



WARRANTY, INSTALLATION & MAINTENANCE FOR
SUPERIOR HARDWOOD FLOORING,
SUPERIOR ENGINEERED FLOORING &
ENHANCED HARDWOOD FLOORING

A guide to proper installation, maintenance, and care of your floor.

SUPERIORFLOORING.CA



IMPORTANT INFORMATION

You've made the right decision choosing a Superior Flooring product. Your flooring is a premium product that is designed to stand up to the challenges of modern-day living. Superior Flooring is manufactured by Herwynen Sawmill Ltd. under strict hardwood flooring industry standards which permit a defect tolerance of up to 5% of the quantity required. Customers are advised to purchase more than the total square footage required for the application to cover cutting, waste, and defect tolerance. We recommend 5% extra for all Superior Flooring products and 8% for all Enhanced Hardwood Flooring products. All pieces must be inspected before actual installation and any piece which does not meet the installer or owner's personal standard must not be installed.

Pieces not installed because of colour variation, appearance, length, or personal subjective standards are not considered defective. The installer is considered to have the final responsibility to determine which pieces are installed. Once the board is installed, it is deemed acceptable by both parties. The installer or homeowner is fully responsible for all installed hardwood flooring.

GENERAL WARRANTY & CLAIMS INFORMATION

GENERAL WARRANTY INFORMATION

This warranty is available to the original purchaser of the product and is limited to the repair, refinishing, or replacement of the defective board or boards. If an acceptable resolution is not possible, Herwynen Sawmill Ltd. will refund the original purchase price of the defective floor. This is done on a pro-rated basis, based upon the proportion of the floor that is determined by Herwynen Sawmill Ltd., acting reasonably, to be defective. This warranty will be null and void if any replacement or attempts to repair are conducted without the knowledge and approval of Herwynen Sawmill Ltd. Herwynen Sawmill Ltd. will not be liable for any consequential or other additional damages beyond those stated above. The limitations on liability expressed in this document shall nevertheless apply to the relationship between the end user of this product and Herwynen Sawmill Ltd.

LIMITED STRUCTURAL WARRANTY

Every piece of Superior Flooring is subjected to many strict quality control inspections. Excluding a 5% allowance, Herwynen Sawmill Ltd. warrants to the original purchaser that its product in its original manufactured and purchased condition will be free from milling defects and structural deficiencies for the lifetime of the floor. This is the only structural warranty extended to the hardwood floor materials manufactured by Herwynen Sawmill Ltd. and all implied warranties including statutory warranties of any kind are expressly excluded.

KNOW YOUR FLOORING NAMES

Superior Hardwood Flooring = Solid Hardwood Flooring

Superior Engineered Flooring = Engineered Hardwood Flooring

Enhanced Hardwood Flooring = Engineered Hardwood Flooring

WEAR LAYER WARRANTY

Herwynen Sawmill Ltd. warrants to the original purchaser that, under conditions which normally exist in a single-family residence, the finish wear layer of our pre-finished hardwood flooring will not wear through or peel from the wood for thirty-five years with the time calculated from the date of purchase by the original purchaser. This warranty is valid provided that regular maintenance as specified in this document is performed on a regular basis on the floor and the floor is properly installed. This is the only finish warranty extended to the hardwood floor materials manufactured by Herwynen Sawmill Ltd. and all implied warranties including statutory warranties of any kind are expressly excluded.

EXCLUSIONS

This warranty does not extend to or cover scratches, indentations, damage by neglect or any other damage caused by improper handling, storage, installation, environmental extremes outside our acceptable ranges, improper maintenance, insufficient protection, misuse or improper alterations of the original manufactured product, water damage, fire damage, improper installation, improper use of in-floor heating, substandard subfloors, discoloration due to variations in the exposure to sunlight, furniture transfer marks on the floor, spiked heel shoes, pets, and insects. Furthermore, checking and cracking caused by improper moisture control is not covered by this warranty as all wood floors will expand and contract with the change of seasons. In addition, your warranty will not be valid if our products are installed over an existing floor or a crawl space with an exposed earth floor, or improperly over radiant heat.

The damaged or otherwise unsatisfactory part of the floor which is subject to a claim under this warranty must be easily noticeable from a regular standing position, and cover at least 15% of the total floor area covered by the hardwood flooring in the application which is to be subject to a claim under this warranty.

This warranty will be null and void in the event that the product is not registered within 30 days of the purchase date.

You can register your warranty by visiting superiorflooring.ca/warranty-registration



CLAIM PROCEDURES

Claims are made first by contacting the dealer from whom the product has been purchased. If such dealer is not able to resolve the problem, or they have determined that the issue at hand is a manufacturer's defect, then that dealer must contact Herwynen Sawmill Ltd. Claims will only be considered for review if an authorized Superior Flooring reseller contacts Herwynen Sawmill Ltd in this manner.

By making a claim against the warranty, the person claiming shall be deemed to acknowledge the right of Herwynen Sawmill Ltd to attend the premises in which the floor is installed and remove any samples required to determine the cause and condition for which the claim has been made.

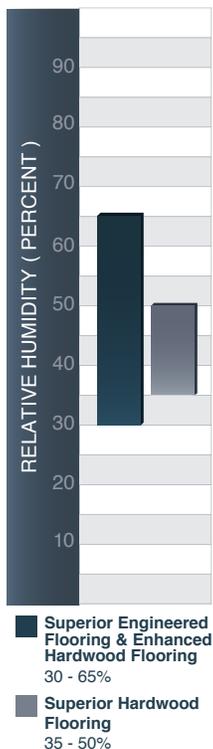
INSTALLATION

Please read this guide carefully for instructions on installation, maintenance, and care of your new hardwood floor.

STORAGE & HANDLING

Your hardwood floor is a natural organic product which is affected by the humidity levels in the air around it. Both before and after installation it will absorb or release moisture. Wood is a natural material that seeks to be in balance with its surroundings. Hardwood destined for use in wood floors is carefully kiln-dried for that purpose. Typically, hardwood will expand during the summer months and shrink in the winter. Acceptable humidity levels (**Chart 1**) should be maintained at all times in the rooms where your floor is installed. You will receive the wood for your floor in specially designed cartons that have been stored in a controlled environment. These conditions must be maintained throughout shipping, installation, and thereafter.

CHART 1



The following considerations are important, and failure to follow them will void your warranty.

ACCLIMATION

Herwynen Sawmill Ltd. will not warranty Superior or Enhanced Flooring products that aren't stored and installed within the relative humidity range specified in Chart 1. Superior and Enhanced Flooring products should not be stored on the construction site or acclimatized before install.

SUBFLOOR MOISTURE CONTENT

Measure the moisture content of the sub floor and the hardwood to be installed using a moisture meter. The moisture reading of the sub floor must be between 6% and 12% maximum. Hardwood strips must be under 2% maximum difference when compared to the sub floor. If the moisture content of the sub-floor is too low or high, postpone installation. Increase ventilation or use a humidifier or dehumidifier to adjust moisture levels before installation.

SUBFLOOR DESIGN

For wood sub-floors, hardwood flooring must be installed on plywood or OSB over joists. If the existing sub floor consists of particle board, then it will be necessary to overlay it with at least 5/8" plywood before installation. Be sure hardwood flooring is installed over industry standard sub-floors and underlayment, which as a minimum standard, must be 5/8" A.P.A. approved C.S.P/D.F.P. plywood C.O.F.I stamped, 23/32" or thicker O.S.B. underlay grade PS2-92, or 5/8" tongue and groove boards.

RELATIVE HUMIDITY

Drywall, plaster and concrete must be completely dry and the heating system fully operational with the temperature maintained at 22°C for one to two weeks before the flooring is delivered to the site. All concrete in the structure must have cured for at least 30 days.

GENERAL INSTALLATION GUIDELINES

- 1) Undercut any door-jamb on the bottom of the door frames the thickness of the flooring to permit a hardwood strip to be inserted under them.
- 2) Hardwood flooring must be installed across the joists at a 90-degree or 45-degree angle for support. Installation should be done under natural light conditions.
- 3) Your starting location should be the longest and straightest wall within the room.
- 4) Adequate expansion space must be envisioned for the installation of all mouldings. Different installation methods require different expansions space.
- 5) Never attach mouldings to the hardwood flooring **(see Image 1 on page 5)**. Take care when installing the moulding to ensure that it will not inhibit the floor's ability to move. Quarter round and baseboards are to be nailed only to the wall and never to the floating floor.
- 6) If heavy tools or other objects are dropped on the floor, they will damage it. Clean the bottom of any footwear worn during installation.

NAIL DOWN INSTALLATION

(SUPERIOR HARDWOOD FLOORING, SUPERIOR ENGINEERED FLOORING & ENHANCED HARDWOOD FLOORING)

PREPARATION INSTRUCTIONS

- 1) Remove baseboards, quarter rounds, and then screw nail off sub floors securely to avoid squeaking if necessary. The sub-floor must be clean, dry, smooth and flat.
- 2) Use **Chart 2** to determine which fasteners are applicable to the flooring you are installing. Note that Superior Flooring recommends the use of cleats on our solid hardwood. Dimpling (tiny bumps at the edge of the strip) is caused using a staple gun and is not considered a manufacturing defect.

CHART 2

PRODUCT	FASTENER	DISTANCE BETWEEN FASTENERS	DISTANCE FROM ENDS	MINIMUM LENGTHS
Superior Hardwood Flooring 3/4" - 2 1/4"	16 ga L type cleat (Primatch P250AL)	8" to 10"	1" to 3"	1 3/4"
Superior Hardwood Flooring 3/4" - 3" or wider	16 ga L type cleat (Primatch P250AL)	6" to 8"	1" to 3"	1 3/4"
Enhanced Hardwood Flooring 3/4"	18 ga L type cleat (Primatch Q550) or 15.5 ga 1/2" staple (Primatch P250AS)	8" to 10"	1" to 3"	1 3/4"
Superior Engineered Flooring 3/4"	16 ga L type cleat (Primatch P250AL) or 15.5 ga 1/2" staple (Primatch P250AS)	8" to 10"	1" to 3"	1 3/4"
Superior Engineered Flooring 1/2"	18 ga 1/4" crown staple (Primatch Q180) or 18 ga L type cleat (Primatch Q550)	4" to 5"	1" to 3"	1 1/2"



INSTALLATION INSTRUCTIONS

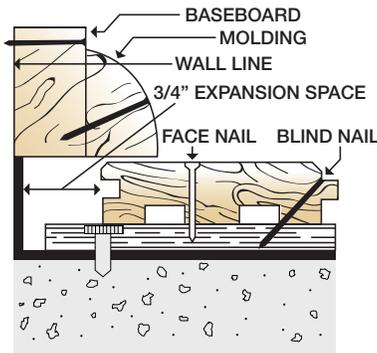
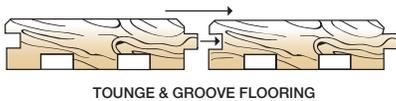


IMAGE 1

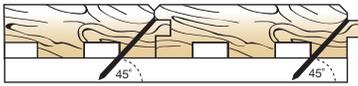


IMAGE 2

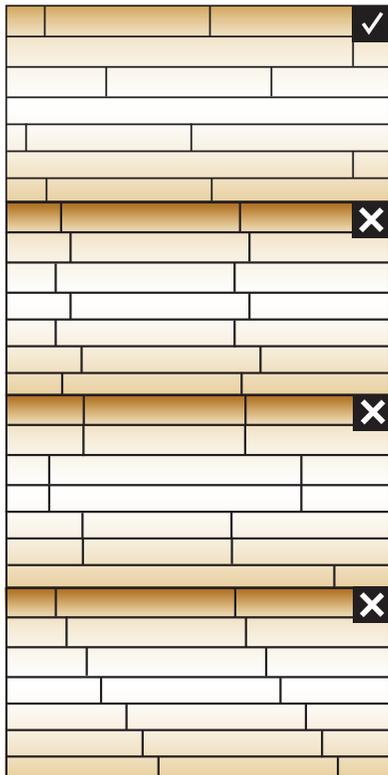


IMAGE 3

1. Roll out the vapour retarder paper the length of the room. Cut it so it touches the outside walls, and over-lap the inside edges 3" to 5" to completely cover the floor space of the room. Vapour retarder paper is the NWFA recommendation as an underlayment for hardwood flooring. We recommend Aquabar "B", Silicone Vapor Sheild, or any product with a vapour permeance (perm rating) of greater than or equal to .7 and less than or equal to 10 when tested in accordance with ASTM E-96 method A.
2. At the starting location, measure out the width of a hardwood strip plus 3/4" (for expansion). Mark this with a chalk line against which you will place the tongue of your starter strip. The groove edge of the first strip is laid 3/4" from the starting wall to leave room for expansion (**see Image 1**). The 3/4" expansion will be needed around the perimeter of the room.
3. Lay out the hardwood strips on the floor as they will be installed, picking the straightest boards for the first two rows.
4. Secure the first row to the floor. For this you should face nail using #8 finishing nails or brad nails 1 1/2" long. **NOTE:** For face nailing, drill pilot holes at least 1" from the grooved side and 3" from the ends of the strip. The holes should be spaced at between 10" and 12" apart and the nails driven using a claw hammer and a nail punch with the holes eventually filled using matching the wood putty.
5. For blind nailing the second and third rows of strips, holes will be drilled into the tongue at a 45 degree angle at least 3" from both ends and spaced as above (**see Image 2**). Once again, the nails are driven using a claw hammer and a nail punch.
6. Use a strip which is at least 6" longer than required in order to finish off the first row. The remainder which was trimmed off the end will be used to start the next row. Make sure that the end joints do not line up with end joints of adjacent strips (**see Image 3**). Once this piece is cut, position the two pieces into place and secure them as above. Then position the strips needed for the second row being careful that the end joints are at least 6" apart from those in the first row. Fasten as per the description above for face nailing.
7. The next step is to rack your floor. Loose-lay the boards, starting about 3" away from the secured row. Try to distribute the long and short pieces while insuring that no end joints are within 6" of each other to avoid getting a cluster of end joints in one area (**see Image 3**). Boards should also be arranged based on the natural colour variations of the species to create a random appearance. Install the rest of the floor using your hardwood flooring nailer.
8. The last two rows against the finishing wall will be face nailed (**see Image 1**). Don't forget to fill all nail holes with matching wood filler. Also, note that holes are less visible in the darker grain of the wood. Use of stain, wax, filler or putty for defect correction is accepted as normal procedure.
9. Baseboards and quarter-rounds should be nailed to the wall only and never through the hardwood strips or into the sub floor (**see Image 1**). When you're done, clean the floor as is described in the Care & Maintenance instructions.

GLUE DOWN INSTALLATION

(SUPERIOR ENGINEERED FLOORING & ENHANCED HARDWOOD FLOORING)

Use only moisture-cured urethane or rubber adhesive. Check and follow the manufacturer's recommendations for trowel size, and spread rate to ensure adhesive transfer to substrate and hardwood. Be sure to also check adhesive expiration date. Conduct a moisture test on concrete (refer to the concrete paragraph on the next page). Test a small amount of adhesive on the concrete to ensure adhesion bonding. Be sure to use a metal trowel as the teeth in a plastic trowel will wear down and cause a difference in spreading rate. This will directly affect the hardwood's ability to adhere to the substrate. We recommend a "double glue" application. Using this method, the membrane will be glued to the subfloor, and the flooring glued to the membrane. This will give the best acoustic and stability performance. When flooring is glued directly on the subfloor it is called "simple glued". While simple glue systems work, they don't have the same acoustic ratings and stability as double glue systems.

PREPARATION INSTRUCTIONS

- 1) Remove baseboards, quarter rounds, and then screw off wood sub floors securely to avoid squeaking if necessary. The sub-floor must be clean, dry, smooth and flat.
- 2) Bostik's Best, BST, Franklin 811, or Acoustitech AD-316 AD-532 adhesives for engineered products work well following their installation guidelines for 1/2" (13mm) and 3/4" (19mm) engineered products. Check with the adhesive manufacturer for applications used with radiant floor systems. Be sure to follow the manufacturer's installation instructions.

INSTALLATION INSTRUCTIONS

- 1) Start on your longest and straightest wall. Measure the width of the board. Add the thickness of the boards for your expansion gap. (example: 5" board + 3/4" thickness = 5 3/4") Snap a chalk line on the sub-floor this distance out from the wall.
- 2) Spread out the adhesive on the subfloor. Make sure you don't apply more than you can install flooring on before the adhesive sets up. The freshly applied adhesive must leave trowel marks/trowel ridges. Only apply adhesive up to your chalk line and not over it.
- 3) Ensure you mix in boards with varied color, grain, and length. This can be accomplished by setting out 3 to 4 boxes of flooring at a time. Place the planks into the wet adhesive with the groove side on the chalk line and facing the outside wall. This is the same direction to that of a nailed/stapled down installation. Ensure that the 1st row is exactly on the chalk line.
- 4) Cut off the last piece in your starting row, leaving the proper expansion space of 1/2" (13 mm) from the wall and use it as your 1st piece or starter board for the 2nd row. It is best to not use a piece under 6" (15 cm) as they tend to move out of position. Continue each row, engaging the groove into the tongue along the side 1st, then the end to be engaged 2nd. Try to distribute the long and short pieces while insuring that no end joints are within 6" of each other to avoid getting a cluster of end joints in one area (**see Image 3 on page 5**). If any adhesive contacts the face of planks, use adhesive remover before it dries.
- 5) The use of painters' tape or 3M Blue masking tape will help to keep your planks from moving out of position. Do not use any regular masking, duct, or electrical tapes as these products can leave a film on your new flooring. Apply tape 90 degrees to row direction with approximately a 15-16" (38 to 41 cm) long piece; or long enough for 3-4 rows wide. Lap over or curl up the tape at one end to allow for fast, easy removal. Place tape at 48" (1,20 m) apart or across the rows.

- 6) Finish the room by installing the rest of the flooring. The last board may need to be cut on your table saw. Remember to leave an expansion gap between the last row and the wall.
- 7) Give the adhesive time to setup by avoiding any traffic for 24 hours. If this is unavoidable, use a kneeler board to help distribute the weight and movement.
- 8) Clean up your trowel and hands using the adhesive remover.

FLOATING FLOOR INSTALLATION

(SUPERIOR ENGINEERED FLOORING & ENHANCED HARDWOOD FLOORING)

PREPARATION INSTRUCTIONS

- 1) Remove baseboards, quarter rounds, and then screw off wood sub floors securely to avoid squeaking if necessary. The sub-floor must be clean, dry, smooth and flat.
- 2) For the optimal stability and acoustic performance, we recommend you use vapor-barrier underlayment with a maximum thickness of 1/8" (3mm) and 20% minimum compression.

INSTALLATION INSTRUCTIONS

- 1) Roll out the underlayment the length of the room the same direction as the flooring, cut it so it touches the outside walls. Overlap the seams 3 - 5" or as recommended by the manufacturer. Tape the edges together (we recommend tuck tape).
- 2) Make sure that your starting wall is straight and perpendicular to the room. Leaving an expansion space between the walls and the flooring is imperative when doing a floating floor installation. Use a spacer or wedges against the starting wall to prevent the floor from shifting or moving during installation. (See next page for more information on expansion gaps)
- 3) Apply tongue & groove adhesive to the top of the tongue and the bottom of the groove as you install each board. If you experience glue squeeze out when you assemble the boards, simply wipe it off with a damp cloth. Check with the glue manufacturer for details.
- 4) Continue along installing the boards for the first row. When you come to the end of the row, cut off the board, leaving enough room for an expansion gap between the floor and the wall. Make sure your off-cut is at least 6" long so that you can use it to start the next row.
- 5) Be sure to glue both the tongue and groove on both the ends and the sides of each board as you install them.
- 6) Continue along with the next rows. If the off-cut from the previous row is too short, discard it and get a new piece. Use a tapping block to ensure that the boards are tightly joined. Never hit the groove side or the edge of the board as it may cause damage to the boards. The use of a tool called a board puller may help to get the end joints tight.
- 7) Try to distribute the long and short pieces while insuring that no end joints are within 6" of each other to avoid getting a cluster of end joints in one area **(see Image 3 on page 5)**.
- 8) Use a table saw to rip the last row to width. Remember to leave room for the expansion gap.
- 9) Inspect and clean your floor as you work. Clean up any glue squeeze out as soon as you can so that it doesn't leave any residue on the finish of your new floor.



SPECIAL CONSIDERATIONS FOR FLOATING INSTALLATION

It is imperative that your new floating floor not be fastened to any surface or submitted to any movement restrictions.

Expansion gaps play a fundamental role in the performance of a floating floor installation. They allow the flooring room to expand and contract freely in relation to changes in ambient humidity and prevent damage that can affect the aesthetics and structural integrity of the floor. When the room humidity varies strongly, cumulative expansion and contraction can become damaging for the aesthetics and durability of the floor.

Expansion gaps are standard for floating installations of engineered floors. The expansion gaps must be respected on all walls, columns, doorways, moulding, or any fixed elements. The use of spacers during installation insures that the appropriate expansion gaps will be used.

See reference table below.

REQUIRED EXPANSION GAP	MAXIMUM ROOM WIDTH	MAXIMUM ROOM LENGTH
1/2" (13 mm)	Up to 26' (8 m)	Up to 52' (16 m)
3/4" (19 mm)	Between 26' - 40' (8 to 12 m)	Between 52' - 80' (14 to 24 m)

NOTE: The installation of a t-moulding might be necessary for any room exceeding 40' in length or width. If necessary, drywall can be undercut to obtain expansion space.

CONCRETE

Concrete leveling is a very important point. Concrete must be flat/level within 3/16th over a 10 ft. span (< 5 mm over 3 m). For new concrete, allow a minimum of 30 days cure time prior to start of concrete moisture tests. Various methods and testing devices exist to check the moisture level of a concrete subfloor.

POLYETHYLENE TEST

Polyethylene test (Astm D 4263), surface test. Tape a plastic film of 2'x2' (60 x 60 cm) at several points over concrete for 48 hours to see if concrete changes color or condensation occurs. If beads of water are found on the subfloor or the concrete appears darker, further testing is necessary. If there is no indication of moisture under the polyfilm, the installation may proceed. This method is empirical and is a preliminary test, further analysis will be required. The reading is valid at 24 hours, but it's even better if the test can stay in place until 72 hours have passed.

RELATIVE MOISTURE TEST

Relative moisture test (Astm F 2170), thorough test. Using an ultrasonic sensor, check the relative humidity of the concrete slab to 40 % of its depth. A reading of 75 % RH or less indicates that the concrete slab is ready to receive the wooden floor; a reading between 75% and 85 % indicates that it is preferable to place a waterproof membrane before installing the wood floor. Never install a hardwood floor when moisture level is greater than 85%.

CALCIUM CHLORIDE TEST

Calcium chloride test (Astm F 1869), thorough test. The Calcium Chloride Test works by measuring changes in weight of anhydrous calcium chloride crystals. A small plastic dish of crystals is sealed with a plastic tape. The entire dish is weighed on a gram scale prior to exposure, and the weight, date and time the test was started must be recorded. The lid is then opened, and the dish of crystals is carefully set down on the concrete for 60 to 72 hours. The dish is

enclosed within a 7-by-10-inch cover, which is sealed to the concrete. During this time, the only source of moisture being absorbed by the crystals is what can evaporate out of the covered concrete surface area.

At the end of the test, the dome is removed and the lid is placed back on the dish and sealed. Again the dish is weighed on the gram scale and the date and time are marked. The change in weight is multiplied by a constant and divided by hours to provide an estimated rate of evaporation, in pounds (which is the equivalent weight of the water that evaporates out of a 1,000-square foot surface area during 24 hours). Water weighs 8.3 pounds per gallon. If the test reports 8.3 pounds emission, then one-gallon of water is leaving a 1,000-square foot surface area in 24 hours.

A conservative, but generally recommended, allowable amount of moisture emission as expressed by the calcium chloride test is 3.0 pounds per 1,000 square feet per 24 hours at the time of the installation of the flooring. A note of caution: Use care in dealing with the lid, removal of the dish, and weighing as exposure to the atmosphere will dramatically affect the results.

RADIANT HEAT INSTALLATIONS (ENGINEERED AND ENHANCED)

Refer to the Appendix A - Radiant Heat Compliance for information on radiant heat.

CARE & MAINTENANCE

FOLLOW THESE SIMPLE INSTRUCTIONS AND YOU WILL ENJOY YOUR HARDWOOD FLOOR FOR MANY YEARS.

- When necessary, regularly vacuum, sweep or dry-dust mop your floor as often as required to remove dust, soil or grit [sand and small stones] which can act like sandpaper and scratch your floor. Do not use a vacuum with a beater bar or power rotary brush head as it will scratch the wood. If your floor needs cleaning from time to time, spray a small amount of hardwood floor cleaner directly on the terry cloth mop head, not onto the floor. Use a back and forth motion with the mop in the direction of the length of the floor boards to prevent streaking. Never wax the floor.
- Never clean your floor with water or any cleaner that must be mixed with water as this will void the warranty. Wipe up soil and spills promptly using the cleaner and a clean cloth. Water and wood do not mix. Water can and will cause damage to the finish and integral structure of wood flooring. Steam Cleaners contain water, and should not be used.
- Do not place potted plants directly in contact with hardwood floors.

Water and wood do not mix. Water can and will cause damage to the finish and integral structure of the wood floor

- Floor mats at entrance ways and on all high traffic areas will keep soil and moisture from being tracked on your floor. Use of high quality mats and rugs will prevent damage to or discoloration of the floor. Note however, that when mats and rugs are placed directly onto hardwood flooring, they will abrade the flooring they move around when they are walked on. As dirt and sand build up under the rug the constant movement of the rug will grind those small particles into the wood finish. They also pose an obvious slip, trip and



fall hazard in the household. Only those mats with proper gripping backs should be used where elderly or infirm occupants will walk over the area in question. For rugs that do not have a gripping back, rug pads work well to protect your floor and keep rugs from moving around.

- Attach felt pads to all furniture and objects that will rest on your floor. This will help to prevent scratches and make your furniture easier to move when you want to clean your floor.
- Over time, exposure to sunlight will bring about minor changes in color to the hardwood floor. This colour change is caused by oxidation of the wood fibres, and is not considered a defect. Move your rugs occasionally to avoid uneven colour of your wood flooring due to strong UV light.
- Use protection like a blanket, towel, or carpet face-down underneath all furniture or appliances to be moved to avoid scratching and permanently denting the floor.
- Replace narrow hard chair rollers with wide non-marking rubber rollers.
- Never allow persons wearing spiked high heel shoes to walk on hardwood flooring.

MAINTAINING THE CORRECT HUMIDITY LEVEL IN YOUR HOME (35-50% FOR SOLID AND 30-65% FOR ENGINEERED)

IMPORTANT CUPPING AND GAPPING INFORMATION AND RELATIVE HUMIDITY INFORMATION

Relative Humidity or RH is the ratio of the actual amount of water vapour contained in the air at a given temperature to the maximum amount of water vapour that the air at that same temperature can hold, expressed as a percentage.

Wood is a hygroscopic material and always contains water. It constantly exchanges water vapour with the air, picking it up when relative humidity is high, and giving it off when relative humidity is low. Since wood swells as it absorbs water, and shrinks as it releases water, both its moisture content and its dimensions are controlled by the relative humidity of the surrounding air. Wood moisture content is equal to the weight of water contained in the wood divided by the oven dry weight of the wood, expressed as a percent.

Inside homes however, where the relative humidity of outdoor air is drawn inside and drastically altered by heating it and cooling it without humidification or dehumidification, wide seasonal swings in relative humidity will cause wood moisture content and dimensional changes to occur. Since warm air can hold more water vapour than cold air, the relative humidity of air with a certain absolute humidity can be changed by simply changing its temperature. If in winter, for example, outside air is at 20°F and 65% RH is drawn inside and warmed to 70°F without humidification, its relative humidity drops to about 10%. In summer, outside air at 70°F and 60% RH that flows into a basement at 60°F will end up at 82% RH.

To minimize this movement, the relative humidity must be maintained between 30 - 65% for Superior Engineered Flooring & Enhanced Hardwood Flooring products, and 35 - 50% for Superior Solid.



EFFECTS OF EXCESSIVE OR INSUFFICIENT MOISTURE ON SOLID HARDWOOD

Moisture or lack of it is hardwood's worst enemy. Solid hardwood flooring will perform well if relative humidity is maintained within the recommended range as shown in **Chart 2**.

Low relative humidity: Solid hardwood flooring installed in a house with low humidity will start to show gaps between the boards. This is strictly a cosmetic issue and does not affect the structural integrity of the product. When the humidity returns to its recommended range, these gaps should start to disappear. If the gapping is extreme because the humidity was way below the recommended range, this will take more time to correct itself.

High relative humidity: If the humidity is too high in the house, the most common issue with solid hardwood floors is cupping. This damage can be either temporary (seasonal) or permanent depending on its extremity and the duration of the time it was exposed to high moisture. During this time of high humidity, the floor boards will expand. This expansion can exasperate the gapping during the winter months as the boards will not move back to their original location once they have been forced to move.

EFFECTS OF EXCESSIVE OR INSUFFICIENT MOISTURE ON ENGINEERED HARDWOOD

Although Engineered Flooring is much more stable than solid hardwood, it will still react to changes in relative humidity according to the season. Engineered flooring should be maintained within the recommended range on Chart 2. If the relative humidity is too low the flooring will start to dry cup and/or crack in winter months.

Low relative humidity: If the relative humidity is below 30% for a prolonged period, the face lamella will start to contract. This can cause what is called dry cupping and is considered normal when relative humidity is too low. The floor should return to its normal state once the relative humidity is back to normal (30-65%). If the relative humidity drops below 20%, the construction of Superior Engineered Flooring and Enhanced Hardwood Flooring is such that the core material will minimize the face lamella's contraction. If the lamella is under too much stress, and the core is not allowing the face to move (minimize cupping) the face lamella has no other choice but to relieve its pressure by stress cracking. Stress cracking is NOT covered under this warranty.

High relative humidity: In engineered hardwood, if the relative humidity is too high, the flooring will start to crown. Once the relative humidity goes back to within the specified range, it can should settle down and return to its' original state.

These variations can be minimized with proper ventilation, humidification or heating. You may need to improve your humidification and/or dehumidification system in order to maintain the required humidity levels.

APPENDIX "A" RADIANT HEAT COMPLIANCE RADIANT HEAT INSTALLATIONS (SUPERIOR ENGINEERED FLOORING & ENHANCED HARDWOOD FLOORING)

NOTE: This warranty validation process must be completed and signed by both the installer and the homeowner before any product is shipped. This warranty validation process works alongside our Herwynen Sawmill Limited Lifetime Warranty.

Once both the homeowner and installer have completed and signed the Radiant Heat Compliance Form, send a copy of this form along with the original order

confirmation back to Herwynen Sawmill Ltd. We will assign this form a number, and keep it on file for our records. Should a problem occur, this form will be used for reference. Herwynen Sawmill Ltd. will only warranty certain widths and species of flooring over radiant heat. Please see **Table 2** for products that are acceptable on radiant heat.

With a good understanding of how engineered flooring will react to radiant heating systems, you can install this product and have it last a lifetime.

GENERAL RADIANT HEAT GUIDELINES

As radiant heat is a dry heat, and the heat source is directly below the flooring, it has the potential to dry out much faster than with a conventional heating system. To counteract this, the humidity level in your house will need to be monitored and maintained at 30% relative humidity or above.

Radiant heat systems should be turned on and the temperature increased over an approximate 10 to 14-day period.

Regardless of whether the system is new or pre-existing, NEVER allow the radiant heat systems temperature to change up or down by more than 2° Fahrenheit per day. During the cold season when radiant heating is working at full power, humidity levels can get very low causing the wood to dry out and cause cracking or splitting. To avoid this type of damage to your flooring, it is imperative that the relative humidity in your house remain between 30% and 65%. To ensure humidity levels remain within the recommended range the installation of room humidifiers or a whole house system is strongly advised.

Rapid changes in temperature affect the moisture content of your hardwood floor. To minimize this, Superior Flooring recommends the installation of an outside thermostat. Unlike conventional heating systems which switch on when required, radiant heat systems work most effectively and with less trauma to the hardwood floor if the heating process is gradual and based on small incremental increases in relation to the outside temperature.

When using radiant heat, cranking the heat up above the maximum temperature will result in cracking and warping of the floor. Note that raising the heat above the maximum temperature suggested by Superior Flooring will automatically void your warranty.

SURFACE TEMPERATURE INDICATING STRIPS

Surface temperature indicating strips are used to ensure that the temperature of the floor does not exceed the temperature recommended by Herwynen Sawmill Ltd. These indicating strips contain crystals that change color when the temperature exceeds a specific temperature. These sensors must be shipped with ice packs, in a sealed and insulated container. If the surface temperature of the subfloor exceeds 81 °F (27 °C) or the temperature of the boiler output exceeds 129 °F (54 °C), these sensors will turn black. This colour change cannot be reversed.

1 Surface Temperature Indicating strip must be placed on the main output tube of the boiler in your home.

1 Surface Temperature Indicating Strip must be used for every 300 square feet of flooring installed, with a minimum of one strip per room. One of these strips must be placed above the location where the heat tube enters the room.

Installation of these sensors is mandatory for your warranty to be valid. These sensors are cheap, and can be purchased through authorized Superior Flooring dealers.

Herwynen Sawmill Ltd. requires that drawings be made by the installer to indicate the location of the Indicating Strips in each room of the house. These drawing must be submitted to both the home owner and Herwynen Sawmill Ltd.



SUBFLOOR MOISTURE TESTING

Subfloors should have proper moisture tests according to the moisture testing procedures outlined in the Radiant Heat Compliance Form. Whether your radiant heating system is made of concrete, wood, or a combination of both, one the most important things to remember when installing wood flooring is to avoid penetrating the heating element. You will need to alter your installation methods depending on the type of subfloor used. Always test concrete in accordance with the Radiant Heat Compliance Form. With water-heated radiant-heat systems, a pressure test must be performed and documented by a qualified plumber or the system installer prior to beginning the installation of the wood flooring. Electric under floor systems should also be tested prior to floor installation. Check heat system manufacturer guidelines. If flooring materials that conduct heat at different rates are on the same circuit or heating zone, check with the HVAC mechanical engineer and Radiant Panel Association before proceeding.

PREPARING THE CONCRETE SUBFLOOR

For Existing Concrete: If your concrete floor is pre-existing (not recently poured) in your house but the radiant heat has not been used in the last 60 days, Superior Flooring requires that the radiant heat be turned on for at least 120 hours to get any existing moisture out of the concrete. This needs to be done regardless of season and after the concrete has cured. With some installation systems, and particularly with glue-down applications, you may be required to turn the heat down, or even off to avoid excessive curing of the glue. After this initial run, you are then required to have the heat turned off for at least 48 hours before any flooring is installed. Conditioning your concrete in this manner prepares it for accepting your engineered flooring. Remember to work through these heating and cooling cycles gradually as it will help your concrete slab to adjust consistently. Not conditioning your concrete sub-floor will automatically void your Herwynen Sawmill Limited Lifetime Warranty.

For New Concrete: If the concrete in your house is less than 60 days old, you must run your radiant heat system for at least 45 days before installing Engineered Flooring. By allowing moisture to evaporate from your floor for this 45 day period, you are giving the concrete time to stabilize. Once your concrete has stabilized, your Engineered Flooring will be able to be installed without risk of it picking up any residual moisture. Perform a calcium chloride or polyfilm test to determine the moisture content of your concrete. If your concrete passes the test, you are then required to have the heat turned off for at least 48 hours before any flooring is installed. Conditioning your concrete in this manner prepares it for accepting your Engineered Flooring. Remember to work through these heating and cooling cycles gradually as it will help your concrete slab to adjust consistently. Not conditioning your concrete sub-floor will automatically void your Herwynen Sawmill Limited Lifetime Warranty.

Refer to the concrete testing section for information on the accepted methods.



MAXIMUM TEMPERATURES	
Maximum Tube Temperature out of Boiler	129°F (54°C)
Maximum Subfloor Temperature	81°F (27°C)

TABLE 1

APPROVED RADIANT HEAT SPECIES & SIZES	
Maple 3 1/4", 5", 5 3/16"	YES
Maple 7"	NO
Hickory 5", 5 3/16"	YES
Hickory 7"	NO
White Oak 5", 5 3/16", 6", 7"	YES
Red Oak 3 1/4", 5 3/16"	YES
Walnut 5", 7"	YES
Ash 5 3/16"	YES

TABLE 2