

# Installation Guidelines

## ENGINEERED WOOD FLOORING

Our flooring products come with a Lifetime Structural (Residential) Warranty/ 50-Year Residential Finish Manufacturer Warranty/ 15-Year Light Commercial Finish Warranty. The warranty applies to the original purchaser of the flooring only and guarantees that the surface will not wear-through or peel off for the duration period not to exceed 50 years. Wood is a natural product which may lead to some color variation from board to board. Installation of the product confirms your acceptance of the product. Failure to follow Pre-Installation and Installation guidelines will void the manufacturer's warranty. The warranty does not cover damage from improper use, care or maintenance, including scratching, exposure to moisture and humidity, water damage, denting, fading, or staining. Please review our Warranty coverage information for specific terms and conditions.

### PLEASE READ CAREFULLY BEFORE INSTALLING

Thoroughly examine the flooring prior to installation for grade, color, finish and quality. Ensure adequate lighting for proper inspection. If flooring is not acceptable, do not install the floor. Please contact the seller immediately and arrange for replacement. The NWFA states that up to 5% of material may be culled for blemishes or defects without being considered defective. Please note our products contain a standard pattern variation and installers should be working from multiple open boxes to ensure boards are blended throughout. The manufacturer cannot accept responsibility for installation of flooring with visible defects. Installation of this product warrants the acceptance by the installer or owner for the quality of the material, as well as conditions in which the material is being installed therein.

**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 associated with the hardwood flooring that are related to or attributed to improper jobsite conditions. Any splits, cracks, grain raising, checking, edge fracturing, splintering, cupping, crowning/peaking, warping, twisting, expansion/contraction, buckling or chipping that occurs during or after the floor has been installed and as a result of abuse, misuse, improper maintenance or care, exposure to excessive or insufficient moisture, improper environmental conditions including excessive heat from radiant heat systems are not covered under the manufacturer's warranty.**

Prior to installation of any flooring, the installer must ensure that the jobsite and subfloor meet the requirements of these installation instructions. All necessary accessories, including trim, must be present at the jobsite prior to beginning installation. The manufacturer is not responsible for flooring failure resulting from unsatisfactory jobsite and/or subfloor conditions.

When purchasing flooring, per NWFA guidelines we recommend adding 5%-15% to actual square footage needed for cutting allowance and to compensate for culled material. It is acceptable, per the NWFA guidelines, that up to 5% of material be outside the range of acceptance.

Natural Wood/Prefinished Engineered & Solid wood flooring products are not appropriate for full bathroom installations; powder rooms (without shower/tub) are considered acceptable.

It shall be the responsibility of the Installer to document installation date, product SKU and Lot information, duration of product acclimation, flooring moisture content, subfloor moisture content, site relative humidity and site temperature. This information must be documented by the installer and a copy provided to the property owner to ensure product warranty coverage. Failure to follow any and all of the recommended installation guidelines will void warranty coverage.

## Jobsite & Pre-Installation Guidelines

Wood flooring should be one of the last items installed for any new construction or remodel project. All flooring products must be installed per the manufacturers and NWFA installation guidelines. For more information about NWFA guidelines please contact [www.NWFA.org](http://www.NWFA.org) or to speak directly to a NWFA representative please contact 500-443-WOOD (9663). Please note there may be a fee for this service.

- All “wet” work – i.e. – paint, drywall, concrete, masonry, plumbing must be complete and dry prior to the 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 and products must be installed using an appropriate moisture barrier or retarder. Please refer to [NWFA.org](http://NWFA.org) for specific regional guidelines.
- HVAC should be on, operational and maintained between 60 – 80 degrees with a relative humidity of 35%-55% range a minimum of 5 days prior to delivery, during and after installation of the flooring.
- We recommend using a Hydrometer to monitor interior climate and the use of a humidifier/dehumidifier may be required.
- 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.
- Test wood sub floors and wood flooring for moisture content using moisture meter recommended for wood flooring, such as Lignomat SDM or comparable. 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 2% for planks greater than 3” wide and 4% for planks less than 3” wide of the subfloors moisture content. Please refer to the NWFA moisture content by area map for specific requirements.
- Test the concrete subfloor’s moisture content by calcium chloride testing or by using an appropriate moisture meter. 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. The moisture vapor emission rate for concrete subfloors must not exceed 75% RH using ASTM 2170 or 3 pounds per 1000sqft per 24 hours using Calcium Chloride test ASTM 1869. If using a moisture meter, please refer to the recommended guidelines set forth for by that moisture meters’ manufacturer.
- 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 in accordance with local regulations.

### **ALWAYS CHECK MOISTURE LEVELS BEFORE INSTALLING**

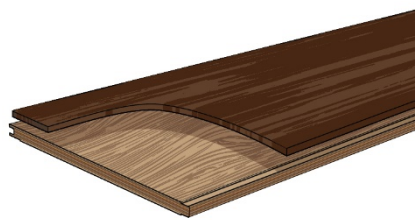
#### **Preparing and leveling the sub-floor**

1. The subfloor needs to be structurally sound; do not install over particle board. Please refer to NWFA guidelines for sound substrate qualifications.
2. The sub-floor should be free of any surface defect. If it is not, fill gaps with a Portland-based leveling cement (for concrete floors only) or sand/grind down any uneven areas. For wood floors, use a wood leveling patch or skim coat as needed.
3. The sub-floor must be level and flat to 3/16” (5mm) per 10’ radius or 1/8” (3.2mm) per 6-foot radius.
4. Any gaps in the sub-floor should not exceed 3/16” (5mm).
5. Use flooring screws into floor joists if necessary to minimize squeaks in subfloor.
6. The surface must be clean and free of any contaminants such as wax, paint, grease, dust, oil, nails, staples, old adhesive, etc. and thoroughly swept and free of all debris.

7. For concrete installation, ensure that the concrete is not low-density (below 3000 psi) or gypsum based.
8. Plywood must be CDX-rated at least 3/4" thick. OSB must be 3/4", PS2 rated, and installed sealed-side down. We required wood substrates as previously described to be affixed directly to joists and a max of 16" on center.
9. Moisture content should not exceed 12%

### Acceptable Installation Methods

	Engineered
Above Grade	Glue or Staple
On Grade	Glue or Staple
Below Grade	Glue or Staple



Engineered Wood Flooring

### Inspect the Flooring

Inspect material for color, finish, milling, texture and grade. Set aside pieces that may not be acceptable once installed. A maximum of four boxes may be opened for inspection prior to installation. The floors have been thoroughly inspected during the manufacturing process, but it is the responsibility of the installer/homeowner to do final inspection and cull-out boards that are not acceptable before installation.

### Acclimation

- Store this flooring at the installation area before installation to allow the flooring to acclimate and adjust to room temperature and humidity.
- Do not open or remove product from cartons during acclimation.
- Do not store directly on concrete or near outside walls.
- Flooring should be kept in the location of install and stacked in an alternating pattern allowing sufficient space for air to circulate.
- Do not install the flooring until the moisture content of the subfloor where the flooring will be installed is within 2% for planks greater than 3" wide and 4% for planks less than 3" wide from the moisture content of the flooring.

- Minimum acclimation time is 72 hours. The manufacturer recommends 7-10 days acclimation time for optimization. Be sure to check moisture content periodically to ensure it has reached its optimum content with little to no change.
- If you do not allow the flooring sufficient time to acclimate and the moisture content of the flooring exceeds that of the subfloor, the flooring will continue to contract after installation and gaps may develop between the flooring. Likewise, if the moisture content of the flooring is less than that of the subfloor, the flooring may expand and/or cupping may develop.

### **Blending of Cartons**

To achieve a uniform appearance across the entire floor, we require that you open and work from a minimum of four cartons at a time and lay out the flooring ahead of time. Be sure to mix the planks for the best aesthetic appearance. Make certain the room is well lit to ensure color is consistent and that any visual defects can be seen and removed prior to installation. “Racking the Floor” is essential to achieve a random appearance. Start by cutting several boards in random lengths, differing the lengths by at least six inches. As you continue working across the floor remember to maintain a six-inch minimum space between the end joints. Randomly install different lengths to avoid a patterned appearance. Never waste materials; the end cuts from starter rows should be used at the opposite side of the room to complete rows or may be used to start the next row.

### **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. Failure to undercut casings will result in automatic void in warranty coverage.

### **Expansion Space**

An expansion space of 1/2” must be left around the perimeter of the room and at all vertical obstructions. More or less spacing may be needed depending on the geographical region, interior climate, and or time of the year. Your wood flooring WILL move/shrink/expand. This is a normal occurrence of a natural product.

### **Coordinating Transition Moldings**

Always have all necessary transition moldings on site prior to beginning installation. Make sure all transitions and moldings have been coordinated with planks that have similar color and graining. Set them aside for use when a transitioning is necessary. The manufacturer cannot be held liable for color variations that may exist between flooring and coordinating trim accessories under any circumstances.

### **Adhesive**

The manufacturer recommends the use of a low-VOC, premium, water-free flooring adhesive specifically recommended by the adhesive manufacturer for use with engineered wood flooring. Please refer to adhesive manufacturer’s instructions for appropriate trowel size and installation tips.

### **Floor Protection During Construction**

Always protect the surface of the installed flooring during construction. Cover the floor with quality rosin paper or other paper that will allow the floor to breathe and secure it to the baseboards; never tape directly to the wood. Do not use plastic or polyethylene sheeting to cover the floor since they will trap moisture that will damage the flooring. The flooring must be cleaned and completely free of any and all debris to minimize damage.

If you have any questions regarding installation of flooring not addressed in our guidelines, always refer to the most recent NWFA installation guidelines.

## Radiant Heat Installations

The following guidelines must be followed to maintain warranty coverage. Failure to follow ALL guidelines will result in termination of warranty coverage.

- Concrete must be allowed to properly cure and dry a minimum of 4 weeks prior to operation of radiant heat system.
- Over concrete, moisture vapor emission rate for concrete subfloors must not exceed 3 pounds per 1000 sf per 24 hours using Calcium Chloride test ASTM 1869, or 75% RH using ASTM 2170 k and must be documented for warranty coverage.
- Wood subfloors must not exceed 12% moisture content and be within 2% moisture content as that of the wood flooring.
- Subfloor must be flat to 3/16" over a 10' radius or 1/8" over a 6' radius.
- T-moldings must be used to separate heating zones.
- Operation of radiant heat system should be set to run at 2/3 of the maximum output for a minimum of 2 weeks prior to installation of flooring to further allow moisture from concrete to dissipate and reach a final moisture content. **This must be done in both heating AND non-heating seasons.**
- The use of a separate thermostat for each individual zone is required. An outdoor temperature sensor is highly recommended to adjust temperature according to anticipated heat loss.
- Reduce heat to a temperature of 65° 4 days prior to installation
- For direct Glue down - Turn the heat off for 24 hours before, during and an additional 24 hours after installation. Failure to turn heat off may reduce working time of the adhesive. Follow all adhesive guidelines set forth by adhesive manufacturer.
- After 48 hours post-installation, we recommend to slowly raise the temperature of the heating system to its preferred operating level. Please exercise caution and expect to achieve peak after a period of 5 days.
- Do not allow the surface temperature to exceed 80°F with no more than a 5°F variance in surface temperature over a 24-hour period.
- Relative humidity of the jobsite must be maintained between 35-55% relative humidity. The use of a humidification/dehumidification system may be required to maintain the proper humidity level. Failure to maintain proper humidity level can result in excessive dryness of flooring and void the warranty.
- Seasonal expansion and contraction is expected and does not mean a defect is present within the product.

## GENERAL INSTALLATION TOOLS

- Moisture Meter
- Chalk Line
- Crow Bar or Pry Bar
- Tape Measure
- Hand Saw or Power Saw
- Wood or Plastic Spacers (1/2")
- Pencil
- Tapping Block
- Hammer or Rubber Mallet

## FOR GLUE-DOWN INSTALLATION, YOU WILL ALSO NEED:

- Premium Wood Flooring Adhesive
- Adhesive trowel (as recommended by adhesive manufacturer)

## FOR NAIL-DOWN/STAPLE INSTALLATION, YOU WILL ALSO NEED:

- Air stapler/nailer compatible with profile of the flooring material
- 15 lb. felt or asphalt impregnated Kraft paper
- 1 3/4" to 2" 16-gauge cleats or staples
- Crow bar or pry bar
- Finish nailer and/or finish nails
- Color-matching wood putty/filler
- Nail set

## FOR TONGUE AND GROOVE INSTALLATION, YOU WILL ALSO NEED:

- Strap Clamps
- Tongue and Groove Glue
- Underlayment Pad: 1/8" thick Two-in-One pad (pad plus vapor barrier) or 1/8" thick pad with 6mil poly film sheeting beneath

## GLUE-DOWN INSTALLATION INSTRUCTIONS

The manufacturer recommends the use of a low-VOC, premium, water-free flooring adhesive specifically recommended by the adhesive manufacturer for use with engineered or solid wood flooring.

### Step One - Establish a Starting Point

1. Remove any existing wall base, shoe molding, quarter round or doorway threshold.
2. Determine the direction of the floor joists and run the flooring perpendicular (90°) to the floor joists. Do not run flooring parallel to floor joists.
3. Flooring may be installed in any direction over a concrete slab.
4. Establish a starting point. We recommend the longest exterior running wall.
5. Measure the total width of the flooring (including the tongue), plus 1/2" for expansion. Measure out this distance in at least 2 places from the starting wall and 12" from the corners. Snap a chalk line parallel to the starting wall.

### Step Two - Lay Out

1. Choose the longest and straightest boards and align the plank's tongue with the working line. Cut the last plank to the proper length leaving a 1/2" from the end wall. Lay out three additional rows, then move these rows away from the working area.
2. Spread enough adhesive to just cover the area of the first four rows of flooring using the appropriate trowels and installation technique. Please refer to the adhesive manufacturer's instructions for application. **Never use a "wet-lay" adhesive, as this could trap moisture under the flooring, causing it to warp.**
3. Place flooring onto adhesive, one row at a time, making sure that all joints are tight and parallel. Be sure to use 100-150 lb. weighted roller to ensure complete transfer of adhesive; always protect the floor when using weighted roller.
4. Allow the adhesive to set per the adhesive manufacturer's recommendation. It is critical to check your work, making sure the starting row is properly aligned and straight.

### Step Three – Rack the Floor

1. Once the first four rows are in place, continue to lay out the planks. Remain working from at least four open cartons. Be sure to blend the planks and stagger the end joints a minimum of 6" apart to ensure a favorable appearance. Avoid H-Joint and other repeating patterns in the floor.

### Step Four - Installation of Flooring

1. Once the rows are laid out, begin to trowel out adhesive according to manufacturer's instructions. Begin placing flooring onto adhesive, one row at a time, making sure that all joints are tight and parallel.
2. When installing near a solid object or wall, leave a minimum of 1/2" as required expansion space.
3. It may be necessary to rip the last row to allow for the 1/2" expansion. If the last row is 1" or less, glue the pieces to the last full uninstalled row and install them together. If needed, use a pry bar to fit the remaining rows tight to the installed planks.
4. When installation is complete, use wedges or spacers to hold wood in place while adhesive dries. Spacers may be removed after initial setting of adhesive to allow for normal expansion of wood.
5. Roll and cross-roll floor with a 100-150 lb. roller at the end of the installation to ensure proper transfer of adhesive. Be sure the flooring is cleaned and completely free of any and all debris to avoid damage.

### Step Five - Completing the Job

1. Clean the floor with pre-finished hardwood cleaners such as; Bona®
2. Install transition pieces -i.e. – stair nose, reducer, end cap, t-molding and base shoe. Please follow manufacturer's installation guidelines for transitions.
3. Inspect final floor for nicks and or minor gaps – fill with appropriate color wood putty/filler.
4. Any unused material should be stored in a dry place in case future repairs are needed. We recommend saving at least 2 boxes.

## NAIL DOWN/STAPLE INSTALLATION INSTRUCTIONS

### Step One - Establish a Starting Point

1. Remove any existing wall base, shoe molding, quarter round or doorway threshold.
2. Determine the direction of the floor joists – Run the flooring perpendicular (90°) to the floor joists. Do not run flooring parallel to floor joists per NWFA Guidelines.
3. Prior to installing flooring, roll out 15 lb. felt or asphalt impregnated paper in the same direction of the flooring. Overlap each row by 3” to 4”. This process will help to keep the floor clean and help to retard moisture from below.
4. Establish a starting point. We recommend the longest exterior running wall.
5. Measure the total width of the flooring (including the tongue), plus ½” for expansion. Measure out this distance in at least 2 places from the starting wall and 12” from the corners. Then, snap a chalk line parallel to the starting wall.

### Step Two - Lay Out

1. Choose the longest and straightest boards and align the plank’s tongue with the working line. Cut the last plank to the proper length leaving a ½” from the end wall.
2. Top nail the boards into place approximately 6” apart and 1” from the back edge (groove side) using a pneumatic nailer; Always use a nail set to sink the nail heads below the surface of the flooring. Remember to fill the holes with matching wood putty/filler.
3. Continue to blind nail by hand each succeeding row until the nailer/stapler can be used to install the flooring. It is critical to make sure the starting row is properly aligned and straight.
4. If necessary, we recommend pre-drilling pilot holes spaced 6” to 8” apart at a 45° angle along the tongue and blind nail the plank. Be sure to countersink the nails with a nail set.

### Step Three – Rack the Floor

1. Once the first four rows are in place, continue to lay out the planks. Remain working from at least four open cartons. Be sure to blend the planks and stagger the end joints a minimum of 6” apart to ensure a favorable appearance. Avoid H-Joint and other repeating patterns in the floor.

### Step Four - Installation of Flooring

1. Once the initial row is in place, begin installing the planks using either a manual or pneumatic nailer/stapler using 16-gauge cleats staples. Check to ensure the fastener is set to the proper depth and angle by adjusting the nailer/stapler shoes. Blind nail through the tongue using a minimum 1 ½”- 2” staple or cleat; fasten the planks approximately 2” to 3” from the ends and every 8” apart with a minimum of 2 fasteners per plank.
2. Continue installing planks across the room and ending at the far wall using the manual or pneumatic nailer/ stapler and following the recommended nailing schedule. Remember, never waste materials; the end cuts from starter rows should be used at the opposite side of the room to complete rows or to start the next row. As you reach the far wall it may be necessary to blind nail by hand until top nailing is required.
3. It may be necessary to rip the last row to allow for the 1/2” expansion. If the last row is 1” or less glue the pieces to the last full uninstalled row and install them together. If needed, use a pry bar or lever to fit the remaining rows tight to the installed planks.
4. Top nail the last 1-2 rows into place approximately 6” apart and 1” from the back edge (groove side) using a pneumatic finish nailer. Always use a nail set to sink the nail heads below the surface of the flooring. Remember to fill the holes with matching wood putty/filler.

### Step Five - Completing the Job

1. Clean the floor with pre-finished hardwood cleaners such as; Bona®
2. Install transition pieces -i.e. – stair nose, reducer, end cap, t-molding and base shoe. Please follow manufacturer’s installation guidelines for transitions.
3. Inspect final floor for nicks and/or minor gaps – fill with appropriate color wood putty.
4. Complete Warranty Registration Form
5. Any unused material should be stored in a dry place in case future repairs are needed. We recommend saving at least 2 boxes.

## FLOATING INSTALLATION INSTRUCTIONS

This Engineered Wood Flooring can be installed as a floating floor system over almost all types of subfloors including Plywood, OSB, Existing Wood Floor, Vinyl, Vinyl Tile, and Ceramic Tile provided they are clean, flat, dry and structurally sound, meeting the requirements outlined above under 'Subfloor Conditions.

### Step One - Establish a Starting Point

1. Remove any existing wall base, shoe molding, quarter round or doorway threshold.
2. Determine the direction of the floor joists – Run the flooring perpendicular (90°) to the floor joists. Do not run flooring parallel to floor joists per NWFA Guidelines.
3. Establish a starting point. We recommend the longest exterior running wall.
4. If installing over underlayment pad plus a separate layer of polyfilm, install the 6 mil polyfilm first, taping all seams with waterproof tape, and then install the pad. Roll out the first run of pad from wall to wall parallel to the starter wall.
5. On the installed pad mark two points toward each end of the starting wall and chalk a line the full length of the wall through the marks. This is the starter line.
6. Measure the total width of the flooring (including the tongue), plus ½" for expansion. Measure out this distance in at least 2 places from the starting wall and 12" from the corners. Then, snap a chalk line parallel to the starting wall.

### Step Two - Lay Out

Lay the first row of flooring using only long boards. The first flooring board and the last flooring board in this row should be a minimum of 12" long and cut to provide the appropriate expansion space on each end.

Apply a 1/8" continuous bead of T&G glue on the bottom side of the groove of each end joint. Align the tongue side of the starter row along the chalk line and engage the end joints together.

Use shims along the long wall and at both ends of the row to keep the floor in place and maintain the right expansion space.

Use cut ends to start the next row, discarding any pieces shorter than 8".

start the next row, discarding any pieces shorter than 8".

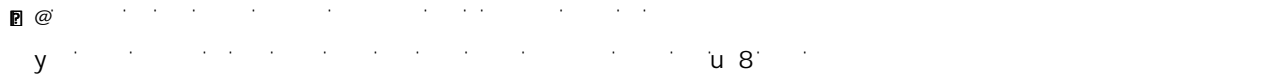


### Step Three – Rack the Floor

1. Once the first four rows are in place, continue to lay out the planks. Remain working from at least four open cartons. Be sure to blend the planks and stagger the end joints a minimum of 6" apart to ensure a favorable appearance. Avoid H-Joint and other repeating patterns in the floor.

### Step Four - Installation of Flooring

☑ Continue ~~to~~ installing planks across the room and ending at the far wall. Remember, never waste materials; the end cuts from starter rows should be used at the opposite side of the room to complete rows or to start the next row.



It may be necessary to rip the last row to allow for the 1/2" expansion. If the last row is 1" or less glue the pieces to the last full uninstalled row and install them together. If needed, use a pry bar or lever to fit the remaining rows tight to the installed planks.





## Step Five - Completing the Job

1. Clean the floor with pre-finished hardwood cleaners such as; Bona®
2. Install transition pieces -i.e. – stair nose, reducer, end cap, t-molding and base shoe. Please follow manufacturer’s installation guidelines for transitions.
3. Inspect final floor for nicks and/or minor gaps – fill with appropriate color wood putty.
4. Any unused material should be stored in a dry place in case future repairs are needed. We recommend saving at least 2 boxes.

## Care & Maintenance

With today’s advances in wood flooring stains and finishes, cleaning prefinished floors has never been easier. There are other steps you can take to minimize maintenance and maintain the beauty of your prefinished floors. Regular maintenance requires little more than sweeping with a soft bristle broom if your wood floor includes a beveled edge that could collect debris.

- Clean your floors periodically with a professional wood floor cleanser. The manufacturer recommends *prefinished* hardwood flooring cleaners such as Bona®.
  - For moderately soiled areas, use a mild solution of isopropyl (rubbing) alcohol and distilled water. Dilute the mixture by mixing one-part alcohol and 2 parts distilled water. For tougher spots, use a higher concentration of isopropyl alcohol and distilled water. Always spot test in an inconspicuous area.
- Avoid using any cleaning agents containing wax, oil or polish. Left over residue will form a dull film.
- Do not use sheet vinyl or tile floor care products on wood floors. Self-polishing acrylic waxes can cause the surface to become slippery and appear dull quickly.
- Do not use vinegar as a cleaning solution, its acidic properties will harm the finish.
- Use area rugs both inside and outside doorways to help prevent grit, dirt and other debris from being tracked onto your floor. Please use a breathable rug pad underneath all throw rugs to prevent scratching.
- Place an area rug in front of the kitchen sink
- Do not wet-mop a wood floor. Standing water can dull the finish, damage the floor and leave a discoloring residue.
- Wipe up spills immediately.
- Protect your floor with floor protectors made of non-staining felt under the legs of furniture to help prevent scuffing and scratching; Larger pads may be required on bigger objects. Scratching due to insufficient protection are not covered under by the warranty.
- Avoid walking on your wood floors with cleats, sports shoes and high heels.
  - A 125-pound woman walking in high heels has an impact of 2,000 pounds per square inch. An exposed heel nail can exert up to 8,000 pounds per square inch. This kind of impact can dent any floor surface.
- When moving heavy furniture, do not slide it on wood flooring. It is best to pick up the furniture completely to protect the wood flooring.
- Use a humidifier throughout the winter months (or dehumidifier in the summer months) to keep wood movement and shrinkage to a minimum
- Use a Hydrometer to monitor interior climate temperature and RH year-round. The use of a humidifier/dehumidifier may be required to maintain proper conditions. Consult a local HVAC vendor for information on maintaining.

## Floor Repairs

- Very light and small surface scratches can be repaired with a staining “touch up” pen of the appropriate color or by using an almond stick. Please refer to manufacturer’s recommendations on proper application.
- Slightly deeper scratches can be repaired by means of colored putty and or stains. Fill the scratches with the putty, level with putty knife and use terry cloth towel to wipe off excess.
- Very deep scratches may require the replacement of planks.