should be placed close to the center of the installation area as possible. Keep out of direct sunlight and away from heat/air vents. To prevent board warping, twisting or bowing do not cut the plastic support packaged bindings or remove product from the packaging until ready to install.

**VENTILATED CRAWL SPACES**    Per; (IRC) International Residential Code, Section R408.1

Inspect the under-floor crawl space it must have vents for proper **cross-ventilation** (fig a). Venting allows damp areas to dry-out and to minimize moisture build-up under homes. (Exception R408.2; *"Where warranted by climatic conditions, ventilation openings to the outdoors are not required if ventilation openings to the interior are provided."*) Do provide year-round air circulation with multiple vents, a minimum of 1 square foot for each 150 square feet of under-floor space area. One ventilating opening shall be within 3 feet of each corner. Ventilation fans can be used in the crawl space area to circulate the air, promote drying and reduce dead air spaces.

**Ground cover;** under the home in the crawlspace, use black 6-mil polyethylene sheet plastic as a **moisture vapor barrier**. Completely Cover 100% of the surface of the soil to guard against ground moisture. Overlap plastic seams 6" and duct tape seams completely.



(fig a)

### **ACCLIMATION/CONDITIONING OF THE FLOORING**

After harvesting, wood flooring is kiln-dried for optimum service. During transit, delivery and storage, wood flooring must be protected from moisture. Wood is hygroscopic, meaning its size and shape changes with the absorption or release of moisture. The amount of change varies with wood species, cut, and type of flooring. Therefore, controlling wood moisture content (mc) is important for success. First, **acclimate** the new flooring in the areas to be installed to the expected environment that the floor will service while in the boxes. To speed up the acclimation processes or if products are packaged in plastic, open the ends of the boxes. To prevent board warping, twisting or bowing do not cut the plastic support packaged bindings or remove product from the packaging until ready to install. The length of acclimation time is not the determining factor. **The goal** is to reach an indoor equilibrium or balance between the core of the new flooring with its surroundings before assembly, fastening or installation. This balance could be achieved in as little as 1 to 5 days. For best performance, condition and maintain the flooring to consistent indoor temperatures of **60°-80° F** and indoor humidity levels of **30% - 50%**. Depending on your local jobsite situations the use of a **dehumidifier** or a **humidifier** may be necessary to maintain the desired results. **Very dry or humid regions** of the country usually require extended conditioning to balance the wood to the environment it will service. Proper jobsite conditions, acclimation, moisture testing of the subfloor and new flooring all work together for the success of the installation, and is the responsibility of those overseeing the project. Not following the above recommendations can negatively impact board performance and can result in excessive movement, squeaks, board gapping, board-edge cupping, finish and other related issues. This is especially true regarding flooring in seasonal or **vacation homes** without proper indoor climate conditions.

### **GENERAL INFORMATION (all installations)**

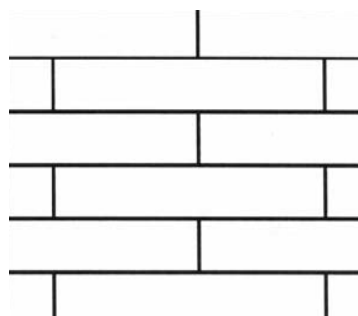
- Customers are advised to be home during the installation for consultation.
- Install flooring in proper lighting.
- Do not install under fixed cabinetry.
- For future questions regarding your product it is helpful to save the item number found on the packaging box ends.
- Customer and installer should discuss installation and layout to maximize satisfaction.
- Inspect flooring during installation.
- Maintain proper perimeter expansion gap.
- Trim bottom of the door frame with handsaw or jamb saw 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)**

Install board randomly. Prevent board ends from lining up row to row by offsetting board ends at least 6". Proper board placement provides greater floor strength and best overall appearance.

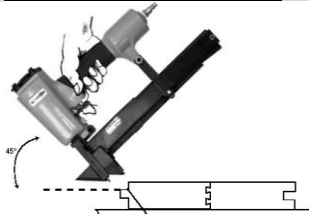


**(fig 1)** Avoid board-end "line up"



**(fig 2)** Avoid "H" Joints

## **NAILDOWN OVERVIEW**



### **[CAUTION] Most wood flooring failures result from jobsite moisture.**

Do not unpack or deliver flooring to the jobsite until moisture problems are corrected.

### **MOISTURE TESTING**

The **goal** of moisture testing is three-fold. To determine when the installation can begin, to verify that you are placing dry flooring on dry subfloors and that the moisture percentage between the new floor boards and that of the existing subfloor is no more than **4**. This is easily accomplished by using a moisture meter such as; ([Tramex](#), [Ligno-Mat](#), or [Delmhorst](#)) to name a few. Adjustable **species specific meters** are most recommended for providing accurate moisture readings. First, **test the subfloor** (Obtain an average by testing 20 locations per 1000sqft) around exterior doorways, near foundation walls and in the center of the room. On average, the subfloor moisture range must not exceed **12%**. Next, **test the new flooring**. (Obtain an average by testing about 3% of the new flooring). Our flooring can have acceptable moisture range between 5% minimum and 11% maximum with no more than 5% variance up to 14%. The ideal moisture range within the new wood flooring is **6%-12%**. If high moisture readings are found in either the new floor or subfloor, postpone the installation, increase ventilation, identify the moisture source and correct. Hold off the installation until the proper conditions have been met. Many installers will document their moisture test readings or results with pictures and notes should future questions arise. **If you are not sure what setting to use on your moisture meter please contact the manufacture of the meter for advice on proper settings.**

### **SUBFLOOR PREPARATION**

#### **Wood subfloors**

Do not install flooring directly over floor joist without subflooring.

All structural panels/underlayment must be installed sealed-side down, and provide minimum  $\frac{3}{4}$ " perimeter spacing. Square-edged or non tongue and grooved panels used as a subfloor will require a minimum  $\frac{1}{8}$ " (3 mm) expansion space placed 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 panel for codes.

- Solid-boards used for subflooring should be  $\frac{3}{4}$ " x 5 1/2" (1" x 6" nominal), Group 1 dense softwoods, No. 2 Common, kiln-dried to less than 12% percent moisture content.
- Particleboard, Luan or Masonite: is not recommended, remove or cover with  $\frac{3}{8}$ " plywood.
- Minimum of  $\frac{3}{8}$ " CDX panel thickness is recommended when used as an underlayment over an existing subfloor.
- Avoid pressure treated plywood for interior use. These can have elevated moisture or latent with rot resistant chemicals.

#### **Note that joist spacing determines minimum subfloor thickness.**

- Joist spacing **16" on center (OC)**  
**Plywood:** Minimum of ( $\frac{5}{8}$ " ) **Oriented Strand Board (OSB):** Minimum ( $\frac{3}{4}$ " , 23/32") **Advantech** Minimum ( $\frac{3}{4}$ " , 23/32")
- Joist spacing **16" up to 19.2" (OC)**  
**Plywood:** Minimum of ( $\frac{3}{4}$ " , 23/32") **Oriented Strand Board (OSB):** Minimum of ( $\frac{3}{4}$ " , 23/32")
- Joist spacing over **19.2" up to maximum 24" (OC)**  
**Plywood:** Minimum of ( $\frac{7}{8}$ " ) **Oriented Strand Board (OSB):** Minimum of (1")

#### **Flatness**

- To minimize squeaks and gaps, the base surface must be flat to within  **$\frac{3}{16}$ " in 6 feet** or within  **$\frac{1}{4}$ " in 10 feet**. Subfloor must be securely nailed or screwed down to joists to minimize 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 subfloor can be an indication of excess moisture or rot, identify and correct. High spots/joist may be 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-in low areas under naildown flooring with cement patching materials, it may break down over time.

**[NAILING TIPS]:**

- **Tongue fracture** and **surface dimpling** during installation can occur 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 fasteners is recommended. 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. Duct tape can also help prevent scratches to the finish from the nailer.
- 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 **engineered wood floor adhesives** rather than nailers. Do not use water base adhesives. Do not use significantly bowed, crooked or twisted boards that cannot be nailed in place. When nailing 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.

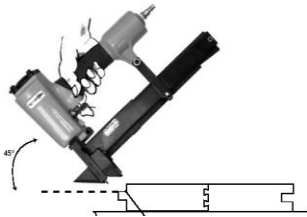
**ENGINEERED WOOD FASTENER SELECTION**

**Special nailers, shims, shoe accessories or fasteners are usually required to accommodate engineered flooring**

**Note:** Only use flooring machines that are fully adjustable and that engage the top profile over the tongue at the appropriate angle. Make sure that the base is smooth, in good working condition and seats properly against the board to prevent top edge and surface dimple damage. Test and adjust the air pressure to ensure proper setting of staples. Always install in good lighting.

**STAPLER (examples)**

<a href="#">Norge 18g floor stapler</a>	(Pneumatic)	1" - 1 1/4" long	800-366-4204
<a href="#">Bostich LHF97125-2-20</a>	(Pneumatic)	1" - 1 1/4" long	800-556-6696
<a href="#">SPOTNAILS WS4840W2</a>	(Pneumatic)	1" - 1 1/4" long	800-323-1653
<a href="#">PORTA-NAIL 18g floor stapler</a>	(Pneumatic)	1" - 1 1/2" long	800-634-9281
<a href="#">POWERNAIL 20FS 20g floor stapler</a>	(Pneumatic)	1" long	800-323-1653



18-20 gage Staples 1"- 1 1/4" long

**CLEAT NAILER (example)**

[Powernail Model 200p/250m/50p/50m](#) (Pneumatic) Cleat nails 1"- 1 1/4" long

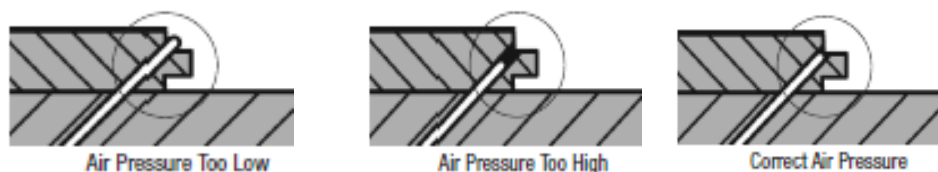


18-20 gage Cleat nails 1"-1 1/4" long

**FASTENER SPACING**

Place fasteners **3"- 4"** apart (for staples), **4"- 6"** (for nails) and within 1- 2" from each end with at least two fasteners

**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.



**Note: Only use flooring stapler/nailers that are fully adjustable and that engage the top profile over the tongue at the appropriate angle. Make sure that the flooring stapler/nailer is in good working condition and seats properly against the board to prevent top edge and surface dimple damage. Any damage caused by fasteners or nailers is not covered by the warranty.**

### **NAILDOWN INSTRUCTIONS**

#### **Starting point, first three rows**

• When installing over crawl spaces or rooms over basements use 15 lb. black roofing paper or Silicone vapor shield paper to provide some protection against moisture vapors, butt seam edges together.

Install the flooring perpendicular to the floor joist. Use the longest, straightest boards available for the first two rows.

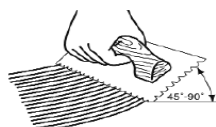
- (1) Determine the starting wall. At the two opposite ends of this wall, measure out and mark the floor the width of the floor plus the expansion gap. The **Expansion gap** is normally the same as the thickness of the new flooring, for example, 1/2" flooring will require 1/2" expansion.
- (2) Snap on 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.

### **GLUE DOWN OVERVIEW**



**[CAUTION] Most installation failures result from jobsite moisture.**

Do not unpack or deliver flooring to the jobsite until moisture problems are corrected.

Note that wood flooring adhesives may have special requirements and limitations of use. Follow closely the adhesive labeling instructions and advisories pertaining to it (moisture testing procedures are necessary, if moisture barriers are required or limits of use and trowel size recommendations). Depending on the selection and application of a particular adhesive, you may be required to test for concrete moisture and or to use moisture barriers. When in doubt about an adhesive application or requirement call the adhesive manufacturer. **Not following the adhesive manufacturer recommendations of the products selected for use can lead to installation failure or product damage and will void your warranty.**

#### **[TIPS]:**

- 1 Glue manufacture may require rolling the floor throughout installation to ensure glue transfer, refer to adhesive labeling instructions
- 2 For the best results, do not mix adhesive products.
- 3 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.
- 4 During constant use trowel teeth will wear down. For best glue coverage use a new trowel with each new container of adhesive.
- 5 Discard twisted or warped boards.
- 6 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.
- 7 Mix wood from several cartons as you install the floor to insure color, grain and shade mix.
- 8 Install the flooring parallel to the longest wall in the room. Keep the flooring straight using a chalk line.
- 9 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 board rows at 18" intervals. (Incorrect or aggressive tape can harm the finish, do not leave on overnight)

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

**[CAUTION]: 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 the manufacturers recommended remover. Use clean towels, changing frequently to prevent haze and adhesive residue.

### **SUBFLOOR PREPARATION**

#### **Concrete substrates**

Because concrete generally takes 15 days to dry for every 1 inch (25 mm) of thickness, the concrete must be between **60 to 90 days old** prior to installation and free of surface sealers or contaminants.

#### **Flat concrete**

• A flat cement surface is very important when gluing down ridged solid wood. To minimize squeaks and gaps the final surface must be flat to within **1/8" in 6 feet** or within **3/16" in 10 feet**. 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



### **Recommended Adhesives**



[www.mapei.com](http://www.mapei.com)

**Mapei Eco 975** adhesive

**Mapei ECO 980** adhesive

**Mapei ECO 995** 2-in-1 urethane adhesive and Moisture Vapor Protection

Limits; Up to 15lbs of elevated concrete moisture or 85% relative humidity

**Technical Services 1-800- 992-6273, 1-800-876-2734 (USA) 1-800-361- 9309 (Canada)**



[www.bostik-us.com](http://www.bostik-us.com)

**Bostiks BBA** adhesive

**Bostiks DuraGrip** adhesive

**Bostiks MVP** Moisture Vapor Protection

**Bostiks Seal-N-grip** 2-in-1 urethane adhesive and Moisture Vapor Protection

Limits; Up to 15lbs of elevated concrete moisture or 85% relative humidity

**Technical Services 1-800-523-6530, 1-800-726-7845, 1-888-592-8558**

**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) **Clean off any adhesive that may be on the floor finish. Check with adhesive manufacture for proper adhesive remover product.**
- (8) Use #2080 painters tape to hold planks together until glue cures. Remove tape after 24hrs.
- (9) Repeat steps 1-8. Chalk new lines, spread adhesive and continue working 4 or 5 rows together until completed.

**INSTALLING THE LAST ROWS****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**

- Look over floor to make sure all adhesive has been removed from the finish of the flooring.
- 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.

**DOUBLE STICK INSTALLATION – Flooring glued over an approved underlayment that is also glued to the subfloor)**

Approved underlayments - [Bellawood Premium](#), [Eco Silent Sound](#), [Insulayment](#), [Cork](#)

Allow the underlayment to fully cure before gluing wood flooring to the underlayment

**FLOATING FLOOR INSTRUCTIONS**

During installation, **Carpenters wood glue** should be applied to each groove on the short and long sides of the planks to ensure bond with the other planks. Two separate continuous beads of glue should be applied: one continuous bead applied inside the groove, and one continuous bead applied to the top part of the tongue at all seams to ensure a secure bond with the top and bottom of the tongue. This double-gluing helps to minimize board gaps or separation. Note that seasonal gapping is normal in wood flooring and does not constitute a product failure. Seasonal gapping can be minimized by the acclimation recommendations provided on page 1.

**Floating floor expansion**

Perimeter expansion space for room areas 30'x30' and under is 1/2". Room areas exceeding 30'x30' expansion space is 3/4"

No spans or connected flooring can be greater than 40' in any direction without an expansion break. A connected area is defined as all room areas using the same flooring, connected. Expansion breaks can be placed in doorways, between rooms or hallways. Expansion breaks can be hidden using T- type expansion moldings.



- (1) Complete floor preparation as earlier outlined, next install a **moisture barrier** (6-8mm sheet plastic) over cement, kitchen vinyl and ceramic tiles. Omit plastic moisture barrier when installing directly over bare wood subflooring.
- (2) Install recommended underlayment such as: **Bellwood Premium underlayment, Eco Silent Sound HD, Quiet Walk, Insulayment or Cork.**
- (3) The flooring should be installed from left to right, tongue side towards to wall, with the groove sides facing out from the wall.
- (4) Starting in one corner of the room, lay the first row of planks flat and against ½" spacers. (During installation, spacers provide the necessary space required for **expansion** around the perimeter of the floor. It is especially important to leave at least ½" free around the entire floor). Planks can be elevated at a slight angle to allow the tongue to slip into the groove of the first plank. Once flat, push and gently tap the planks together until they lock tightly, use a **tapping block** if necessary.
- (5) When edge-gluing, ensure that the glue is still wet when the planks are joined. Special attention should be paid to ensure that there is no excess glue dripping to the subfloor as this could bond the plank to the underlayment and hamper floor movement. Keep the surface clean using a damp clean rag.
- (6) For the second and consecutive rows, elevate the plank at a slight angle along its length to allow the tongue to slip into the groove. The next plank should be laid the same way but, with the tongue on the left side of the plank falling just next to the previous plank. Once flat, push down and gently tap the planks together until they lock-in without any visible joint between the planks. **Blue painters tape #2080** can be used to keep board ends together until the adhesive has cured. (Not using the correct tape can harm the finish)
- (7) **Complete to floor:** When you reach the final row, place a loose board precisely on the last laid panel. Trace a cutting mark and allow for a ½" expansion. Next, Lay the board you cut and ease it into position. Insert spacers between the wall and the last panel laid to be sure there is an ½" expansion gap.
- (8) To pass obstacles through the floor covering (pipes, radiator mounts), use a pencil to trace the center position for drilling. Use a big enough drill bit to leave a ½" expansion around the pipe. Next, cut the strip in two so that the saw mark goes through the center of the drilled hole, so that the strip can be glued and reassembled around the pipe.

#### Post-installation

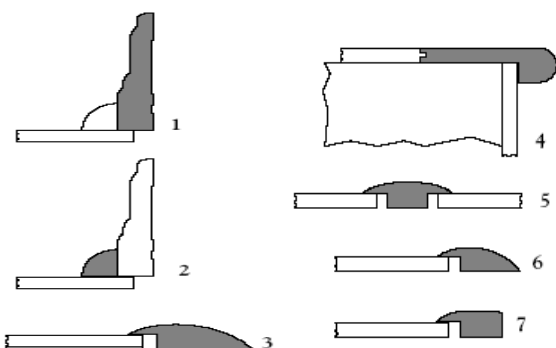
- After installation, allow glue to fully cure for 24hrs before replacing furniture and foot traffic
- For matching milling and finish sheen, save a box of flooring in case of future repairs.

#### MOLDINGS & TRANSITIONS:

##### Installation Tips:

- Moldings must be predrilled to avoid splitting whenever they are to be secured with nails or fasteners.
- 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.
- On wall base or quarter round moldings, never restrict the hardwood floor's natural contraction/expansion movement by driving the fasteners at a downward angle into the floor. Attach the moldings to the wall or vertical surface.
- When splicing, miter cuts hide better than square cuts.

- 1) **Base Board** - for adding a custom finish along any wall.
- 2) **Quarter-Round** - for covering the expansion gap left at walls and other fixed surfaces.
- 3) **Reducer Molding** - used as a transition strip to lower floors.
- 4) **Stair Nosing** - for finishing the exposed edges of stairs and landings.
- 5) **T-Expansion** - for joining two areas of flooring together of similar heights.
- 6) **Reducer Molding** - thinner strip, used as a transition strip to lower floors.
- 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 30-50% 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 (all installation methods)**

**General Precautions and Recommendations** Always use moisture barriers.

Engineered flooring can be successfully applied over in-floor radiant heat. Know the species you intend to use and how it may interact with radiant heat. Not all species are recommended for this installation, choose species highest in stability ratings for this application.

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 30-50% 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 30% and 50%** 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 edge-gluing together planks over radiant heat, two separate continuous beads of glue should be applied: one continuous bead applied inside the groove and one continuous bead applied to the top part of the tongue and at all seams to ensure a secure bond with the top and bottom of the tongue. This double-gluing helps to minimize board gaps or separation. Humidity related gapping should be expected and does not constitute a product failure.
- (2) When nailing planks over radiant heat ensure that fasteners are holding the flooring without damage to the radiant system.
- (3) When fully gluing planks over radiant heat ensure that the adhesives are recommended for this application.

**ROUTINE MAINTENANCE and PROTECTION****Do**

1. Sweep, dust, or vacuum the floor regularly with a recommended floor attachment (**not a beater bar**) to prevent accumulation of dirt and grit that can scratch or dull the floor finish. A more frequent dust-mopping or vacuuming schedule may be required in very sandy areas such as a beach home.
2. Periodically clean the floor with **manufacturers cleaning products** or products made specifically for urethane finishes; never use oil soaps, detergents or wax.
3. Use a **damp cloth** to blot up spills as soon as they happen.
4. For tough spots, such as oil, paint, markers, ink, or tar, apply **mineral spirits** on a clean white cloth then wipe the area with a damp cloth to remove any residue.
5. 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.
6. **Entry mats** will help collect the dirt, sand, grit, oil, asphalt, or driveway sealer or pool chlorines that might otherwise be tracked onto your floor.
7. Keep your **pet's nails** trimmed to prevent them from scratching your floor.
8. **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.

9. Use a **dolly** when moving heavy furniture or appliances; use a piece plywood or Masonite to protect the floor. Never try to slide or roll heavy objects across the floor.
10. Use **floor protectors** under desks and wide-load bearing rollers to minimize indentations and scratches from heavy objects such as office desk chairs. As a rule, the heavier the object, the wider the floor protector.
11. Maintain a normal indoor relative **humidity level** between 30%-50% and **temperatures** of 60°-80° throughout the year to minimize the natural expansion and contraction of the wood.
12. Rug pads should be breathable, use material such as felt, cotton, jute, plank, and PVC based.

#### Do not

1. Do not wash or **wet mop** the floor with soap, water, oil-soap detergent, or any other liquid cleaning material. This could cause swelling, warping, delamination, and joint-line separation, and void the warranty.
2. Do not use steel wool, abrasive cleaners, or strong **ammoniated** or chlorinated type cleaners.
3. Do not use any type of buffing or **polishing machine**, these can generate heat or hot spots.
4. Do not use rubber, foam or **plastic backed mats** as they may discolor the flooring finish. Do not use mats with sticky backings. To prevent slippage, use an approved rug underlayment.
5. Avoid excessive exposure to **water** during periods of inclement weather.
6. Do not walk on the 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. Lumber Liquidators does not endorse the use of **steam cleaning** machines on hard wood products, use at your own risk.
9. Toys and tools can scratch the finishes, **scratches and dents** are jobsite related, not warrantable.
10. If using glue-down or floating installation methods, do not allow foot traffic or heavy furniture on floor for 24 hours.



#### **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 ■ proper moisture barrier and wood 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

##### Floating

- Carpenters wood glue (PVA), Tite-bond or Lumber Liquidators tongue and groove adhesive ■ Appropriate underlayment –Cork, Quiet Walk or Insulayment ■ Clean rags and a bucket of clean water ■ 6-8 mm sheet plastic moisture barrier ■ 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

**APPROVED UNDERLAYMENTS FOR SOLID WOOD**

Depending on application, our flooring can be installed (nailed, glued or floated) over an approved underlayment to meet the needs of customers, building specifiers and condominium associations desiring greater thermal insulation and sound isolation qualities. When placing over any approved underlayment, pad or cushion there can always be slight deflection or movement with a minimal amount of friction, squeaks or floor noise, especially in nailed-down applications. Note that some floor noise is normal and will vary from one installation type to the next depending on sub-floor type, subfloor flatness, sub-floor deflection, species and type of flooring material, the fasteners used, relative humidity and the amount of topside pressure applied to the flooring material. For these reasons, floor noise is not considered a product defect.

Refer to footnotes

**UNDERLAYMENT APPLICATIONS**

<b>UNDERLAYMENT - paper</b>		<b>NAIL</b>	<b>GLUE</b>	<b>FLOAT</b>
red rosin paper	Good	yes	no	optional
15 lb felt paper	*Better	yes	no	optional
White Silicon Vapor Shield® paper	*Best	yes	no	optional
*plastic poly-sheeting - over cement		no	no	yes
<b>UNDERLAYMENT - pad</b>				
*Bellwood Premium	(film side up)	yes #†	yes	yes
*Eco Silent Sound	(film side down)	yes #†	yes	yes
Dream Home Insulayment	(smooth side up)	yes #†	yes	yes
Dream Home Cork	(smooth side up)	yes #†	yes	yes
Elastilon Underlay System	(film side up)	no	no	yes #
Requires PVA wood glue applied to the short ends				
Requires plastic poly-sheeting over cement				
Allows floating installations over radiant heat				

\*Offers Moisture Vapor Protection, #Flooring (over) 5/16", †Flooring (minimum) 3/8"x 3" wide

**SOLID WOOD APPLICATIONS**

<b>FLOOR PLACEMENTS</b>	<b>NAIL</b>	<b>GLUE</b>	<b>FLOAT</b>
ABOVE GRADE	yes	yes	yes
ON GRADE	yes	yes	yes
BELOW GRADE	yes	yes	yes
<b>SUBFLOOR TYPES</b>			
CONCRETE	no	yes	yes
GYPCRETE	no	no	yes
OSB 3/4" min	yes	yes	yes
PLYWOOD 5/8" min	yes	yes	yes
PARTICLE BOARD	no	no	yes
ASPHALT TILE	no	no	yes
FIRM LINOLEUM	yes	yes	yes
FIRM KITCHEN VYNYL	yes	yes	yes
VCT VINYL TILES	no	no	yes
CUSHION VYNYL	no	no	no
RUBBER TILES	no	no	no
STEEL	no	yes	yes
CERAMIC/MARBLE	no	yes	yes
CARPET	no	no	no

**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, **USE EYE AND EAR PROTECTION.**

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

TO OBTAIN ASSISTANCE WITH 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](http://www.lumberliquidators.com) FOR INSTALLATION TIPS AND ADDITIONAL WARRANTY INFORMATION.