ENGINEERED HARDWOOD FLOORING INSTALLATION GUIDELINES - HERRINGBONE

Important Information Before You Begin

It is **EXTREMELY IMPORTANT** that you read and understand this information completely prior to starting, since improper installation can void the warranties.

Installer/Owner Responsibility

Carefully inspect **ALL** material prior to installation for defects. Materials installed with visible defects are not covered under warranty. Remember – Wood is a natural product that can vary in color, grain, and contains natural characteristics that varies from plank to plank and is to be expected. We do not warrant against these natural variations from plank to plank or variations from sample to plank. Remember – If you are not satisfied with the flooring prior to installation, contact your dealer – DO NOT INSTALL the flooring. Accepting or rejecting the material must be done on full shipment of quantities only, not carton by carton or plank by plank. Material is manufactured to exceed industry standards (ANSI/HPVA EF 2009).

- **We urge you, as the final inspector to inspect for proper color, finish, style, and quality PRIOR to installation. Verify that the flooring is the correct material. Care should be taken at this time to remove or repair particular characteristics you do not desire. Manufacturer declines responsibility for any costs incurred when plank(s) with visible defects have been installed.**
- **The use of stain, filler, or putty stick for the correction of minor defects during installation should be accepted as normal procedure.**
- **5% cutting allowance, depending on layout, must be added to the actual square footage amount needed. (Diagonal, herringbone, or bordered installations will require a higher percentage)**
- **Install cabinets prior to flooring to prevent damage to the flooring. Shaw is not responsible for removal of cabinets in the event of a claim**

TOOLS AND EQUIPMENT NEEDED:

Broom or vacuum	**Moisture Meter**	**Safety Glasses**
Tape Measure	**Hand Saw**	**Color Wood Filler**
Chalk Line & Chalk	**Electric Miter Saw/Table Saw**	**Clean Green™ Hardwood Floor Cleaner/ Shaw R2X**
Hammer	**Pry Bar**	**NIOSH designated Dust Mask**

CAUTION: WOOD DUST

The International Agency for Research on Cancer has classified wood dust as a nasal carcinogen. The sawing, sanding, and/ or machining of wood products can produce wood dust that can cause respiratory, eye, and skin irritations. Equipment should be equipped with a dust collector to reduce airborne wood dust. Wear an appropriate NIOSH designated dust mask to reduce exposure to airborne wood dust. Avoid contact with eyes and skin. In case of irritation, flush eyes or skin with water for at least 15 minutes. In cases of severe irritation; seek immediate medical attention. *For further technical or installation questions or to request a Product Specification Data Sheet contact the manufacturer. 1-800-441-7429*

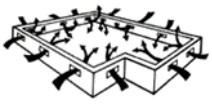
WARNING

Drilling, sawing, sanding or machining wood products can expose you to wood dust a substance known to the State of California to cause cancer. Avoid inhaling wood dust or use a dust mask or other safeguards for personal protection. For more information go to www.P65Warnings.ca.govtwood

PRE INSTALLATION & JOBSITE CONDITIONS

It is the installer/ owners' responsibility to ensure that the jobsite conditions and jobsite subfloor are environmentally and structurally acceptable prior to the installation of any hardwood flooring. The manufacturer declines any responsibility for failures or deficiencies of hardwood flooring resulting from or related to sub-floor, sub-surface, or job-site environmental conditions. All substrates must be clean, flat, dry, and structurally sound.

- Subfloors must be clean and free of dirt, curing compounds, sealers, drywall mud, paint, wax, grease, urethane, or other materials that may affect the integrity of the flooring material or adhesives used to install the flooring.
- All subfloors and subfloor systems must be structurally sound and must be installed following their manufacturer's recommendations. Local building codes may only establish minimum requirements of the flooring system and may not provide adequate rigidity and support for proper installation and performance of a hardwood floor. Whenever possible install the planks perpendicular to the floor joists for maximum stability. Our warranties **DO NOT** cover any problems caused by inadequate substructures or improper installation of said substructures.
- Test wood sub floors and wood flooring for moisture content using a pin-type moisture meter. Take readings of the subfloor – minimum of 20 readings per 1000 sq. ft. and average the results. In most regions, a "dry" subfloor that is ready to work on has a moisture content of 12% or less and the wood should be within 4% of the subfloor moisture content.
- ASTM F-2170 – in-situ relative humidity – 75% RH or less is acceptable. Readings greater than 75% RH require the use of a proper vapor retarder.
- ASTM 1869 - The moisture content for concrete subfloors registered after a calcium chloride test should not be greater than 3 pounds per 1000 square feet of area. If it exceeds these limits, DO NOT install the flooring. **Before moisture testing begins, the slab must be cured for a minimum of 30 days.**



- Basements and crawl spaces must be dry. Use of a 6 mil black polyethylene is required to cover 100% of the crawl space earth. Crawl space clearance from ground to underside of joist to 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. Where necessary, local regulations prevail.
- The subfloor must be flat, meeting a minimum of 3/16" within 10' or 1/8" in 6'.

Concrete subfloors - Use cementitious patching and leveling compounds that meet or exceed Shaw's maximum moisture level and pH requirements. Use of gypsum-based patching and/or leveling compounds which contain Portland or high alumina cement and meet or exceed the compressive strength of 3,000 psi are acceptable. Follow the leveling compound manufacturer's instruction. Leveling compounds must be allowed to thoroughly cure and dry prior to installation of wood flooring.

Wood subfloors - For staple down application use layers of 15lb. felt or wooden shims to fill low spots. Staples must be able to penetrate for holding power.

- All "wet" work – i.e. – paint, drywall, concrete, masonry, plumbing must be complete and dry well in advance of delivery of hardwood flooring

- Gutters and downspouts should be in place and the exterior grade complete to allow for proper drainage of water away from the building's exterior perimeter.
- Flooring should not be exposed to extremes of humidity or moisture.
- Permanent HVAC should be on and operational a minimum of 5 days and maintained between 65 – 75 degrees and a relative humidity of 35%- 55% prior to delivery, during, and after installation of the flooring.
- If HVAC is not possible at time of installation the environmental conditions must be at or near normal living conditions between 60 – 80 degrees and at the average yearly relative humidity for the area.

It is the Installer/Owner responsibility to ensure that the conditions are acceptable prior to the installation of the hardwood floors. The manufacturer declines any and all problems with the hardwood flooring that are related to or attributed to improper jobsite conditions.

Recommended Subfloor Surfaces

Concrete Subfloor Guidelines

Concrete slabs should be of high compressive strength and constructed to prevent groundwater from permeating the concrete. Engineered hardwood flooring can be installed on, above, or below-grade. In addition, it can be installed over above-ground, suspended concrete floors. The suspended concrete must be a minimum of 1 1/2 inches thick and must be structurally sound. The exception to this is lightweight concrete (which usually contains high amounts of gypsum) having a density of 100 pounds or less per cubic foot. Test for lightweight concrete by using a nail to scratch the surface of the concrete. If the concrete crumbles or turns to powder, it is not sound and you should **NOT** install the hardwood flooring. Use the floating installation method (5 ply products 3" or wider) only for lightweight concrete subfloors.

Wood Subfloors Guidelines

Subfloor panels should conform to U.S. Voluntary Product Standard PS1-07, Construction and Industrial Plywood and/or US Voluntary PS 2-04 and/or Canadian performance standard CAN/CSA 0325.0-92 Construction Sheathing. Other CSA standards also apply.

Acceptable Panel Subfloors: Truss/joist spacing will determine the minimum acceptable thickness of the panel subflooring.

- On truss/joist spacing of 16" o/c or less the industry standard for single panel subflooring is minimum 5/8" 19/32", 15.1 mm) CD Exposure 1 subfloor panels, 4x8 sheets.
- On truss/joist spacing of more than 16", up to 19.2" (488mm) o/c, the standard is nominal ¾" (23/32", 18.3 mm) T&G CD Exposure 1 Plywood subfloor panels, (Exposure 1) or nominal ¾" 23/32", (18.3mm) OSB Exposure 1 subfloor panels, 4'x8' sheets, glued and mechanically fastened.
- Truss/joist systems spaced over more than 19.2" (488mm) o/c up to a maximum of 24" (610mm) require minimum 7/8" T&G CD Exposure 1 Plywood subfloor panels, (Exposure 1), or minimum 7/8" OSB Exposure 1 subfloor panels, 4'x8' sheets glued and mechanically fastened – or two layers of subflooring or brace between the truss/joist in accordance with the truss/joist manufacturer's recommendations and with local building codes. Some truss/joist systems cannot be cross-braced and still maintain stability.
- For existing wood floors install new flooring at right angles to the existing flooring.
- Do not glue down hardwood flooring over particle board.
- Do not install over existing glue down hardwood floors.

WARNING! DO NOT SAND, DRY SWEEP, DRY SCRAPE, DRILL, SAW, BEADBLAST OR MECHANICALLY CHIP OR PULVERIZE EXISTING RESILIENT FLOORING, BACKING, LINING FELT, ASPHALTIC "CUTBACK" ADHESIVES OR OTHER ADHESIVES.

These products may contain either asbestos fibers and/or crystalline silica. 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 nonasbestos-containing material, you must presume it contains asbestos. Regulations may require that 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. For current information go to www.rfci.com

Ceramic tile and terrazzo: All wax and sealers must be removed with an appropriate cleaner/stripper. Ceramic tile and terrazzo should be abraded to allow for proper adhesion. Check for loose tiles by tapping and re-adhere. Fill grout lines with a cementitious latex fortified leveling compound.
Resilient tile, resilient sheet vinyl: Material must be full spread and secured to the subfloor. Do not install over perimeter glued floors. Do not install over more than one layer that exceeds 1/8" in thickness.
Nail/ Staple Down Only - If old flooring is unsuitable to install new flooring then overlay with new underlayment. Test to conclude that the staples/ cleats are able to properly penetrate and secure the flooring to the subfloor.
Glue Down Only – Do not install over more than one layer that exceeds 1/8" in thickness. Clean flooring with an appropriate cleaner and allow to thoroughly dry. If necessary degloss the floor using an abrasive pad to enhance the bonding of the adhesive, if wax or other coatings are present, completely remove the material with a quality stripper, rinse the floor and allow to dry. Always check for proper adhesion bond prior to installing.
CAUTION: DO NOT SAND any existing resilient tile, sheet vinyl flooring, or flooring felt as they may contain asbestos fibers that are not readily identifiable. Inhalation of asbestos dust can cause serious bodily harm. Check local, state, and federal laws for handling hazardous material before attempting the removal of these floors.
Acoustic Cork Underlayment: (Glue Down Only) – Install the cork underlayment according to the manufacturer's instructions. The cork underlayment must be fully adhered to the subfloor. The cork underlayment should be of pure granulated cork combined with a polyurethane binder with a minimum density of 11.4 lbs. per cubic foot and not to exceed 13 lbs. per cubic foot.

Pre installation/ Job Preparation

Inspect the Flooring – Inspect material for color, finish, milling, and grade. Hold out pieces that may not be acceptable once installed. **PLEASE NOTE: We do not accept responsibility for any costs incurred when plank(s) with visible defects have been permanently installed.**
Undercut Door Casings - Undercut all door casings 1/16" higher than the thickness of the flooring being installed. To do this, use a scrap piece of flooring as a guide. Lay it on the substrate and cut the casing with a handsaw or use a power jamb saw set at the correct height.
Blending of Cartons- To achieve a uniform appearance across the entire floor, we highly recommend that you open and work from several cartons at a time and dry-lay the flooring, mixing the planks from several cartons. This will allow you to blend the planks for maximum aesthetic appearance. Make certain the room is well lit to ensure color is consistent and that any visual defects can be seen and removed.
Match Transition Moldings: For best appearance, blend all transitions and moldings to planks that have similar color and graining. Set them aside for use as needed.
Expansion space: Expansion space around the perimeter is required and should be equal to the thickness of the flooring material. For commercial installations use a minimum of ½" expansion.

GLUE DOWN INSTALLATION GUIDELINES

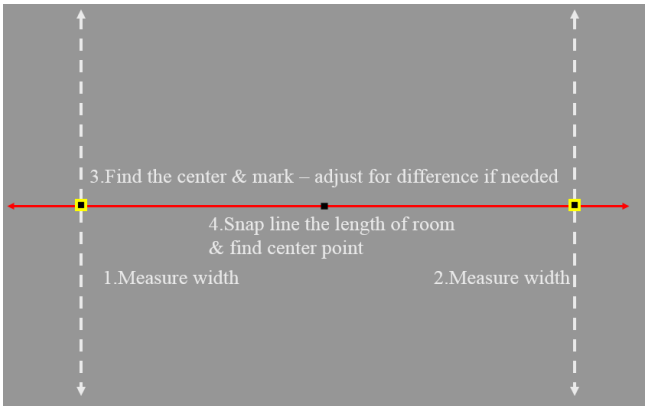
Additional tools & material needed:	**Hardwood Adhesive**
Clean White Rags	**Rubbing Alcohol / Urethane Adhesive Remover**
Adhesive Trowel	**Straight Edge**

NOTE: REFER TO THE ADHESIVE LABEL FOR PROPER TROWEL REQUIRED, SPREAD RATES AND INSTALLATION APPLICATION INFORMATION!

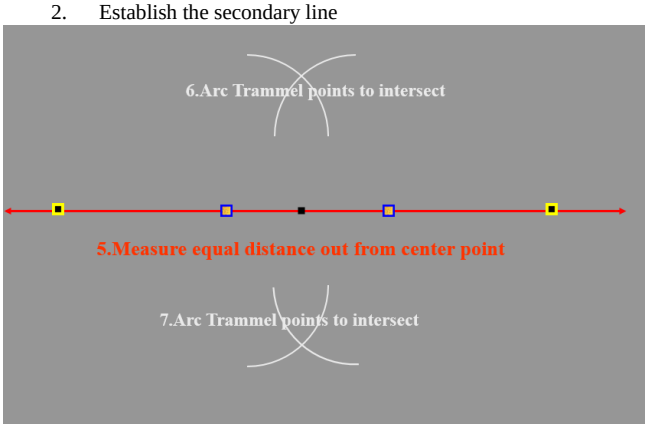
Before you begin using the following instructions, please refer to the Pre-Installation Job Prep information above.

Getting Started

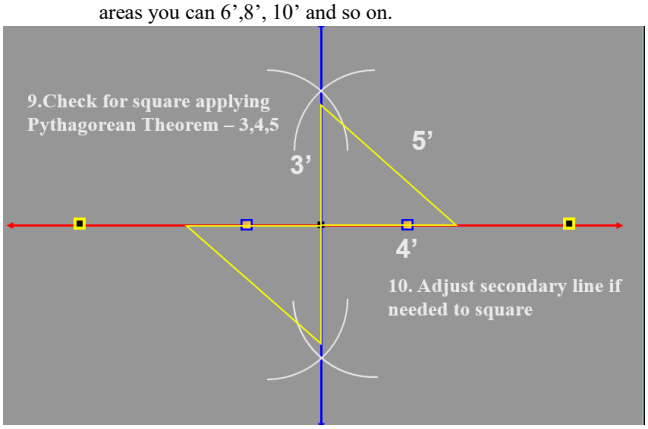
1. To begin with – Establish a primary line



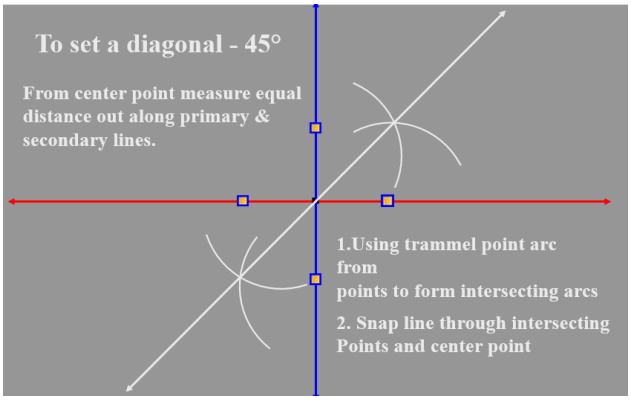
2. Establish the secondary line



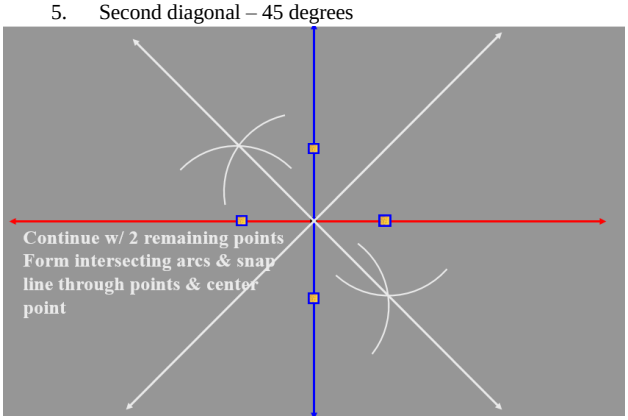
3. Once you have established the primary and secondary line check for square - use the 3',4',5' method otherwise known as Pythagorean Theorem. For larger areas you can 6',8', 10' and so on.



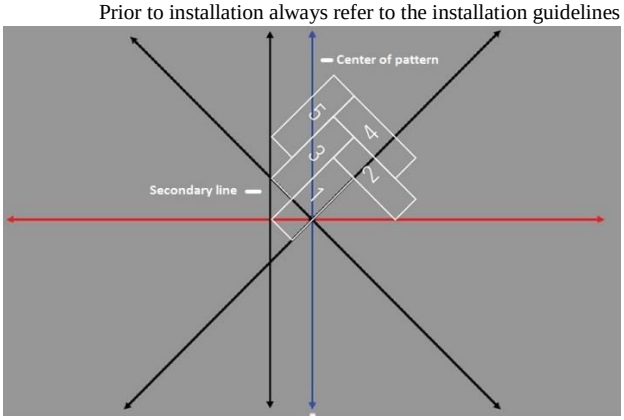
4. To set diagonals – first line - 45 degrees



5. Second diagonal – 45 degrees



6. Once all the lines are established the pattern can be laid from the primary lines or use the diagonal lines to install on a 45 degree angle. After you have determined the direction to install the pattern you will need to lay out 4 planks and establish reference lines (secondary) to keep the pattern from running off. Prior to installation always refer to the installation guidelines of the product for complete installation details.



7. Continue to install the pattern until you reach the far wall. Alignment is critical – if needed use a framing square to check alignment. Once you have reached the farthest wall work the pattern to the right, one row at a time and repeat. Then work the left side of the room until you reach the wall. Then repeat to fill the remaining quadrants.

Spreading the Adhesive

Using the proper trowel, hold the trowel at a 45° angle to ensure proper spread rate of adhesive. Apply pressure to allow the trowel to leave ridges of adhesive on the substrate with little adhesive left between the ridges. This will help to achieve the proper spread rate of the adhesive. Temperature and air flow across the adhesive can have an effect on the open time of the adhesive. 3N1 (or urethanes) will have a longer open time in areas of low humidity and will have a shorter open time in areas of high humidity. (See Adhesive label for further information).

NOTE: Never strike a rubber mallet or hammer directly on the flooring to engage the tongue-and-groove. This practice can damage the flooring and/or the finish. Remove the adhesive from the surface of the installed flooring as you work – this will help to save time. A damp rag with water or rubbing alcohol will remove adhesive. Frequently change towels to avoid leaving a haze on the flooring surface. **DO NOT** use water to remove Urethane adhesives from the finish. As you approach the end wall it may be necessary to cut the width of the last row – be sure to allow for the expansion space along the end wall. Once the final cuts are made set planks into place. Restrict foot traffic for a minimum of 6-8 hours and wait 24 hours before permitting moving of furniture onto the floor. Clean any wet adhesive from the flooring with a lightly dampened clean cloth. If the adhesive has dried, use rubbing alcohol on a clean cloth. For Urethane adhesive use the recommended urethane adhesive remover. Roll and cross roll floor with a 100-150 lbs. (45-70 kg) roller at the end of the installation to ensure proper transfer of adhesive.

Final Inspection: After the floor has been cleaned, inspect the floor for nicks, scratches, gaps or planks that may have moved during installation, as well as any other imperfections that need attention. Touch up nicks and scratches with touch-up products. In typical climates, the new floor can accept foot traffic within 24 hours. In areas where additional curing time is required, more time may be needed.

COMPLETING THE JOB – ALL INSTALLATIONS

- Sweep or vacuum floor
- Clean the floor with proper hardwood floor cleaner
- Install transition pieces -i.e. – thresholds, t-moldings, base boards and quarter round. Nail moldings to wall, not the floor.
- Inspect final floor for nicks and or minor gaps – fill with appropriate color wood putty.
- Unused material should be left with owner and stored in a dry place in case of future repairs are needed.
- Use plywood or hardboard when moving heavy appliances or furniture across floor.

Floor Protection During Construction: After installation, if you choose to protectively cover the floor, cover the floor completely, since some species are light-sensitive and uncovered areas may change color. Use a covering material with a vapor permeance (perm rating) of 1 perm or more (tested I accordance with ASTM E-96) to avoid trapping moisture/vapor on or within the floor. Any covering should be taped, using a low-adhesion tape, to base or shoe moldings. Avoid taping to finished flooring. When taping paper or sheets together, tape them to each other, not to the floor.

Moldings Help You Make Easy Transitions

T-Moldings: Used to create a transition between floor coverings of similar heights or to cover an expansion gap.
Stair Nosing: Used in conjunction with flooring installed on steps or provide a finished edge. Secure by gluing and nailing/ screwing down into place. Predrill holes to avoid splitting.
Reducer Strips: Used to transition floor coverings of differing heights- wood floor to vinyl, vinyl composition tile, or low-pile carpet. Can also be used to border a fireplace.
Thresholds: Used to transition floor coverings or to create a break between floor coverings – wood to carpet, can be used as a trim molding around fireplaces or sliding glass doors.
Shoe Base Moldings: Used to cover the expansion space between the floor and vertical surfaces. Can be used as a substitute for Quarter Round moldings when space is a limitation.
Quarter Round Moldings: Used to cover the expansion space between the Wall Base and your hardwood floor. You can also use them to make smooth transitions between the floor and cabinetry.
Wall Base Moldings: Can be stained and finished to the color of the flooring to be used an alternative to painted baseboards.

Floor Care and Maintenance

Remember, like any floor covering, our factory finished wood floors will show signs of wear over time, depending on the size and lifestyle of your family. By observing a few precautions and setting up a regular cleaning routine and maintenance program, you can expect years of beauty from your floor. The following are examples of the reasonable and necessary maintenance you are expected to perform. They are not intended to be an exclusive list.

1. Sweep or vacuum regularly since built-up grit can damage the surface of the wood. The vacuum head must be a brush or felt type. Be certain the wheels of the vacuum are clean and do not damage the finish. **Do not use a vacuum with a beater bar head**.
2. Remove spills promptly using a soft cloth and cleaning products recommended by the manufacturer.
3. **Never** wet-mop, damp-mop, or clean your floor with water or other products. This can severely damage the flooring and will void the warranties. Do not use hardwood floor cleaning machines or steam cleaners. See section on **Improper Maintenance**.
4. Use the manufacturer's recommended Hardwood floor cleaners with a clean terry cloth mop. Always sweep or vacuum the floors prior to using wood floor cleaners. **Do not** allow excess cleaner to remain on the floors surface as this may permanently damage the wood fiber.
5. **Important:** Do not use oil soaps, liquid or paste wax products or other household cleaners that contain citrus oils, lemon oil, tung oil, silicon, or ammonia since these warranties do not cover damage caused by non-recommended products. Use of these and other such products will harm the long-term performance of your floor and may also affect its recoat ability.
6. **Do not** use 2 in 1 cleaners with polish that may contain acrylics or urethane polish to restore gloss – the use of these products will void the finish warranty and may produce unsatisfactory results when not applied properly.
7. Keep pets' nails trimmed, and paws clean and free of dirt, gravel, grease, oil, and stains.
8. Place protective felt pads beneath furniture legs and feet to reduce scratches and dents. Replace pads as needed.
9. Use a dolly and protective sheets of plywood when moving heavy objects, furniture, or appliances.
10. Make certain furniture casters are clean and operate properly (a minimum 1" wide vinyl surface where it comes in contact with wood is recommended). Clean wheels periodically to remove dirt and debris.
11. Remove shoes with spiked or damaged heels before walking on floor.
12. Exposure to the sun and its UV rays accelerates the oxidation and aging of wood. This can cause the stain and/or wood to fade and/or to change color. We recommend that you rearrange rugs and furniture periodically so the floor ages evenly. Exotic species such as Brazilian Cherry are more susceptible to color change during the aging process. These warranties do not cover damage from the sun and its UV rays.
13. Use area rugs in high traffic areas and pivot points (e.g., stair landings, room entries, etc.), especially if you have a large family or indoor pets.
14. Maintain the proper Relative Humidity in your home between 35% - 55%. The use of a humidifier during heating seasons may help reduce shrinkage of the wood due to low humidity.