



Xulon Prefinished Solid Hardwood

Installation Guide

Pre-finished Solid Hardwood

Installer/Owner Responsibility

- Wood flooring is a natural product that is characterized by the natural variations in grain, pattern and color which are neither flaws or defects but the expression of natural beauty and uniqueness of wood and should be expected. The pre-stained flooring will be the only kind of wood that will have the most uniformity in color or shade.
- Xulon's Solid Hardwood 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.
- An additional 5%-8% should be included with the actual order of the hardwood as the percentage is dependent on layout, board selection and species. While custom installation jobs, diagonal layouts and certain species may need any additional 10% to 15% of material ordered.
- Prior to installation, it must be determined by the installer and owner that the job site and subfloor conditions have met or exceed all requirements that have been outlined and that the in-home environment, weather fluctuations and product storage can negatively affect all organic materials. Xulon denies all responsibility for installation or product performance failure due to issues with the subfloor, substrate, environmental deficiencies or jobsite conditions.
- Prior to the installation of solid hardwood, Xulon requires that the product acclimates for a minimum of 72 hours which allows the flooring to achieve equilibrium moisture content (EMC) with the installation environment. For products that are 5" wide or wider may require additional time which is determined by moisture content. For tropical species, this is especially important as the denser woods experience more significant shrinkage in low moisture/humidity environments.
- 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.
- 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. To help reduce any gapping, boards of similar widths should be placed together in the same row.
- Xulon declines any responsibility for product or installation failure that has been caused by subfloor, jobsite, substrate or environmental deficiencies.
- Xulon's 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, powder rooms or over radiant heat.
- 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.

- **Caution:** Wood Dust Cutting, sanding or machining wood products produces wood dust. While wood products are not hazardous under the OSHA Hazard Communication Standard (29 CFR 1910.1200), the International Agency for Research on Cancer (IARC) and the State of California have classified wood dust as a human carcinogen.
- **PROPOSITION 65 WARNING:** This product produces wood dust when cut, sanded or machined. Wood dust is considered a carcinogen by the State of California.
- **Precautionary Measures:** Airborne wood dust can cause respiratory, skin and eye irritation. Power tools should be equipped with a dust collector. Use an appropriate NIOSH-designated dust mask. Avoid dust contact with skin and eyes.
- **First Aid Measures in case of irritation:** In case of irritation flush eyes with water. If needed seek medical attention. If dermatitis occurs, seek medical attention.

Tools: Basic Tools and Accessories:

- 10D Nails Mechanical Fastener
- 15# Felt Paper or Rosin Paper
- Miter Saw
- Broom
- Moisture Meter
- Chalk Line & String
- Pencil
- Cleats or Staples (see schedule)
- Pry Bar or trim puller
- Coordinating stain, filler/putty
- Straight Edge
- Coordinating trims or moldings
- Table Saw
- Drill and drill bits
- Tape Measure
- Hand or Electric Jam Saw
- Utility Knife

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 with temperatures running between 60-80°F with the humidity between 30% and 50% for at minimum of 5 days prior to the hardwood delivery.
- **Caution:** In certain regions of the country, the temperature and humidity are moderate so homes in these areas might not have the typical HVAC systems for the regulation of the indoor environment so in that case, it will be the responsibility of the installer and homeowner to determine if the indoor environment or moisture content of the wood flooring is suitable or not for the installation to take place and its on-going maintenance.

Subfloor Preparation

Xulon Solid hardwood floors can be installed over any subfloor that is flat, clean, dry and structurally sound for on or above 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. Xulon's 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.
- All subfloors must be flat and smooth within 1/4" in a 10" radius.
- The subfloor should always be tested with the appropriate moisture meter and the installation cannot continue if the subfloor moisture level does not exceed 12% and the moisture level between the subfloor and the flooring are more than 4% in difference.
- For solid hardwood that are 3" or wider planks, there should not be a difference of more than 2% between the subfloor and the flooring.
- Installers should avoid subfloors with excessive vertical movement or deflection as this will telegraph through to the finished installation and some of these indications are uneven finish wear, fastener release, squeaking, compromised or damaged locking systems, sectional contours such as bowing or dipping in floors and uneven flooring material.
- The subfloor panels should be nailed or screwed to secure boards with excessive vertical moment or deflection and the warranty does not cover any problems that have been caused by inadequate substructures or improper installation of said substructures.
- 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.
- Never install solid hardwood over particleboard, fiberboard or pressed wood panel.
- All water-damaged, swollen or delaminated subflooring must be immediately replaced while checking the floor for any squeaks/loose components or repair areas by adding fasteners or adhesive.
- Never glue Solid Hardwood directly to any subfloor surface.

- Xulon Solid Hardwood Flooring is recommended for 3 types of subfloors which are plywood/OSB, solid wood planks (1x6 or larger) or sleepers (2x4”).
- Xulon Solid Hardwood is not recommended for below grade installations or over radiant heat.

Substrates

Wood

- Joist spacing 16” (oc) on center or less Plywood: Minimum of (5/8”, 19/32”) 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”) or two layers of subflooring, or brace between truss/joists in accordance with local building codes. Wood floor orientation
- 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.
- 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 1/2” thick.
- 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 1/2” approved underlayment floor panel.
- Pressure treated plywood is not for interior use as it may have elevated moisture or latent with rot resistant chemicals.
- Particleboard, Luna or Masonite is not recommended for nailing solid wood and should be replaced with minimum recommended subfloor material to meet the minimum thickness requirements or to cover with 3/8” plywood underlayment.

- 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.
- Do not install directly over floor joist with subflooring as the subfloors provide strength and a proper nailing base.
- Solid board planks used for subflooring should be ¾" x 5 1/2" (1" x 6" nominal), Group 1 dense softwoods, No. 2 Common
- Floor joist (16" to 19.2 oc) The total subfloor thickness minimum must be 1-1/4" Floor joist (19.2 to 24" oc) The total subfloor thickness minimum must be 1-7/16". When nailing over existing solid wood tongue and groove flooring, install over an additional 3/8" plywood or run the new floor perpendicular or at a 45-degree angle to the direction of the existing flooring.
- All subfloors must be flat to within 3/16" in 10 feet or 1/8" in 6 feet radius and all wood subfloors must be securely nailed or screwed to joists to minimize movement or squeaks.
- Installers should install over 16" minimum center-to-center joist sub-structure and thoroughly inspect and replace existing floor or subfloor that shows any evidence of water damage or structural weakness.
- Any squeaky or loose boards must be re-secured while any sagging or loose sections of a wood subfloor must be repaired.
- If the subfloor seems uneven or is cupping than that can be an indication of excess moisture or rot and needs to be identified and repaired immediately.
- High spots/joists can be sanded down while low spots should be cut out and repaired or can be filled with old pieces of firm vinyl or build up with 30 lb. black roofing paper.
- Never fill in low areas under nail down flooring with a cement patching material as that can break down over time.
- Any new construction properties, it is the responsibility of the builder or general contractor to provide the wood flooring installer with a subfloor that is within the tolerances listed above and if it is not then the installation must be postponed till the necessary corrections have been made.
- **CAUTION:** Do not sand any surfaces containing lead based paints, finishes, or asbestos. For buildings built in 1978 and earlier, contact the EPA for lead based testing prior to any sanding (www.epa.gov).

Wood Subfloor over Concrete

- A floating subfloor over concrete that is not attached to the subfloor.
- The concrete should be flat to within 1/8" over 6" or 3/16" over 10".
- Installers should install a 6mil poly sheeting to completely cover the concrete overlap seams 6" and duct tape.
- A minimum of two layer of 1/2" CD Exposure 1 Plywood subfloor panels (CDX) 4x8 sheets and square edged plywood panels should be placed 1/8" gaps between sheets and a 3/4" minimum expansion space at all vertical obstructions and wall lines.
- Place the first plywood layer with edges parallel to the wall without fastening and leaving that 3/4" expansion space and then lay the second layer at a perpendicular or 45-degree angle to the first layer.

- The second layer needs to be screwed and glued to the first layer on 12" interior grid pattern and installers should be careful to not penetrate the vapor retarder. Installers should use fasteners long enough to secure the flooring to the subfloor and avoid penetrate the vapor retarder.

Nail-Down Subfloor over Concrete

- This system is attached to the concrete subfloor and uses a minimum 3/4" CD Exposure 1 Plywood subfloor panels (CDX), 4x8 sheets.
- The concrete should be flat to within 1/8" over 6" or 3/16" over 10" with a compressive strength that must equal 3000 psi or better.
- Installers should install a 6mil poly sheeting to completely cover the concrete overlap seams 6" and duct tape.
- Fasteners may be powder-driven pins, pneumatic driven nails, or other fasteners suitable for concrete application. Check with fastener manufacturer for specification such as length, drill size, and/or shot load where applicable.
- Panel joints should be staggered to allow for approximately 1/8" expansion space around all panels as to prevent edge peaking due to compression that is caused by panel swell.
- For vertical obstructions, there should be a 3/4" minimum expansion space allowed, and the panels should be mechanically fastened but for powder load or pneumatic pressure information than the installer should contact the manufacturer.
- The nailing requirements have a minimum of 32 shots per 4x8 panel.
- Any areas with higher humidity could require additional fasteners and the installer should use 1-1/2" long fasteners when nailing a 3/4" flooring to this subfloor.

Glue Down Subfloor over Concrete

- This system is attached to the concrete subfloor and installers must follow the adhesive manufacturers recommendations as far as the type of adhesive, floor prep, moisture barrier and trowel size.
- The concrete should be flat to within 1/8" over 6" or 3/16" over 10" with a compressive strength that must equal 3000 psi or better.
- It uses a minimum 3/4" CD Exposure 1 Plywood subfloor panels (CDX), 4x8 sheets that cuts the 4x8 sheets into 4-12x8 planks and then installers place 12x8 planks into wet adhesive and stager the joints a minimum of 12" to allow the planks to fully bond/cure prior to the wood installation.

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

Installers start by using random length planks from the carton or by cutting four to five planks into random lengths that have a difference of at least 6". They should continue to work across the floor while maintaining the 6" minimum stagger between end joints on all adjacent rows. The left-over pieces can be used to start the next row or to complete a row and this is called racking the floor. The installer should make sure to blend the wood from several cartons to ensure that a good mixture of grain and shading is visible throughout the installation.

- The layout is done by measuring and marking 3" from the wall at two spots that are near each end of the room and then drive a nail at each spot where the installer will stretch a string and tie each end of the string around the nails, so the nails become posts and the installer can use the string as the flooring guide.
- The string should be used as a straight edge to lay the first row of flooring in place with the tongue facing the center of the room while leaving a 3/4" gap at the wall, pre-drill and face nail using the 10D nails which installers should use to continue nailing the entire length of the room.
- An expansion gap of 3/4" should be left at each end where the nails should be set and then the holes filled with a matching putty and then remove string and nails.

- Installers should continue the laying process using a mechanical fastener until the installation is complete while carefully cutting the last row to leave a 3/4" expansion space and then replace/install trim moldings.

Staple/Nail Down Installation Method

- Solid hardwood that is 3/4" can be installed over wood subfloors using staples or flooring cleats and then installing 3/4" solid wood planks or strips, installers should use nails or staples with the proper type of flooring stapler or nailer that is made for the thickness of the hardwood flooring.
 1. Installers must nail or staple 1" to 2" from the ends and then every 4" to 6" along the edges to insure a satisfactory installation with the recommendation to set the compressor PSI at 80 to 85lbs to start and then to adjust as necessary to keep the staples from going through or breaking the tongues on the planks.
 2. Improper stapling techniques can cause squeaks in the floors, so an adjustment may be necessary to provide adequate penetration of the nail or staple into the nail bed.
 3. The use of scrape material to set the tools properly is encouraged and staples are not recommended for solid hardwood floors that are 3" and wider.
 4. The expansion space of 3/4" is required along the perimeter wall and at all vertical structures.
 5. The planks should be placed with the tongue facing away from the wall and along the chalk line.
 6. The installer should use 10D nails to secure the starter row along the wall, counter sink the nails and fill with the appropriate filler that blends with the flooring.
 7. Nails should be placed in the dark grain spots on in the board whenever possible and the quarter round will cover the nails once these have been installed after the flooring installation is complete.
 8. 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.
 9. An installer can use a brad nailer with 1" to 1-3/8" brads to blind nail and no pre-drilling will be necessary.

3/4" Solid Hardwood over Concrete

An installer can install solid hardwood flooring on concrete slabs as long as they are on or above grade and have a minimum 3,000 psi. The concrete slab should be tested for moisture with a Calcium Chloride Test and emit less than 3 pounds per 1000 square feet per 24 hours to which the appropriate nailing subfloor can be installed. Installers should record the moisture test results and leave them with the owner for them to keep in their records.

There are several ways to install 3/4" solid hardwood over concrete which are listed below:

1. 3/4" or thicker Exterior Grade Plywood laid over a vapor retarder of 6 mil poly or two layers of 15# felt and power nailed into the concrete slab. The ends of the plywood panels should be staggered 1/2 panel in alternating rows and an expansion space of 1/2" should be left around the perimeter of the room. An expansion gap of 1/8" must be

left between the panels. The flooring may then be nailed to the plywood surface using 1-1/2" fasteners.

2. 3/4" or thicker Exterior Grade Plywood may also be glued to the vapor retarder that has been glued to the concrete floor. The vapor retarder and plywood should be glued using cutback adhesive or another approved adhesive that has been applied according to the manufacturer's directions. The plywood panels should then be cut down to 4X4 or 16X8 and the panel joints should be staggered by 2". Score the backs of the panels 3/8" deep on a 12" grid, laying the scored side into the adhesive observing a 1/8" gap between the panels and a 1/2" space around the perimeter.
3. As an alternative a floating plywood base can be installed. In this method a 6mil poly vapor retarder is laid on the floor lapping the seams at least 6". Installer can then out loose lay 3/8" exterior grade plywood panels on the floor which allows 1/8" between panels and 1/2" between the panels and walls or other vertical surfaces and offsetting the ends by 1/2" panel. They should next lay a second layer of plywood at 90° angles to the first layer allowing 1/8" between the panels and 1/2" between the panels and walls or other vertical surfaces and offsetting the ends 1/2" panel. Staple the panels together with staples that have crowns at least 1/4" and that do not penetrate the bottom layer in a pattern not exceeding 6X 6. Lay an additional vapor retardant barrier over the plywood panels and begin installation of the flooring.
4. Flat, dry Screeds or 2X4 boards of Group 1 softwood in random lengths from 18" to 48" may be used as a nailing base. The boards must be preservative treated (suitable for interior use) and dried to no more than 12% moisture. The screeds should be adhered to the floor using suitable mastic adhesive at 12" on center. A 6mil poly vapor retarder is draped over the screeds and the flooring is nailed directly to the screeds, provided the flooring is less than 4" wide. For flooring 4" wide and over a wood subfloor must be applied over the screeds to provide adequate nailing surface such as 5/8" CDX plywood or 3/4" OSB are recommended for this application. In high moisture conditions such as coastal areas an additional vapor retarder should be glued directly to the slab before the screeds are installed in addition to the vapor retarder over the screed.

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 solid hardwood flooring to in any gaps along the joints or areas where brad nails were used in the trim or the flooring.

Helpful Hints

1. Never install 3/4" Solid Hardwood Flooring below grade level, it should only be used on or above ground level.
2. Installers should check that their mechanical fastener is approved for use in OSB if plywood is not used as a substrate.
3. Installers should lay out several cartons to check quality and grading while they "rack" or stagger the end joints in random lengths. They should never install from multiple pallets without checking them for color compatibility.
4. There should be a 3/4" expansion space left at all perimeter walls and vertical structures.
5. Installers cannot use the mechanical fastener on the first and last few rows, they should pre-drill and then nail with 10D nails, countersink nails and then use matching putty to fill in the nail holes.
6. Any rows that must be hand nails can be pre-drilled at an angle through the top of the tongue to hide nail heads.
7. The flooring should be laid perpendicular to the direction of the floor joists.
8. If a plank is slightly bowed, then the installer should nail one end first and then use a pry bar to push the other end in place.
9. Shorter planks can be used with undercut door jams as it will help when fitting the flooring in place.

Preventative Maintenance

- The use of mats made with natural fibers at entrances is recommended to collect dirt, sand, grit and other substances such as oil, asphalt or driveway sealer that could be tracked onto the floor.
- 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.
- To avoid slippage, the use of an under-rug underlayment specifically approved for urethane finished is recommended.
- Floor protectors and wide-load bearing leg bases are encouraged for heavy objects such as fish tanks, pool tables and pianos and the rule is the heavier the object, the wider the floor protector.
- 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.
- Sharp, pointed or rough textured objects should NOT be exposed to the hardwood flooring.
- 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, instead the use of a dolly is recommended.
- A normal indoor relative humidity level should be maintained throughout the year to minimize the natural expansion and contraction of the wood and should be between 30%-50%.
- 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.
- Xulon does 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 Xulon.

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.