



Xulon Engineered Hardwood- T&G Installation Guide

Engineered Hardwood

Installer/Owner Responsibility

Fact: The veneers on bamboo and hardwood are a product of nature and will have some variations in grain, patterns, and shade/color from carton to carton. Owners be sure to order 5% to 7% more flooring to allow for any cuts and grading allowances and for any diagonal installations, add 15% more for waste.

- Prior to installation, owners and installers should inspect the flooring material boxes to verify that the vendor information matches and for any manufactured defects in the material itself. Should any board be deemed unacceptable then it should not be used for the installation. Defects on the surface of the planks can be trimmed and the remainder of the plank used which is expected to minimize waste. If there are any concerns with the quality of the product, then the installation should be stopped immediately, and the owner should contact Xulon.
- Engineered flooring is manufactured in accordance with industry standards which allows a tolerance of up to 5% in manufacturing and natural deficiency for the total installation.
- Prior to installation, it is the responsibility of the installer to determine if the jobsite environment, subfloor and subsurface conditions meet or exceed all requirements outlined in the installation guide.
- All wood expands and contracts continually until moisture equilibrium has been reached in the area it has been installed. Owners can minimize this natural occurrence by keeping the relative humidity consistently maintained year-round. A dehumidification and/or humidification system may be necessary in the home to maintain the prescribed relative humidity conditions.
- Any work that involves water or moisture to include plumbing, masonry, painting, plastering must be completed prior to the flooring being delivered as well as any exterior installations of doors, windows, gutter downspouts and permanent HVAC systems in operation. The exterior grading and building envelope must be completed.
- Necessary precautions should be taken to protect the floors from any other trade work that is occurring during installation of the floors. The use of clean, dry, plain uncoated cardboard or Kraft paper to cover the floors as inks from printed cardboard could damage the floor. Installers and owners should never cover them with plastic, red rosin, felt, wax paper or previously used cardboard.
- Prior to covering the floor, it should be thoroughly cleaned to ensure the removal of grit and debris that could potentially damage the finish. It must be completely covered to eliminate uneven ambering from exposure to UV light.

- The room temperatures in the home should be 60-80°F with the relative humidity between 35-55% which are pre-installation requirements and must be maintained for the life of the product.
- The HVAC system is required to be in operation for a minimum of 14 days prior to any moisture tests being performed or installation.
- There are two distinct humidity seasons that affect the building interiors which are Heating and Non-Heating.
- Heating season creates dry, low humidity conditions so it is recommended that humidifiers be used to prevent any excessive shrinkage or gapping in the wood floors due to the periods of low humidity.
- Non-Heating season as well as Coastal or Waterfront Areas creates wet, high humidity conditions so an air conditioner or dehumidifier should be used to maintain the proper humidity levels.
- Failure to maintain the interior environment could result in gapping, squeaking, buckling or cupping.
- Xulon declines any responsibility for product or installation failure that has been caused by subfloor, jobsite, substrate or environmental deficiencies.
- The flooring warranty does not cover materials that have visible defects once they have been installed as installation is an acceptance of product quality.
- Xulon's warranty does not cover the natural expansion and contraction that results in the separation between planks as seasonal gapping is not considered a manufacturing defect or damage caused by excessively low or high humidity.
- Never install this flooring in full bathrooms.
- The installer should provide the owner with one carton end label from the flooring being installed along with the pre-installation moisture content readings for future reference which the owner should retain for their records with their invoice.
- Any excess flooring should be retained by the owner and stored in a climate controlled area in the event of a future repair or any damage to the floor.
- It is a normal practice and a routine part of installation for installers to use a stain, filler or putty for any touch ups or corrections.

Basic Tools Needed:

- Safety Glasses
- NIOSH approved Dust Mask
- Wood/Concrete Moisture Meter both
- Broom or Vacuum
- Chalk Line
- Starting Row Wedges
- Tapping Block
- Pry Bar or Trim Puller
- Tape Measure
- Pencil
- Jamb Saw
- Miter Saw

- Table Saw
- Utility knife
- Appropriate Adhesive Trowel
- Low Adhesion Painter Tape
- Coordinating stain, filler, or putty
- Plastic Scraper
- Mineral Spirits (odorless)
- Terry Towels
- Thick Felt Protectors
- Pull Bar
- Putty Knife
- Carpenters Square

Adhesives and Patches/Levelers

Call Xulon for recommended adhesives and/or patches and levelers. Use of any other adhesive and/or patch/lever that is not recommended by Xulon will not be covered under the warranty and Xulon will not take responsibility.

Jobsite Conditions

- The building or home should be enclosed with all doors and windows properly installed.
- Any wet work to include painting, drywall, tiling, concrete and masonry must be completed with an ample amount of time to dry prior to the flooring being delivered.
- Basements, garages and crawlspaces must be dry and well ventilated with the crawlspace having a minimum 18" between the bottom of the floor joist to the ground and a minimum of a 6mil thick polyethylene film covering the entire crawlspace ground.
- Exterior gutters should be installed and functioning properly as well as the yard grading sloping to run any water away from the homes foundation.
- Prior to the flooring material being delivered, the HVAC Systems should be in operation for a least two weeks.

Subfloor Preparation

Engineered hardwood floors can be installed over any subfloor that is flat, clean, dry and structurally sound on all grade levels. The recommendations given are not intended to supersede federal, state or local building codes. It may be required to modify the existing structural components for a successful installation as hardwood flooring is not a structural component. The warranty does not cover against loss that has been caused by inadequate subfloors, flooring substructures or improper installation of the substructures.

- Subfloors are required to be dry and clean and free of dirt, curing compounds, drywall mud, wax, paint, oil, sealers, adhesives and other debris which can be removed mechanically.
- Never install over chemically cleaned substrates.

- All subfloors must be flat and smooth within 1/8" in 6 feet or 3/16" in 10 feet and should any low spots need to be filled with a high compressive strength at a minimum 3000 psi as well as sand high areas and joints.
- Wood Subfloors must be structurally sound so any areas that are loose or squeak must be secured with either nails or screws.
- The wood panels must exhibit an adequate fastening pattern whether it is glued, screwed or nailed per the system's requirements in an acceptable nailing pattern.
- The typical pattern is 6" along the bearing edges and 12" along the intermediate supports while flattening edge swell as necessary.
- All water-damaged, swollen or delaminated subflooring or underlayment must be immediately replaced.
- Installers should, whenever possible, install flooring perpendicular to the floor joists for maximum stability since building codes require structural support components of flooring systems which may not provide an adequate rigidity and support for the proper installation and overall performance of a hardwood floor.
- Concrete subfloors must be a minimum of 30 days old from construction within accordance of ASTM E1745.
- The concrete substrate must be level with any cracks, holes and low spots filled in with an approved cement patch or leveling compound.
- Burnished or steel troweled concrete substrates are required to be inspected for porosity by placing a few drops of water on the surface and if the water is not absorbed within 3 minutes than the substrate should be labeled as non-porous.
- If the substrate is labeled non-porous than the surface must be abraded with 30 grit sandpaper until porosity is achieved.
- Concrete must have a rating of 3000 psi or greater for a glue down application of hardwood floors, anything less than 3000 psi is not permitted due to the concrete being lightweight.

Substrates

Concrete

- All concrete substrates must be cured fully for a minimum of 60 days.
- All concrete substrates should be tested for IRH (Internal Relative Humidity) in accordance to ASTM F 2170. Calcium Chloride tests may be conducted in addition to IRH and must be performed per the latest edition of ASTM F 1869. Calcium Chloride test results cannot exceed 3lbs per 1000 sq ft in 24 hours. The Internal Relative Humidity In-Situ probe test should not exceed 75%.
- New and Existing Concrete Subfloors should meet the Guidelines of the latest edition of ACI 302 and ASTM F 710, "Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring" available from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428; 610-832-9585; <http://www.astm.org>.
- Engineered hardwood flooring is not recommended for installation over lightweight concrete subfloors and to test for lightweight or acoustical concrete, owner and installers can scrape a coin or key across the surface.

- Should the surface powder easily or has a dry density of 100 pounds or less per cubic foot than the glue down method of installation should not be used for the engineered flooring but rather installed using the floating method of installation.
- All concrete subfloors are required to have a moisture barrier with all engineered hardwood floors.

Wood

- Joist spacing is used to determine the minimum subfloor thickness.
- Joist spacing 16" on center (OC) Plywood: Minimum of (5/8") Oriented Strand Board (OSB): 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")
- Any approved underlayment floor panels must meet or exceed the following below:
 - Plywood: Must be minimum CDX grade (exposure 1) and meet US Voluntary Product Standard PS1 performance standard or Canadian performance standard CAN/CSA 0325-0-92. The preferred thickness is 3/4" (19 mm) as a sub-floor [minimum 5/8" (16 mm)] or 3/8" (9.5 mm) as floor panel underlayment.
 - Oriented Strand Board (OSB): Conforming to US Voluntary Product Standard PS2 or Canadian performance standard CAN/CSA 0325-0-92 construction sheathing. Check underside of panel for codes. When used as a sub-floor, the panels must be tongue and groove and installed sealed side down. Minimum thickness to be 23/32" (18 mm) thick when used as a sub-floor or 3/8" (9.5 mm) as floor panel underlayment.
 - Wafer board and Chipboard: Conforming to US Voluntary Product Standard PS2 or Canadian performance standard CAN/CSA 0325-0-92. Must be 3/4" (19 mm) thick when used as a sub-floor and 3/8" (9.5 mm) thick when used as floor panel underlayment.
 - Particleboard: Must be a minimum 40-lb. density, stamped underlayment grade and 3/4" (19 mm) thick. (Floating installation only)
- For solid wood subfloors that will use the direct glue or staple down installation method:
 - Minimum 3/4" (19 mm) thick with a maximum width of 6" (15 cm) installed at a 45° angle to the floor joists.
 - Group 1 dense softwood (Pine, Larch, Douglas fir, etc.) No. 2 common, kiln dried with all board ends bearing on joists.
 - For direct glue-down applications add 3/8" (9.5 mm) approved floor panel underlayment.
- For existing wood flooring that will use the direct glue or staple down installation method:
 - Existing engineered flooring must be well bonded/fastened. When gluing over existing wood flooring, the surface finish must be abraded or removed to allow adequate adhesive bond.
 - Existing solid hardwood flooring that exceeds 6" (15 mm) in width must be covered with 3/8" (9.5 mm) approved underlayment and fastened as required.
 - Do not install over solid or engineered flooring attached directly to concrete.
- The wood subfloors must be nailed properly with ring shank nails or secured with counter sunk screws.

- All wood subfloors need to be structurally sound so if subfloor panels are a single layer, less than 3/4" thick, add another single cross layer for strength and stability for a minimal 3/8".
- The sealed side must be installed down on all underlayment floor panels and when used as a subfloor, must allow 1/8" expansion space between each panel. Any inadequate spacing can be cut in with a circular saw but do not cut in expansion space on tongue and groove panels.
- If installing parallel to the floor joists, it might be necessary to increase the rigidity of the structural subfloor by installing an additional minimum of 3/8" approved underlayment floor panel.
- Pressure treated plywood is not for interior use as it may have elevated moisture or latent with rot resistant chemicals.
- For the floating installations, Particleboard, Luna or Masonite is approved and must be covered with a minimum of 3/8" CDX plywood when gluing this material to the subfloor.
- Installers should never install over existing plywood subfloors that have been directly installed over concrete without the proper moisture protection between the plywood and concrete.
- Wood flooring should be nailed perpendicular to the floor joist, but it is possible to nail it parallel to the floor joist by using a combination of plywood, OSB, Advantech or similar approved subfloors.
- Floor joist (16" to 19.2" oc) The total subfloor thickness minimum must be 1-1/4".
- Floor joist greater than (19.2 up to 24" oc) The total subfloor thickness minimum must be 1-7/16".

Other Subfloors

- Unacceptable underlayments that must be removed if installed are perimeter glued resilient vinyl and rubber tiles.
- Suitable subfloors are terrazzo, vinyl, resilient tile, cork and linoleum or hard surfaces, but they must be dry, structurally sound and level while the surface must be sound, tight and free of paint, oil, existing adhesives, wax, grease and dirt. To assure adhesion, terrazzo and ceramic tile are required to be scuffed.
- Warning! Do not sand existing resilient tile, sheet flooring, backing, or felt linings. These products may contain asbestos fibers that are not readily identifiable. Inhalation of asbestos dust can cause asbestosis or other serious bodily harm. Check with local, state and federal laws for handling hazardous material before attempting the removal of these floors.

Radiant Heat

- When installing a multi-layered core product, it is of the utmost importance that these guidelines are followed strictly and failure to do may result in unsatisfactory results.
- Prior to installation of hardwood flooring over radiant heat subfloors, it must be determined if the radiant heat system is rated as compatible with the flooring as it is highly recommended that the radiant heat system has been designed to specifically accept hardwood flooring.

- For radiant heat systems that have been designed for floor coverings with a higher resistance to heat transfer such as carpet will damage wood flooring and single heat circuit systems that have been designed for use with multiple floor coverings have to be adjusted to work at temperatures that are suitable for hardwood flooring.
- It is required for an in-floor temperature sensor and a separate thermostat for the room. An outdoor temperature sensor must be used to properly adjust water temperature based on the anticipated heat loss.
- Prior to installation of the flooring over radiant heat, the heat must be turned off and installers must wait until the floor has reached room temperature of 70°-75°F.
- The subfloor temperature should never exceed 85°F (29°C) and 24 hours after installation, a gradual increase in temperature should be in increments of 5° F per hour to avoid overheating.
- It is extremely important to operate the radiant heat system that has been installed in concrete, mortar beds or gypsum cement until they are completely dry prior to installation which can take up to several weeks.
- The HVAC system should also be in operation to allow the humidity levels to stabilize (35- 55% RH) in the area that the hardwood floor will be installed.
- Hardwood must acclimate to that humidity level prior to installation so that it will minimize dimensional changes due to moisture.
- Areas rugs should never be installed on top of an engineered floor that has radiant heat systems as the rugs trap heat and can create temperatures capable of damaging the engineered flooring.

Moisture Testing

1. The first test should be the flooring veneer moisture content in which at least 20 planks per 1000 sq ft of flooring should be tested using the meter manufacturers recommend setting for engineered flooring and calculate the average moisture content of all 20 readings.
2. The second step is the test the wood subfloor moisture by setting the meter to the recommended setting for the specific type of subfloor and make sure to check with the meter manufacturer for specific settings. Installers should test 20 different locations per 1000 sq ft area and then calculate the average moisture content in which the moisture should never exceed 12%. If the subfloor is concrete than this step can be skipped.
3. The third step for wood subfloors is that it is recommended that prior to installation starting that the veneer moisture content is within 4% of the average wood subfloor moisture content. The flooring should never exceed 12% moisture content, or the installer needs to extend acclimation time until these conditions have been met. It is recommended that the owner document and save the moisture testing results.
4. For concrete subfloors, the recommendation for installation to start is when the veneer moisture content is within 5% to 9% on average.

Concrete Moisture Testing

- The User is responsible for moisture testing all concrete substrates regardless of the grade level or age to verify that acceptable limits of moisture are acceptable to the adhesive being used. Concrete slabs need to have cured for a minimum of 90 days prior

to any moisture tests being performed and should moisture levels not be within the acceptable limits shown than the flooring cannot be installed.

- Follow moisture testing and procedure guidelines established by the adhesive manufacturer
- Only two moisture test methods are acceptable: The Relative Humidity (RH) test or the Calcium Chloride (CC) test
- The use of moisture meters, plastic sheet tests and/or bond tests are not acceptable quantitative test methods by industry standards
- For use of the Relative Humidity (RH) test-follow the ASTM F 2170, Standard and for use of the Calcium Chloride (CC) test-follow the ASTM F 1869 Standard (Moisture Vapor)
- It is strongly recommended that users document and save all acceptable testing results

Installation

Glue Down Installation Method

- The glue down installation method only applies to concrete subfloors.
- Should an excess subfloor moisture issue exist than it is required that an approved adhesive be applied using the provided clip-on trowel provided with each pail which is necessary for warranty compliance for products with equal or greater specifications.
- If the RH readings are 95% than the use of the Clip-On Trowel Blade provided and attached to the top of each pail which must be replaced with each pail of adhesive used or more frequently as wear dictates. The floors pH must never exceed 11.
- If the RH readings are less than 80% than the use of a 3/16" x 1/4" x 1/2" Flat V Notch Trowel is recommended, and these trowels should be replaced every 300 sq ft or sooner if excessively worn. The floors pH must never exceed 11.
- The application rate can vary based on the substrate conditions and coverage is based on the application of the adhesive to a clean, smooth concrete substrate.
- Do not apply over self-stick tile, sheet vinyl, old adhesives, metal, linoleum, laminate, particleboard or strip-wood subfloors without using an approved wood or wood composite underlayment to cover it first.
- The adhesives are required to be used in its entirety when opened as the lid does not reseal and the temperature and humidity will affect the curing time which means the higher the temperatures and humidity than the faster the cure.
- **Adhesive Application Instructions**
 1. 72 hours before, during and after installation, the temperature and humidity must be regulated.
 2. The adhesives should be spread with the recommended trowel to ensure 95% to 100% adhesive contact.
 3. When the flooring is pressed firmly into the adhesive immediately after troweling is referred to as the wet-lay method. If the flooring is pressed firmly into the adhesive after it has developed its initial grab which typically is 15 to 20 minutes is referred to as the walk-on method. Follow all guidelines set by the adhesive manufacturer as well as the flooring manufacturer as not following them can void the flooring warranty.

4. Any adhesive smudges or drops must be removed immediately as it becomes very difficult to remove once allowed to dry and tools should be cleaned while the adhesive is fresh using clean white terry cloth towels, a urethane adhesive remover or mineral spirits.
 5. For a minimum of 12 hours, owners should avoid light/regular foot traffic and heavy foot traffic for a minimum of 24 hours.
- **General Information of Glue-Down Installations**
 1. Correct any substrate imperfections by using cement-based patch or skim coat leveling products.
 2. 72 hours before, during and after installation, the temperature and humidity must be regulated.
 3. Install and secure started row and then spread adhesive using the recommended trowel to ensure 95% to 100% contact.
 4. If the wet lay method is used, after the flooring has been place, roll the entire installation with a 75lb smooth roller.
 5. Any adhesive smudges or drops must be removed immediately as it becomes very difficult to remove once allowed to dry and tools should be cleaned while the adhesive is fresh using clean white terry cloth towels, a urethane adhesive remover or mineral spirits.
 6. For a minimum of 12 hours, owners should avoid light/regular foot traffic and heavy foot traffic for a minimum of 24 hours.
 7. The room that the installation is occurring must have proper ventilation and installers can use an electric fan to help ventilation.
 - **Wet Lay Method**
 1. Installers should pick a starter wall and it is recommended to begin the installation along an exterior wall due to it providing a more straight and square lay pattern with the room. They should then measure out from the wall the width of two planks plus the 3/8" expansion and mark it at each end of the room and then snap the chalk line.
 2. The adhesive should be spread from the chalk line to the starter wall with the recommended trowel size at 45° to allow for the proper spread of adhesive applied to the subfloors which should produce a proper and permanent bond. Any improper bonding can cause loose or hollow spots.
 3. The first row of starter planks must be installed with the tongue facing the starter wall and secured into position where the alignment is critical for a straight edge and should be secured along the chalk line or by top nailing the first row with finishing nails if it is a wood subfloor or adjustment spacers for a concrete subfloor which helps prevent slippage and misalignment of the planks.
 4. To maintain a consistent expansion space of at least 2", some planks along the wall may have to be scribed and cut to fit since most walls are not straight.
 5. After the starter rows have been secured, spread 2 ½ to 3 feet of adhesive the length of the room and then place the tongue into the groove of the plank or strips and press firmly into adhesives. Installers should never lay more adhesive than they can cover in approximately 1 hour. Planks or strips should never be slide through adhesive and the use of a Uniclic Tapping Block if it is necessary to fit planks snug together at side and butt ends. Reminder to clean any adhesive off the surface prior to it curing with a clean terry cloth towels and mineral spirits.

- Installers should never work on top of the flooring during installation but if they must work on top then they can use a kneeling board.
- Once the remainder of the floor has been installed, installers should go back to the starter wall and remove the straight edges and spread adhesive on the remainder of the open subfloor.
- Reminder that the planks closest to the wall may have to be scribed and cut to fit due to any irregularities along the wall.
- 24 hours after installation have been completed, the low adhesion delicate surface painters tape can be removed, and any residue left by the tape needs to be cleaned off using mineral spirits on a clean white terry towel.

Staple/Nail Down Installation Method

- If the engineered flooring is 5/16" thick than it is not approved for staple or nail down installation and is recommended for direct glue down installation only.
- Engineered hardwood that is multi-ply tongue and groove except for Luan, Parquet or Masonite may be installed over wood subfloors with the use of staples or cleats with the proper type of flooring stapler made or properly adjusted to the thickness of the engineered wood.
- A 15lb felt or rosin paper, in addition to the ground cover in the crawlspace, should be installed over the subfloor to reduce squeaks and noises created by the opposing floors prior to the installation of the new engineered wood.
- Installers should measure from the ends of the starting wall the width of the plank with an additional 3/8" for expansion and mark both ends with a chalk line so that where possible to lay the flooring at 90° angles to the floor joists.
- Expansion space is required along the perimeter of the room or rooms and is dictated by the thickness of the flooring.
- The groove side of the planks should be facing the wall and along the chalk line and then use brads or small finishing nails to secure the starter row along the wall edge 1" to 2" from the ends and every 4" to 6" along the side.
- Counter sink the nails and fill with the wood filler that blends with the flooring as well as place nails in a dark grain spot in the board. The installed shoe molding will cover the nails after the installation has been completed.
- Installers should blind nail at a 45° angle through the tongues which will be easier if holes have been pre-drilled in the tongues and should be nailed 1" to 2" from the ends and every 4" to 6" along the side. It will be necessary for the installer to blind nail the next 2 rows.
- An installer can use a brad nailer with 1" to 1-3/8" brads to blind nail and no pre-drilling will be necessary.
- Installer can continue the installation with an engineered wood flooring stapler with the recommended staples by stapling the flooring 1" to 2" from ends and every 4" to 6" along the edge tongues.
- See the floating installation method section for end joint spacing and starting additional rows.
- Floor fasteners can be used on engineered hardwood and installers should follow these guidelines for the gauge sizes. A 20-gauge fastener should be used on a 1" long, 3/8"

- thick multi-layered core and the 18-gauge 1 ¼” fastener should be used on a ½” thick multi-layered core.
- It is recommended to initially set the compressor at 80 to 85 PSI and adjust the pressure to ensure that the fasteners are properly set and to keep the staples from going through or breaking the tongues.
- The installer may need to make necessary adjustments to provide adequate penetration of the staple or nail into the nail bed as staples should be flush in the nail pocket and not beyond as improper stapling techniques can cause squeaks in the floor.

Floating Installation Method

- Door casings should be undercut 1/16” higher than the thickness of the flooring being installed and this can be achieved by taking a scrap piece of flooring to use as a guide, laying it on the substrate and then cut the casing with a handsaw or a power jamb saw that has been set at the proper height.
- All moldings and wallbase should be removed prior to installation.
- The underlayment requirements are extremely important to a floating installation.
- The underlayment should be laid with the moisture barrier facing up and should be parallel to the direction of the flooring being installed.
- The underlayment should be placed with approximately 1” overlapping onto all perpendicular walls for the first row of flooring and then place the following row next to the first row on top of the lower moisture barrier overlap.
- Fold back the upper overlap on the second row and remove the adhesion strip while making sure the underlayment fits together tightly without any gaps.
- For the final row, place the underlayment 1” up the wall and should you need to join rolls on the short side of the underlayment, a moisture resistant tape is recommended to connect the 2 pieces, so water cannot penetrate the underlayment.
- Excessive pad compression or compaction can cause seam failure which is a common cause.
- The expansion space for the floating method should be maintained at least 3/8” around the perimeter of the room, all pipes, counters, cabinets, fireplace hearths, doorframes and any other fixed vertical objects in the room.
- Any rooms that are larger than 26x33 as well as doorways or archways 48” or less are required to have a t-molding installed.
- The floating method requires that the engineered hardwood planks be glued together with glue being placed along the topside of the groove and bottom side of the tongue for the full length of the side and end.
- Only a 3/32” bead of glue should be applied, and should the groove become filled with glue than it will be difficult to close the seam which does not allow for a tight fit.

First Row

- The first row should start in the right-hand corner of the room with the spacing around the wall perimeter of 3/8” being maintained with the use of wood wedges.
- The groove side of the planks should be facing the wall and full-length boards should be used in the first row and it is required to work from right to left.

- The end tongue of the plank should be slid into the end groove of the previously installed plank and then make sure that each plank is placed firmly against the wood wedges.
- Make sure that after setting the first row that it is against a firm starting point and then lay out three to four rows prior to starting the installation.
- Follow this manner of laying the planks until the first row has been completed and make sure to cut the last plank accordingly.
- Verify that the first row is straight by using the wedges to maintain the proper 3/8" expansion space from the wall and the planks may require scribing and cutting to fit any wall curvatures that are present.

Second Row

- Left over planks from the first row should be considered as the starter piece of the second row to help in minimizing waste.
- Installers should layout the flooring to check that the end seams are not too close and that the end joints on the adjoining rows are offset by no less than 6".
- The installation method for the second row is to align this first plank and lock the side into place against the first plank in the first row, then the next plank is aligned with the end joint first into the previous plank in the second row, the side of the plank is then tapped lightly against the previously laid row and this should be continued all the way across the entire row.
- The fitting wedge can be removed, and the installer should press in the row of planks with a light pressure on the long side with the possibility of a tapping block being required to ensure a tight fit of all the long-side joints.
- The remaining planks can now be laid row after row in this manner.

Third Row and Remaining Rows

- To avoid any undesirable joint patterns showing you can move rows.
- The remaining row's end joints should be random throughout the floor with the first three rows ensuring a staggered pattern that offsets the previous row with end joints that are no closer than 6" from one another.
- The planks should be placed in a non-random pyramid or stair step pattern to ensure that the planks remain engaged through the force of the tapping.
- Installers should stretch and stick low adhesion delicate surface painters tape approximately 2" apart from each other across every 3 to 5 rows to hold the floor in place until the glue sets and then the tape can be removed within 24 hours.
- After finishing the installation of 8 or 10 rows, the installer should stand back and check for crowning or heaving due to tension strapping or any damage caused by improper taping.

Cleaning and Installer Responsibility

- Installers should clean as they install, and should any glue squeeze out of the seam between the planks then they should allow it to dry for 10 to 15 minutes and then using a plastic scraper or putty knife, lightly scrape it away and any remaining glue can be cleaned with a damp cloth.

- Glue should never be left to dry on the surface of the flooring as it will prove to be very difficult to clean off.
- Xulon's warranty for separation of planks and damage caused by using the incorrect tape or the length of time the tape was allowed to remain on the floor is the sole responsibility of the installer.

Moldings and Transitions

- Transition moldings should be installed directly to the subfloor.
- For transitions on wood subfloors, pre-drill and hand nail transitions to the wood subfloor using 6d finishing nails, pneumatic finish nailers or pneumatic brad nailers.
- For transitions on concrete subfloors, use a wood urethane tube adhesive to bond the wood transition to the concrete.
- Cut the moldings with an electric miter saw that uses a 60 tooth or 80 tooth fine finish carbide tipped blade which can hide the cuts better when joining moldings.
- The quarter round moldings should be attached to the wall and never to the flooring itself.
- Base boards are used for hiding any imperfections and adds a custom finish along the wall.
- Quarter round is used to cover the expansion space left at walls and other fixed surfaces.
- Reducers are a transition that is used to lower floors.
- Stair noses are installed to finish the look of any exposed edges of stairs and landings.
- T-moldings join two areas of flooring of similar height.
- End caps finish the expansion space at sliding glass doors, bath tubs or transitioning to carpet.
- Use a wood filler that blends with the installed engineered flooring to in any gaps along the joints or areas where brad nails were used in the trim or the flooring.

Preventative Maintenance

- The use of mats at entrances is recommended to collect dirt, grit and wet shoes.
- Breathable rugs and rugs pads are safe for hardwood floors should only be used but owners should verify with the rug manufacturer and rugs with PVC, petroleum or solvent based backings should be avoided.
- Floor protectors and wide-load bearing leg bases are encouraged for heavy objects such as fish tanks, pool tables and pianos.
- Soft rubber castors or felt casters should be installed on office chairs and felt pads used under chair legs.
- Owners should avoid walking on their floors with stiletto heels, sports cleats or exposed metal parts.
- Pets nails should be kept trimmed and neat to prevent any scratching to the floor.
- Never slide or roll heavy objects across the floor such as heavy furniture or appliances.
- Owners should avoid any exposure to excess water during periods of inclement weather.

- UV sunlight will either lighten or darken tones of different species of hardwood to varying degrees, so it is recommended that occasionally the owner should rearrange the area rugs and furniture to allow the floor to antique or age evenly.
- We do not recommend the use of hot steam cleaning machines on hard wood products and will not take responsibility should the owner use this machine on their floors.
- Toys and tools can scratch and dent the finishes which are site related and not warrantable by our company.

Hardwoods Reaction to Sunlight

Hardwoods contain certain types of acids in their cellular structure that with the exposure to sunlight begin to amber and this color change is known as patina. The wood reaches its own natural warmth and patina level and will stop ambering but the amount of patina is directly related to the species, amount of acids and the level of sunlight. The entire floor will reach the same patina over time, but owners will often notice that after a rug has been removed that the floor is noticeably different in the color underneath. Once the rug has been removed and the entire floor has been exposed to the same amount of light then it will even out over time and become uniform in color.