

3/4” Solid Hardwood Flooring Installation Instructions

Solid Hardwood Flooring can be installed over most properly prepared subfloors, making them suitable for installation on or above grade levels where moisture conditions do not exist. We continuously make technological advancements that improve product performance or installation techniques and methods. To confirm you have the most recent installation instructions, please visit our website www.mohawkflooring.com or contact Technical Services at 888-387-9881, Option 3

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.

To request a Material Safety Data Sheet (MSDS), call 888.387.9881, Option 3.

WARNING! DO NOT MECHANICALLY CHIP OR PULVERIZE EXISTING RESILIENT FLOORING, BACKING, LINING FELT, ASPHALTIC “CUTBACK” ADHESIVES OR OTHER ADHESIVES.

Previously installed resilient floor covering products and the asphaltic or cutback adhesives used to install them may contain either **asbestos fibers and/or crystalline silica**. **The products in this carton do not contain asbestos.** Avoid creating dust. Inhalation of such dust is a cancer and respiratory tract hazard. Smoking by individuals exposed to asbestos fibers greatly increases the risk of serious bodily harm. Unless positively certain that the product is a non-asbestos containing material, you must presume it contains asbestos. Regulations may require the material be tested to determine asbestos content and may govern the removal and disposal of material. See current edition of the Resilient Floor Covering Institute (RFCI) publication “Recommended Work Practices for Removal of Resilient Floor Coverings” for detailed information and instructions on removing all resilient covering structures.

INSTALLER / OWNER RESPONSIBILITY:

It is the responsibility of the installer and owner to ensure that job site environmental, sub-floor and subsurface conditions involved meet or exceed all requirements as outlined in installation instructions prior to installation. Manufacturer declines all responsibility for product performance or installation failure due to sub-floor, substrate or environmental deficiencies or jobsite conditions.

Manufacturer requires Solid Hardwood products acclimate for a minimum 72 hours prior to installation. Additional time may be required for 5” wide or wider products as determined by moisture content. Acclimation allows flooring to achieve equilibrium moisture content (EMC) with the installation environment. All wood continually expands and contracts until it reaches moisture equilibrium with the environment in which it’s installed. As with all wood flooring, expansion and contraction will be minimized if climate control is consistently maintained year round. **This is especially important with tropical species, because denser woods experience more significant shrinkage in low moisture / low humidity environments.**

All work involving water or moisture (plumbing, masonry, painting, plastering) must be completed prior to flooring being delivered. Building envelope must be complete and exterior doors and windows installed. Exterior grading and gutter downspouts should be completed and permanent HVAC systems in operation for 14 days prior to flooring being delivered to job site. Measures should be taken to protect floors from other trade work.

Do not cover floors with plastic, red rosin, felt or wax paper or previously used cardboard. Instead use a breathable material such as clean, dry, plain uncoated cardboard or Kraft paper. Inks from printed cardboard could damage the hardwood floor. The floor should be thoroughly cleaned before covering to remove grit and debris that would damage the finish. The floor must be completely covered to eliminate uneven ambering from exposure to UV light.

Room temperature should be 60 – 80° F, with relative humidity between 35 – 55%. These environmental conditions are specified as pre-installation requirements and must be maintained for the life of the product. The HVAC system should be in operation for a minimum of 14 days prior to installation.

Building interiors are affected by two distinct humidity seasons – Heating and Non- Heating. Care should be taken to maintain humidity levels between 35-55%.

Manufacturer warranties do not cover natural expansion and contraction which results in separation between planks or damage caused by excessively low or high humidity. Seasonal gapping is not considered a manufacturing defect.

Heating season – Low Humidity, Dry. All heating methods create dry, low humidity conditions. Humidifiers are recommended to prevent excessive shrinkage or gapping in wood floors due to seasonal periods of low humidity.

Non Heating Season and Coastal or Waterfront Areas – High Humidity. During the non heating season proper humidity levels should be maintained by using an air conditioner, dehumidifier or by turning on your heating system periodically during the summer months.

Do not install in full bathrooms or powder rooms. Do not install over radiant heat.

Examine flooring for color, finish and quality prior to installation. If material is unacceptable, contact the seller immediately. Wood is a natural product and contains characteristics such as variations in color, tone and graining. Flooring is manufactured in accordance with industry standards, which allows manufacturing and natural defect tolerances **up to 5%** of the total installation. Installer should work from several cartons at the same time to ensure good color and shade blend. Installer should not install undesirable pieces.

Flooring warranties DO NOT cover materials with visible defects once they are installed. Installer and Owner are responsible for final inspection of flooring manufacture, grade and finish. Purchase an additional 5% of flooring to allow for cuts and an additional 10% if installing diagonally.

WARRANTY NOTE: Installer should provide owner with one carton end label from product installed for warranty purposes. Owner should retain carton end label and copy of their original sales invoice with product style name and style number for their records. **Excess flooring should be retained and stored in**

climate controlled area for future repairs in the event planks are ever damaged.

The use of stain, filler or putty for correction is considered a normal practice and a routine part of installation.

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
Mohawk FloorCare Essential Hardwood Floor Cleaner or Columbia Flooring Hardwood	

STORAGE AND HANDLING:

Flooring material should be delivered to the job site and stored in the room(s) where it is to be installed for a minimum of 72 hours before being installed to allow the material to acclimate. Open the cartons but do not remove the product from the cartons. Make sure the room temperature is set at a normal living temperature as described above. The flooring is acclimated and ready for installation when it has reached a moisture level consistent with the job site and normal living conditions.

The subfloor and flooring should be tested with an appropriate moisture meter. The subfloor moisture level must not exceed 12%. The difference between the moisture content of the wood subfloor and the hardwood flooring must not exceed 4%. For hardwood products greater than 3" wide, the moisture content of the wood subfloor and hardwood floor should not differ more than 2%.

PRE-INSTALLATION & JOB SITE CONDITIONS

SUBFLOOR REQUIREMENTS:

The following subfloor recommendations are intended to complement the installation of hardwood flooring as an interior finish. Hardwood flooring is not a structural component. These recommendations are not intended to supersede federal, state or local building codes, but as with many other interior finish products, may require modifying existing structural components for a successful installation.

Building codes establish requirements for structural support components of flooring systems which may not provide adequate rigidity and support for proper installation and performance of a hardwood floor. Whenever possible, install flooring perpendicular to the floor joists for maximum stability.

NOTE: Avoid subfloors with excessive vertical movement or deflection because subfloor movement will telegraph through to the finished installation. Indications of excessive deflection 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. Nail or screw subfloor panels to secure boards with excessive vertical movement or deflection. If the subfloor has excessive vertical movement (deflection) before installation of the flooring, it is likely it will do so after installation of the flooring is complete. Our warranties DO NOT cover any problems caused by inadequate substructures or improper installation of said substructures.

Do not install Solid Hardwood Flooring over particleboard, fiberboard, or pressed wood panel.

Solid Hardwood Flooring is not recommended for below grade installations or over radiant heat.

Do not glue Solid Wood Flooring directly to any subfloor surface.

SUBFLOOR PREPARATION RECOMMENDATIONS FOR ON OR ABOVE GRADE ONLY:

We recommend 3 types of sub-floors: plywood/OSB, solid wood planks (1 x 6 or larger), or sleepers (2 x 4 inch). Each subfloor has separate installation guidelines.

Solid hardwood flooring may be installed on or above grade provided the subfloor is:

- **CLEAN** – all construction debris, soil, mud and any other objects on or adhering to the floor are scraped and swept away before installation.
- **FLAT** – within ¼" in a 10' radius.
- **DRY** – always test the subfloor with the appropriate moisture meter. Installation cannot continue until the sub-floor moisture does not exceed 12% and the subfloor and flooring moisture differ no more than 4%. On 3" or wider, the subfloor and the flooring being installed should not differ more than 2%.
- **Sound** – all damaged or swollen subflooring should be replaced. Check the floor for squeaks / loose components, repair areas by adding fasteners or adhesive.

WOOD SUBFLOOR-

NOTE: As with many other interior finish products, modification of existing structural components may be required for a successful installation.

Wood subfloors should be well nailed or secured with screws. Nails should be ring shank and screws need to be counter sunk. The wood subfloor needs to be structurally sound (meaning subfloors without loose boards, vinyl or tile). If sub-floor panels are a single layer, less than ¾" thick, add another single cross layer for strength and stability (minimum ½" thick). Underlayment floor panels must be installed sealed side down. When used as a subfloor, allow 1/8" (3mm) expansion space between each panel. If spacing is inadequate, cut in with a circular saw. Do not cut in expansion space on tongue and groove panels.

When installing parallel to the floor joists it may be necessary to increase rigidity of the structural subfloor system by installing an additional minimum of 1/2" (13mm) approved underlayment floor panel.

Approved underlayment floor panels should meet or exceed the following:

Plywood: Must be a minimum CDX grade (exposure1) and meet US Voluntary Product Standard PS1 performance standard or Canadian performance standard CAN/CSA 0325-0-92. The preferred thickness is ¾" (19mm) as a subfloor (minimum 5/8" (16 mm) or 1/2" (13mm) as a 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 the underside of panel for codes. When used as a subfloor, 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 subfloor or 1/2" (13mm) as floor panel underlayment.

Wafer board and Chipboard: Conforming to US Voluntary Product Standard PS2 or Canadian performance standard CAN/CSA 0325-0-392. It must be ¾" (19mm) thick when used as a subfloor and 1/2" (12.7mm) thick when used as a floor panel underlayment.

Subfloor Moisture Check:

NOTE: To increase reliability, moisture testing should be performed after the HVAC system has been in operation for a minimum of 14 days. Excess moisture on any flooring substrate if not identified and corrected prior to installation will cause floor covering failure. **Warranties DO NOT cover products installed over improperly prepared subfloors, substrates or environmental related deficiencies.**

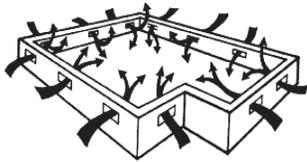
DO NOT INSTALL FLOORING IF MOISTURE TESTS RESULTS EXCEED RECOMMENDED LIMITS.

Wood Subfloor Moisture Content

Test both wood subfloor and wood flooring for moisture content using a reliable pin type moisture meter. The subfloor material must not exceed 12% moisture content. The difference between the moisture content of the wood subfloor and the hardwood flooring must not exceed 4%. For hardwood products greater than 3" wide, the moisture content of the wood subfloor and hardwood floor should not differ more than 2%.

Installer should record moisture test results in the space provided on the page 5 of this document and leave with the owner as part of their records.

NOTE: Basements and crawl spaces must be dry. Use of a 6 mil black polyethylene membrane is required to cover 100% of the crawl space earth and run approximately 6" up the foundation walls. The seams of the 6-mil poly should overlap 4" to 6" and should be taped to the foundation walls using an aggressive tape such as duct tape. This will help retard moisture from below that is emitted from the soil. Crawl space clearance from ground to underside of joist should be no less than 18" and perimeter vent spacing should be equal to 1.5% of the total square footage of the crawl space area to provide cross ventilation.



To correct any subfloor conditions concerning moisture, either wait until the subfloor dries to meet specifications or use an appropriate moisture barrier. For more information concerning moisture conditions, contact Technical Service Department at 888-387-9881 Option 3.

BEFORE YOU START:

- Plan your layout and determine the direction of the installation in the room. Planks installed parallel to windows accent the hardwood best.
- Remove existing base, shoe molding or threshold carefully. They can be used to cover the 3/4" expansion gap left around the perimeter of the room.
- Undercut doors and casings using a handsaw laid flat on a piece of scrap flooring. This will eliminate difficult scribe cuts.
- Sub-floors should be clean prior to the floor installation. Sweep the area to remove all dust and debris.
- Make sure the subfloor is dry to 12% moisture content or less.
- Install 15 lb. felt paper to help reduce squeaks.
- Blend cartons: To achieve a uniform installation appearance, preselect and set aside hardwood planks that blend best with all trims and moldings. Install these planks next to best blended moldings.
- Install planks from several cartons at the same time to ensure good color and shade mixture throughout the installation.
- Be attentive to staggering the ends of the boards at least 4" -6" (10-15 cm) when possible in adjacent rows.

MULTI WIDTH INSTALLATION:

Installing planks of multiple widths requires special consideration when installing. Multi Width products arrive in the same carton, so measure material needs as you normally would.

Always start installation with the widest plank and install in descending widths (example 5", 3", 5" 3").

Do not try to "mix" widths within a row.

INSTALLATION

"Racking the Floor"

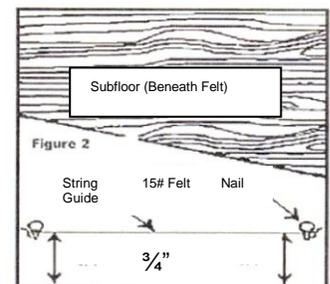
Start by using random length planks from the carton or by cutting four to five planks in random lengths, differing by at least 6". As you continue working across the floor, be sure to maintain the 6" minimum stagger between end joints on all adjacent rows. Never waste material; use the left over pieces from the fill cuts to start the next row or to complete a row.



Note: When installing a pre-finished wood floor be sure to blend the wood from several cartons to ensure a good grain and shading mixture throughout the installation.

Step 1 – LAYOUT

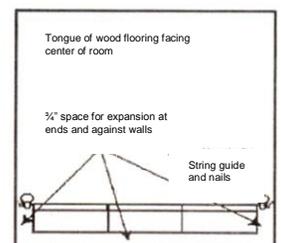
- Measure and mark 3" From the wall at two spots near each end of the room. Drive a nail at each spot. Stretch string and tie each end of the string around the nails so the nails become posts Use the string as your flooring guide.



Note: This dimension should be 4" when installing 3 1/4" wide flooring. When a room is greater than 20 ft. in width, the direction of the installation should start near the center of the room and work out towards the walls placing a loose spline where the two grooves come together.

Step 2 – INSTALL FIRST ROW

- Using the string as a straight edge lay the first row of flooring in place with the tongue facing the center of the room. Leaving a 3/4" gap at the wall, pre-drill and face nail using 10D nails. Continue nailing the entire length of the room.
- Leave a 3/4" expansion gap at each end. Set nails and fill holes with matching putty. Remove string and nails.

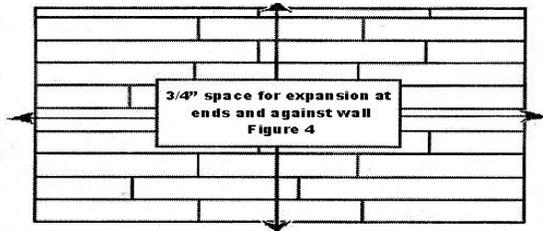


Step 3 – INSTALL REMAINING ROWS

- Continue the laying process using a mechanical fastener until the room is complete (See section – Recommended Pneumatic Floor Stapler or Nailer).

Helpful Hint: Use flooring lengths that offset or stagger the end joints at least 6" or more for a professional look.

- Carefully cut the last row to leave a 3/4" expansion space
- Replace / install trim moldings



STAPLE OR NAIL DOWN INSTALLATIONS:

3/4" Solid Hardwood Flooring may be installed over wood sub-floors using staples or flooring cleats. When installing 3/4" solid wood planks or strips by nailing or stapling it is necessary to use the proper type of flooring stapler or nailer made for the thickness of the hardwood flooring that is being installed.

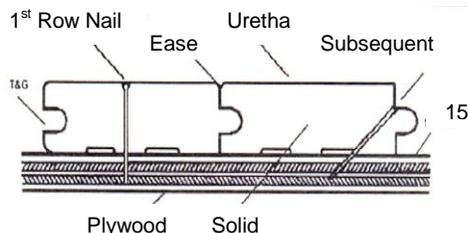
Step 1

You must staple or nail 1" to 2" from the ends and every 4" to 6" along the edges. This will help insure a satisfactory installation. It is recommended to set the compressor PSI at 80 to 85lbs. initially and adjust as necessary to keep the staples from going through or breaking the tongues. Improper stapling techniques can cause squeaks in the floor. Adjustments may be necessary to provide adequate penetration of the nail or staple into the nail bed. You want it flush in the nail pocket. Use a scrap piece of flooring material to set tools properly before installation. Staples are not recommended for Solid Hardwood Floors 3" and wider.

Note: An expansion space of 3/4" is required along the perimeter walls and at all vertical structures to allow the flooring to expand.

Place the planks with the tongue facing away from the wall and along your chalk line. Use 10D 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 appropriate filler that blends with the flooring. Place the nails in a dark grain spot in the board when possible. The base or quarter round will cover the nails when installed after completion of the installation.

Blind nail at a 45° angle through the tongues. It will be easier IF YOU PRE-DRILL THE HOLES IN THE TONGUES. Nail 1" to 2" from the ends and every 4" to 6" along the sides. It will be necessary to blind nail the next 2 rows. A brad nailer with 1" to 1 3/8" brads can also be used to blind nail and no pre-drilling is needed.



INSTALLING 3/4" SOLID HARDWOOD OVER CONCRETE

Solid Hardwood Flooring can be installed on concrete slabs (minim 3,000 psi) that are **on or above grade**. The moisture content of the slab should be tested with a Calcium Chloride Test and emit less than 3 pounds per 1000 square feet per 24 hours, then the appropriate subfloor (nailing surface) can be installed. Installer should record moisture test results in the space provided on the last page of this document and leave with the owner as part of their records.

There are several methods by which this can be accomplished:

- 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.
- 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 other approved adhesive,
- applied according to the manufacturer's directions. The plywood panels should be cut down to 4' X 4' or 16" X 8' 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.
- As an alternative a floating plywood base can be installed. In this method a 6 mil poly vapor retarder is laid on the floor lapping the seams at least 6". Loose lay 3/8" exterior grade plywood panels on the floor, allowing 1/8" between panels and 1/2" between the panels and walls or other vertical surfaces and offsetting the ends by 1/2 panel. 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 6" X 6". Lay an additional vapor retardant barrier over the plywood panels and begin installation of the flooring.
- Flat, dry Screeds or 2" X 4" 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 6 mil 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. 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.

COMPLETING THE JOB – FINISHING TOUCHES

Final Touches:

Install the proper trim molding at the doorways to achieve the transition and along the walls to cover expansion gap and the edges of any gaps along the wall due to irregularity. Complete the job by using wood filler that coordinates with the installed hardwood flooring to fill any gapping along the joints or areas where brad nails were used in the trim or the flooring.

Sweep your floor to remove any particles that could scratch your floor. Use Mohawk FloorCare Essentials to clean the floor.

HELPFUL HINTS

1. Do not install 3/4" Solid Hardwood Flooring below grade level. Use only on or above ground level.
2. Make sure mechanical fastener is approved for use in OSB if plywood is not used as a substrate.
3. Do not install from multiple pallets without checking for color compatibility.
4. Lay out several cartons to check quality and grading and "rack" or stagger the end joints in random lengths.
5. Leave 3/4" at all perimeter walls and vertical structures to allow for expansion.
6. The mechanical fastener cannot be used on the first and last few rows. Pre-drill, nail with 10D nails, countersink nails and use matching putty to fill nail holes.
7. Rows to be hand nailed may be drilled at an angle through the top of the tongue to hide nail heads.
8. Lay flooring perpendicular to the direction of the floor joists.
9. Occasionally, a plank may be slightly bowed. Nail one end first, and then use the pry bar to push the other end in place.
10. Using shorter pieces at undercut door jams will help when fitting flooring in place.

CARE AND MAINTENANCE

- Sweep regularly with a soft bristle broom or dry dust mop.
- Vacuums with a beater bar or power rotary brush head can damage a wood floor and should not be used. Instead use a suction only type vacuum.
- Wipe up spills promptly and use approved hardwood cleaner...
- Use felt protectors under heavy pieces of furniture and chairs.
- Use protective mats at all exterior entrances.
- Spiked heels or shoes in need of repair can severely damage flooring.
- Replace hard plastic, metal casters, or wheels on furniture with soft rubber casters or by using a protective mat under the casters.
- Never wet mop your wood floors. Excess moisture or liquids can cause damage to wood flooring.
- Use only Mohawk FloorCare Essentials Hardwood Cleaner or Columbia Flooring Hardwood Cleaner. **Never** use oil soaps, wax, or other household products to clean your floor.
- Keep pet nails trimmed.
- Protect your floor when using a dolly for moving furniture or appliances.
- Use protective window coverings to protect hardwood floors from excessive heat during periods of direct sunlight.
- Never use rubber backed rugs or pads as they may damage hardwood floors. Area rugs should be soft, non-abrasive, and urethane backed.

Hardwood flooring will scratch and dent

With today's active lifestyles it is important to note that hardwood flooring can, and will, scratch and dent. See Tips & Warnings for protecting your hardwood floor. In order to prevent excessive abuse the use of strategically placed mats and area rugs as well as floor protectors on chair and table legs are a must.

Walk off mats

Exterior and interior walk off mats should be used at all exterior entrances to avoid exposure to moisture from tracking during periods of inclement weather. Walk off mats should be routinely maintained to avoid becoming a soil source. Do not use mats or under mat cushions constructed of rubber or PVC. Instead use urethane backed products.

Hardwoods react to sunlight

Hardwood contains certain types of acids in their cellular structure. With exposure to sunlight these acids begin to amber. The color change is referred to as patina. The wood will reach its own natural warmth and patina level and stop ambering. 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. This is often noticed after a rug is removed and the floor is noticeably different in color underneath. If you remove the rug and expose the entire floor to the same amount of light, it will even out over time and become uniform in color.

WARRANTY

A copy of the Warranty may be obtained by calling the Technical Service Department at 888-387-9881 option 3.

Installer should record moisture readings in the space below and leave with homeowner as part of their records.

Wood Subfloor	
Moisture Content:	_____ % Moisture Content of Subfloor
	_____ % Moisture Content of Hardwood
	_____ % Difference between subfloor & flooring
Concrete Subfloor	
Test Method Used:	_____ Calcium Chloride (ASTM F1869)
	_____ RH (ASTM F2170-02)1869
	_____ Electronic Meter (Tramex or equivalent)
Moisture Readings:	_____

FASTENER SCHEDULE

Hardwood flooring must be installed over a proper-floor. Tongue and Groove flooring **MUST** be blind nailed.

<u>Wood Flooring Type</u>	<u>Size Fastener to be Used</u>	<u>Fastener Spacing</u>
Solid Strip T&G ¾" x less than 3" Wide	1 ½" - 2" fastener, or 6d-8d casing or finish nails. On slab with ¾" underlayment use 1 ½" fastener, ½" crown on staples	Blind fastener spacing along the length of the strips, minimum 2 fasteners per piece near the ends (1"-3"). In addition, every 8"-10" apart for blind nailing, 10"-12" for face nailing.
Solid Strip T&G ¾" x 3" or wider	1 ½" - 2" fastener, or 6d-8d casing or finish nails. On slab with ¾" underlayment, use 1 ½" fastener. Staples are not recommended.	Blind fastener spacing along the length of the strips, minimum 2 fasteners per piece near the ends (1"-3"). In addition, every 6"-8" apart for blind nailing, 10"-12" for face nailing. To assist nailing on planks 5" and wider, options are to screw and plug the plank ends or to apply adhesive.
Solid Strip T&G ½" x 1 ½", ½" x 2"	1 ½" fastener	Blind fastener spacing along the length of the strips, minimum 2 fasteners per piece near the ends (1"-3"). In addition, apply fastener ever 10"
Solid Strip T&G 3/8" x 1 ½", 3/8" x 2"	1 ¼" fastener	Blind fastener spacing along the length of the strips, minimum 2 fasteners per piece near the ends (1"-3"). In addition, apply fastener ever 8"
Solid Strip T&G 5/16"	Narrow crowned (under 3/8") 1"-1 ½" staples or 1" - 1 ¼" flooring cleats.	Space fasteners at 3"-4" intervals for staples, 4"-6" for cleats and within 1"-2" of the end joints.
Subfloor over concrete	Hardened steel pins, 11/4 to 21/8 recommended.	Minimum of 50% of fastener must penetrate concrete. Space fasteners one per square foot or as recommended by fastener manufacturer.

Note: When installing planks 5" wide or wider, additional spacing is required. Use a washer or removable spacer every few rows or omit 15 lb. felt and run a bead of glue in a serpentine pattern along the floor underneath each plank.