HALLMARK FLOORS®
HARDWOOD FLOORING

INSTALLATION INSTRUCTIONS
DESIGN EMPORIUM - HERRINGBONE

TrueMark®
Glaze Tek Poly Finish

Attention
Before starting installation, read all instructions thoroughly. Should any questions arise, please get in touch with your dealer/retailer.

Owner/Installer Responsibility

1. Inspect the hardwood flooring in well-lit conditions to ensure proper identification of any potential problems. Carefully inspect the flooring for grade, color, finish, and quality. If the flooring is unacceptable, contact the local retailer and/or distributor to arrange shipment of replacement material. The defective product will be replaced. Material that is subjectively viewed as unacceptable but falls within grading norms will not be replaced.

IF THE FLOORING AS SUPPLIED WILL NOT SATISFY THE CUSTOMER IN FULL, DO NOT PROCEED TO INSTALL. The decision not to proceed must be made within the first 10% or 100 square feet of flooring boxes opened, whichever is less. Open boxes exceeding this amount will not be eligible for return.

2. Prior to installation of any flooring, the installer must ensure the job site and sub-floor conditions meet the requirements specified in these instructions.

3. Hardwood flooring installation should be one of the last items completed on the construction project. Limit foot traffic on the finished wood floor.

Grading Standards
General Rules:
Flooring shall be tongue and grooved and end-matched (unless otherwise indicated). Flooring shall not be considered of standard grade unless properly dried. The drying standard for the product shall be 8 to 10% moisture content by volume with a plus or minus factor of 2% for storage conditions in various climate zones.

Grading Rules:
Like many flooring and lumber mills, we use a proprietary grade for manufacturing our floors. Proprietary grades are generally referred to as Mill Run. Instead of separating the lumber into traditional NOFMA/NWFA grades

Environmental Issues
Damage caused by inappropriate handling, environment, installation, or maintenance issues will not be considered in relation to grade. NOTE: DO NOT OPEN BOXES PRIOR TO INSTALLATION. Boxes are to remain completely closed until the time of installation.

Storage and Handling
Handle and unload wood flooring with care. Store in a dry place; Make sure to provide at least a four-inch space (using dry 4" x 4" stickers or a dry pallet that provides enough clearance under boxes for proper air movement. Prior to the delivery of flooring, outside doors and windows must be in place. All concrete, masonry, plastering, and other "wet" work must be complete and thoroughly dry prior to flooring installation. The roofing and the exterior shell of the structure must be finished and weather tight with doors and windows installed.

The wall coverings should be in place, and all painting completed–except for the final coat on the base molding. Room temperature and humidity should be consistent with year-round conditions for at least one week prior to installation. When possible, install base molding after the floor installation is complete.

HVAC MUST BE RUNNING WITH A ROOM TEMPERATURE OF BETWEEN 60°F TO 80°F AND RELATIVE HUMIDITY OF BETWEEN 30 AND 55%.

Acclimation & Climate Control
Wood flooring is a hygroscopic material subject to dimensional change as a result of variations in moisture, temperature, and humidity within the surrounding environment. Wood flooring simply needs to reach a moisture content level in equilibrium with the surrounding environment (EMC) IN WHICH IT WILL BE INSTALLED AT OR NEAR NORMAL LIVING CONDITIONS

(Defined as between 30 –55% RH 60 to 80° F - Hickories to be maintained at 35-55%). The process of reaching this equilibrium is defined as acclimation, which allows the wood to properly

adjust itself to the normal living conditions within the structure; that is, the temperature, humidity conditions, and moisture content that will typically be experienced once the structure is occupied and stable indoor climate control is exercised.

NOTE: Intended for indoor use only.

NORMAL ENVIRONMENTAL CONDITIONS MUST BE MET TO ENSURE OPTIMAL PERFORMANCE.

At manufacturing, flooring is dried to a content of between 8–10% EMC (equalized moisture content). EMC to be maintained at a relative humidity environment ranging from 30%-55%, and 60 to 80° F.

Heating and ventilating systems must be designed and working to maintain both, an interior relative humidity level between 30% and 55%, and a temperature between 60 and 80°F year-round.

Wood Reactions to Environmental Change
Low RH
Wood shrinks and splits. Joints become loose, and the elements no longer fit together tightly. Veneers and inlays suffer- If the underlying carcass wood shrinks, cracks will appear in the veneer and inlays become loose. When the glues holding them down fail, veneers lift. Causes finishes to shrink, craze and flake.

High RH
Swelling can cause moving parts such as cabinet doors or drawers to jam. If glue fails, veneer peels away. Corrosion affects nails holding things in place, metal inlay, and fillings. Insects and rot may flourish as the content of the wood rises, fast and constant cycling of RH fluctuations causes the most damage for all of the above to create rapid structural weakening.

The Role of HVAC
Low Indoor Humidity: This is generally experienced in areas that are very cold in the winter or very hot in the summer. In cold areas, the indoor air is heated, and the moisture goes up the vent pipe, depriving wood objects of the humidity required for a healthy moisture content. Whole house humidification systems are the most efficient way to prevent dry wood damage to floors, cabinets, musical instruments, doors, molding & millwork. The addition of moisture will make the heating system far more efficient as well.

High Indoor Humidity: Is generally seen in the summertime in many areas of the country where outdoor relative humidity gets very high. Air conditioning as a whole will remove a great deal of humidity from indoor air. However, this works the air conditioning unit very hard and in most areas air conditioning levels are set in the 60's to remove enough moisture for the room to be comfortable. Dehumidifiers can be added to the HVAC system to take much of the strain off an air conditioning unit. Dehumidifiers are much less expensive than air conditioners, and dehumidifiers can make the air conditioner last longer and be far more energy efficient.

Homeowners need to be aware of the vital role that relative humidity plays in wood performance. Not just flooring but anything made of wood found in a home, including the structure itself.

CLIMATE CONTROL
If heating and/or air conditioning with proper humidity controls are in operating condition, they need to be turned on. If it is not possible for the permanent system to operate, a temporary system that provides proper temperature and humidity conditions must be in place and remain in place until permanent climate control is operational.

INSTALL FLOORING LAST
Hardwood floor should be the last trade in the house (before base boards are installed). All concrete, masonry, plastering/drywall, texturing, and painting/ primer coats should be completed beforehand. Covering the floor while wet trades are in the house can lead to moisture condensation on the protective paper. Moisture can pull into the paper or be trapped under the surface of materials that cover the floor. Paper coverings also allow dents and scratching to occur. Coverings held in place by blue tape for more than 24 hours can damage the floor. The adhesive in tapes contains

Phthalates /plasticizers that can penetrate floor finishes and bond with the finish at the molecular level, presenting a risk of pulling/ damaging the finish when the tape is removed. We recommend that built in cabinets and built in furniture be installed before installation of the floor. This prevents damage to the flooring and makes any potential flooring repairs that may be required at a later date simpler to perform.

Floors are most often installed too early, without climate control, and other wet trades are present in the home. Paper and cardboard often absorb moisture, further damaging the finish.

Exterior Checks

1. Proper drainage away from the structure is absolutely critical to ensure weather-tight conditions and is crucial to proper hardwood flooring performance. If the structure is near a hill, the lot should be graded with a swale to move moisture off the lot and prevent it from coming in contact with the foundation.

2. Is exterior soil elevation 6” below edge of flashing?

3. Is exterior hardscape (concrete, wood decks, pavers) elevation at least 2 ½” lower than the edge of flashing and door thresholds?

4. Does exterior slope away from foundation at a rate of 6” drop in 10’ for soft landscaped areas and 3” drop in 10’ for hard-paved areas?

5. Rain gutters must be in place to carry moisture away from the house. French drains are recommended, and basement walls should be adequately sealed.

Basement Moisture & Humidity Control

Basements should be completely weather-tight and have proper drainage away from the foundation walls in place to ensure that the basement remains dry.

1. Basement should be free of all moisture and be weather tight.

2. The relative humidity of basements should not be more than 10% higher than the upper floors.

3. Humidity control of the basement is vital to help control mold and prevent damage to the structure and hardwood flooring.

4. Basement walls should be inspected for cracks and excessive moisture content.

5. Drains must be placed at basement windows.

6. Direct sprinklers and irrigation systems away from the foundation. Sprinklers spraying the foundation edge can lead to moisture intrusion into the structure. Drip irrigation systems for plant beds are recommended.

Crawl Space Ventilation

Crawl space earth (or thin concrete slab) should be covered 100% by a vapor retarder of black polyethylene (minimum 6 mil) or any recommended puncture-resistant membrane, such as Class C meeting ASTM D1745. Check local codes or any additional requirements.

Size of available vents should equal to 1.5% of the square footage within the crawl space. Relative humidity should be consistent with the interior of home.

Moisture content of subfloor should not vary more than a 2% MC from the top of the subfloor to the bottom.

Installing temperature/humidity-activated exhaust fans may be necessary to create more air movement in the crawl space. Uncontrolled humidity and moisture in the crawl space will lead to mold and damage to the structure and the hardwood floor. In these events, a contractor specializing in dehumidifying systems will need to be contracted to keep the crawlspace humidity within proper norms. This is more likely in high-humidity areas.

NOTE: Completely sealed crawlspaces (no exterior cross-ventilation) require a dehumidification system as part of the sealed crawlspace design.

Subfloor Moisture Testing
CONCRETE
Since wood flooring is incompatible with wet conditions, We do not warrant against moisture-related issues or related damage under warranty. This is an industry-standard, and manufacturers do not offer moisture warranties. However, moisture warranties are offered by various adhesive manufacturers.

NOTE: Due to the porous nature of concrete, vapor emissions are subject to change over the lifetime of the installed floor. Slab moisture emissions are a common cause of damage to hardwood floors. Due to the potential for concrete moisture emissions to increase/decrease over time and the absence of moisture warranties for wood flooring, choosing an adhesive system that includes moisture abatement properties is prudent.

Adhesive manufacturers offer moisture warranties for moisture abatement systems that will be conditional. Follow their directions closely to ensure compliance and full warranty coverage. Proper spread rate and coverage are very important.

Use proper trowel size and replace trowels at the recommended square footage intervals the adhesive manufacturer requires to ensure proper application thickness.

NOTE: Some adhesive manufacturers offer adhesive/moisture abatement systems that do not require pre-installation testing of the slab to maintain a moisture warranty. Check with adhesive manufacturer to confirm which products they offer, that allow installation without pre-checking/testing the slab.

ADDITIONAL NOTE: We make no guarantees regarding the performance of any adhesive/vapor abatement system.

The installer is fully responsible for proper installation, and the moisture warranties are the responsibility of the manufacturer of the adhesive moisture abatement system.

NWFA Moisture Testing Standards
The NWFA (Industry standard) uses the following test methods to determine optimal conditions for the installation and performance of a hardwood floor. Follow adhesive manufacture's specifications for testing of concrete subfloor. Some adhesive manufacturers offer systems that create a vapor barrier to protect the wood flooring from moisture emissions coming up through the slab. Many adhesive manufacturers require the tests listed below to be performed prior to installation of the floor. Carefully read and follow the adhesive manufacturer's instructions.

CALCIUM CHLORIDE: ASTM F1869
Under ideal conditions, the slab should not emit more than 3 lbs. per 1,000 square feet per 24-hour period Carefully follow the instructions in the test kit to ensure that you get accurate results.
NOTE: The slab emissions can vary based on soil humidity and room temperature. Consult the adhesive manufacturer's directions for the moisture abatement system they recommend.

HUMIDITY PROBE & DIGITAL METER: ASTM F2170
Widely used in Europe, this test determines the amount of humidity in the slab. This is an effective way to determine a slab's potential for emitting moisture.
Follow all meter manufacturer's guidelines for performing testing. Under ideal conditions, the slab readings should be 75% RH.

CAUTION: Post Tension Slabs require special care to avoid cutting cables in slab. Cutting post-tension cables can cause serious structural damage and potential fatalities.

New concrete slabs require a minimum of 60 days of drying time before covering them with a wood floor. The slab must be fully cured. Slab must be comprised of Portland-based mix with a minimum of 2,500 PSI of compressive strength.

Adhesive Clean Up & Effects on Surface Finishes

Moisture Curing Polyurethane Adhesives: Are problematic for Oil Finished Floors. Moisture Curing Urethanes requires heavy solvent cleaners to remove adhesive residue from the floor's

surface. These solvents strip the oil and make the floor vulnerable to stains.

Additionally, Moisture Curing Polyurethane Adhesives can also cause problems for UV cured polyurethane finishes. When allowed to dry the adhesive cures to the top of the floor finish leaving smudges on the floor. When attempting to remove urethane glues that have cured to the surface, removal attempts leave shiny or dull spots in the finish. This then requires a pad and recoat to repair the damage.

MS Polymer Adhesives

Many MS Polymer adhesives provide moisture abatement capabilities. To avoid damage to the finish from urethane adhesives. We recommend MS Polymer adhesive systems with vapor abatement capabilities and moisture abatement warranties.

Contact Local Distributor for recommendations on MS Polymer adhesives.

Subfloor Preparation CONCRETE
For glue-down application over gypsum or lightweight concrete, the same 2,500 PSI minimum rating is required.

Note: Some adhesive systems have primers and adhesives that are suitable for use over gypcrete or lightweight concrete and may have different PSI compressive strength requirements.

Adhesive manufacturers are responsible for their systems' performance over gypcrete or lightweight concrete.

Remove all paint, oil, existing adhesives, wax, grease, dirt, sealers, and curing compounds. Do not use solvent-based strippers under any circumstances, as residual solvents can prevent the satisfactory bonding of the vapor barrier and adhesive systems. It is important to ensure a long-lasting bond between the adhesive, the concrete, and the boards.

FOLLOW ALL ADHESIVE APPLICATION INSTRUCTIONS.
Industry standard practice is to use a sanding system with 20 grit # 3½ open face paper to remove loose, flaky concrete. For heavy surface contamination, it may be necessary to bead blast the concrete surface.

NOTE: Adhesive manufacturers generally recommend prep fillers and patches to repair concrete substrates that are compatible with the adhesive system to be used. Make sure you use the prep products that are recommended by the adhesive manufacturer.

Subfloor tolerance for a flat surface is 3/16" within a 10' radius and 1/8" in a 6' radius. These are industry standards established by NWFA. Use a straight edge to determine if the subfloor requires grinding or filling.

NOTE: A quarter is approximately 1/16" thick and can be used as a thickness gauge. Grind high spots and fill low spots with the adhesive manufacturer's recommended filler.
REMINDER: Use the filler recommended by the adhesive manufacturer.

California Prop 65 Warning
Drilling, cutting, and grinding of concrete generates concrete dust containing crystalline silica, a substance known to the State of California to cause cancer, birth defects, or other reproductive harm. Avoid inhaling concrete dust by wearing a dust mask or other safeguards for personal protection. CA HEALTH AND SAFETY CODE 14808-60-7: Wear an appropriate NIOSH designated dust mask to reduce risk of dust inhalation. Wear proper eye protection and avoid prolonged contact with eyes and skin. In the event of eye irritation, flush with water for 15 minutes and seek medical attention!

CAUTION: ASBESTOS
State and Federal agencies have determined that asbestos is a respiratory carcinogen. Avoid sanding or scraping of old vinyl, linoleum and VCT as they may contain asbestos. Take proper precautions and contact an asbestos abatement company to remove any old vinyl or vinyl tile floors containing asbestos. Cut-back adhesive and other types of

adhesives can also contain asbestos.

Clean the Subfloor.
After completing all prep work, sweep and/or vacuum the subfloor. Dust and dirt can affect the adhesive or vapor barrier's ability to adhere to the slab.

Installing over Existing Floor Coverings on Concrete
Perimeter-glued resilient vinyl, VCT and rubber tiles are not acceptable underlayment's and must be removed. Terrazzo, tile, and full spread glue-down vinyl's that are dry, structurally sound, and level (as described above) may be suitable as a subfloor for installation.

See the adhesive manufacturer's guidelines. We are not responsible for the performance or suitability of existing flooring products that are not removed from concrete.

As indicated above, the surface must be sound, tight, and free of paint, oil, existing adhesives, wax, grease, and dirt.

Terrazzo and ceramic tile must be sufficiently scuffed to ensure adhesion. Portland-based products must be used to comply with flatness requirements of 3/16" in a 10' radius or 1/8" in a 6' radius. See the adhesive manufacturer's guidelines.

Existing vinyl, tile, or terrazzo are not considered vapor barriers and can still transmit unacceptable moisture levels to hardwood flooring. Existing hardwood flooring must be removed prior to the installation of a new wood floor on concrete.

Subfloor Moisture Testing WOOD
Probe-type (pin) meters are considered the best method of testing. Remember: The top and bottom of the subfloor should vary by no more than 2%. Wood substrates must have a moisture reading of no more than 12% when using Lignomat, Tramex, Delmhorst, or equivalent moisture meter and be within 4% of the moisture content of the flooring to be installed.

Subfloor Preparation WOOD
Wood subfloors need to be well nailed or secured with screws. Nails should be ring shanks, and screws must be counter-sunk. The wood subfloor must be structurally sound (i.e. without loose boards, vinyl, or tiles).

Subfloor tolerance for a flat surface is 3/16" within a 10' radius and 1/8" in a 6' radius. These are industry standards established by NWFA.

Engineered subfloor panels must be ANSI-rated plywood, OSB (oriented strand board) of specified thickness to meet joist spacing specifications listed below, or sound solid lumber subfloor that is a minimum of 3/4" thick and dry.

1. For panel products subflooring, check for loose panels and re-nail or screw down loose panels securely. Nails and screws must be countersunk.

2. Ensure proper expansion space (1/8") between the panels. If panels are not tongue and groove and do not have sufficient expansion space, it may be necessary to use a circular saw to create the specified space. Do not saw through joints on tongue and groove subfloors.

3. Check for delamination or damaged areas to subfloor and repair those areas as needed.

4. Make sure the subfloor is free of debris before beginning installation.

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

Truss/Joist Spacing
a. Truss/joist spacing of 16" (406cm) o/c or less, the industry standard for single panel subflooring is a minimum of 5/8" (19/32", 15.1mm) CD Exposure 1 plywood subfloor panels or 23/32" OSB Exposure 1 subfloor panels, 4' x 8' panels.

b. Truss/joist spacing of more than 16", up to 19.2" (488mm) o/c, the standard is a minimum ¾" (23/32", 18.3mm) tongue and groove CD

Exposure 1 Plywood 4' x 8' sheets glued and mechanically fastened or ¾" (23/32", 18.3mm) tongue and groove OSB Exposure 1 subfloor panels, 4' x 8' sheets glued and mechanically fastened.

c. Truss/joist spacing of more than 19.2" (488mm) o/c up to a maximum of 24" (610mm) requires a minimum 7/8" tongue and groove CD Exposure 1 plywood subfloor panels, 4' x 8' sheets, glued and mechanically fastened, or nominal 1" OSB Exposure 1 subfloor panels glued and mechanically fastened–or two layers of subflooring.

NOTE: Subfloor deflection is the number one cause of squeaking in nail-down floors. If subfloor deflection exists corrective measures must be taken to correct it, even if the subfloor thickness meets industry specifications for thickness of subfloor in relation to joist spacing!

JOIST CROSS-BRACING

A subfloor that is not thick enough to support the span of the joists will cause unacceptable subfloor deflection. An alternative to adding additional plywood on top of the subfloor would be to cross-brace between the joists. The cross-bracing would be done at the appropriate distance on center to meet specification and bring the deflection within proper tolerance. Check with the joist or truss manufacturer to determine if cross-bracing is allowed with that system. Should it not be compatible with the joist or truss manufacturer, sheeting the subfloor with a second layer of CD or better-grade plywood would be the only option. (See double layer subfloors section).

DIRECTION OF INSTALLATION IN RELATION TO JOIST POSITION.

The best application is at a 90° angle across the joists. This provides for the best stability of the floor. Alternatively, the floor can be installed at a 45°angle to the joists. The floor cannot be installed in the same direction as the joists without installing an additional sheet of plywood on top of the existing wood subfloor. Installing the same direction as the joists without reinforcing the subfloor is common cause of squeaking in a nail down floor.

When installing the flooring in the same direction of the joists, a second layer of plywood is required to stiffen subfloor. The subfloor must be sheeted with ½" (15/32", 14mm) CD exposure 1 plywood subfloor panels. Use the same method as attaching to solid board subflooring.

SHEETING EXISTING SUBFLOORS
SOLID BOARD SUBFLOORING

Solid Board Subflooring should be ¾" x 5 ½" (1" x 6") group 1 dense softwoods (SYP, Doug Fir, Larch, etc.), #2 common, kiln dried. Solid board subflooring should consist of boards no wider than 6", installed on a 45° angle, with all board ends full bearing on the joists and fastened with a minimum 8d rosin-coated or ring-shanked nails or equivalent. Solid board subflooring that is uneven at the edges should be repaired and sheeted with ½" (15/32", 14mm) CD exposure 1 plywood subfloor panels, 4' x 8' sheets, and should be installed running cross-truss/joist. Glue top and bottom layer together with construction adhesive and screwing into the truss/ joist system every twelve inches.

Additionally, nail (ring shank) or staple layers together on a minimum 12" grid pattern. Sheets should be glued to lumber subfloor using good quality construction adhesive and screwed to joists. The sheeting must be nailed or stapled to the sheeting.

When the subfloor **does not** meet thickness standards for span between joists, a second layer of plywood is required to stiffen subfloor. See item C of the previous section.

The minimum second layer should consist of nominal ½" (15/32", 11.9mm) CD exposure 1 plywood subfloor panels, 4' x 8' sheets, depending on how much deflection correction between joists is necessary. A thicker layer may be required to offset joist spacing.

The top layer of plywood should be offset by 2' from joints in first layer of subfloor and installed in the opposite direction to the bottom subfloor panels. Glue top and bottom layer together with

construction adhesive (specified as suitable for this use) and screwing into the truss/ joist system every twelve inches. Additionally, nail (ring shank) or staple layers together on a minimum 12" grid pattern.

GENERAL INFORMATION: No fiberboard or particle board is acceptable for nail-down installation. Underlayment/industrial grade particle board sheeting over existing wooden subfloor is usually suitable for glue down applications. See the manufacturer's specifications to ensure that the adhesive is suitable for use over underlayment/industrial particle board sheeting. Countersink all screws/ nails and sand any uneven edges smooth. High spots should be sanded smooth, and low spots should be shimmed with plywood secured to the subfloor and sanded flat.

CEMENTITIOUS PATCH - WOOD SUBFLOOR
Do not use cement-based patch to correct any wooden subfloor problems in preparation for nail down. In the event of moisture, determine the source, eliminate, and allow subfloor to dry. If the subfloor is less than the above specified thickness or sanded to thickness less than specified see the above standards for top sheeting.
NOTE: Particle b
oard sheeting of existing wood subfloor and Portland-based leveling compounds are acceptable for glue-down or floating applications only (they are NOT suitable for nail-down applications). See adhesive manufacturer specifications for installation over particle board. Not all adhesive manufacturers allow glue down to particle board.

EXISTING WOOD FLOOR – ON WOOD SUBFLOOR

When installing over an existing solid hardwood floor already attached to the wood subfloor, ensure that the existing floor is sound and firmly attached to the subfloor. Install material at a 90° right angle or 45°angle (across grain) of existing hardwood floor.

NOTE: Do not install in the same direction as the existing floor. Do not install over wood flooring glued to concrete. Unless otherwise specified by the adhesive manufacturer. Follow adhesive manufacturer's instructions as their psi ratings may be different. Follow all adhesive manufacturer's installation specifications.

Below Grade Installation
A concrete slab is considered below grade when any part of the slab is below ground level. For example, a basement with a walk-out is considered below grade. A house cut into a hill is also considered to be below grade if it isn't properly graded to create a drainage swale on the lot. Below-grade slabs must be carefully tested. Diligently follow all adhesive or underlayment pad manufacturer's instructions for below-grade installation. Nail-down installation is not suitable for below-grade installation.

Getting Started

1. Select Installation Type
WOOD SUBFLOOR WITH CRAWL SPACE/ BASEMENT:
ON/ABOVE-GRADE CONCRETE: Glue, Float
ABOVE GRADE LIGHTWEIGHT CONCRETE GYPCRETE: Float, Glue (see adhesive manufacturers' installation instructions for lightweight concrete/ gypcrete installations).

2. Cabinets & Appliances
NAIL DOWN & GLUE DOWN: Cabinets and built-in appliances (sub-zero refrigerators & dishwashers) should be installed prior to the installation of the hardwood floor. **Cabinets and built-in appliances should not be installed on top of the floor.**

Installation of cabinets on top of nail-down or glue down floors can contribute to squeaking objectionable noise in floor Installation of cabinets on top of glue or nail down installation does not invalidate warranty. However, since this is not best practice, should the floor require repair under warranty, We will not be liable for costs to remove and replace cabinets and or countertops to effect repair.

Hardwood flooring should be installed at the same time as carpet and after the following: finishing walls, cabinet installation, appliance installation,

tile & countertop installation.
Standard refrigerators and kitchen oven/range are acceptable for placement on top of the wood floor. Use caution when moving appliances by using a proper furniture dolly, air sled, 1/8" Masonite with glossy side down, or plastic glides designed for movement of heavy appliances. Failure to follow these precautions will damage the floor.

3. Undercut All Door Jambs/Moldings
Remove all shoe and base molding to ensure adequate expansion space. Use scrap piece of flooring to establish the height of the cut. Make allowances for adhesive or underlayment thickness when establishing height of cut.

4. Visual Inspection of Boards
Visually inspect boards for any defects prior to installation. Verify that homeowner has seen product and approves/authorizes proceeding with installation of the floor.

5. Work From Multiple Boxes
Always work from multiple boxes simultaneously and blend the boards throughout the installation. This is especially important with mixed production dates.
We have very good color consistency, and mixed production dates are acceptable for installation. Working from multiple boxes/production dates helps achieve a good blend of color.

6. Pre-Blend Boards to Moldings
Before you get started, open multiple boxes and check how the boards blend with the moldings. At the beginning of the installation, set aside those boards that best blend with the transition moldings on the job.

Installation Alert
Do not use rubber mallets or hammers on the finished edge of the floors. Do not kick the floor into place. Mallets and/or shoes used to kick the floor in place and hammers damage the finished edge, and kicking can scratch the floor.

NOTE: Any defects in milling must be determined in the first 10% or 100 sq. ft. (whichever is less) of the floor being installed. If milling is to industry specifications and instead is related to installation or site related issues the material will not be eligible for replacement.

Proper placement of fasteners is critical to the performance of the floor. Overshooting the fastener weakens the tongue and the damage can telegraph to the surface. Care must be taken not to damage the edge of the plank with mallets or the edge of the nail gun. **Improper placement will create a noisy floor.**

Approved Nail/Staple Systems
POWER NAIL AIR DRIVEN MODEL 50P Flex
18-gauge, Cleat 1 ½". Use 12 oz. rubber hammer to activate the gun. Gun adjusts to nail 3/8",7/16", ½", 9/16", 5/8" .

POWER NAIL AIR DRIVEN MODEL 50F
18-gauge, Cleat 1 ½". Trigger activated.
Gun adjusts to nail 3/8",7/16", ½", 9/16", 5/8" .

POWER NAIL AIR DRIVEN MODEL 200
PRIMATECH AIR DRIVEN MODEL Q550R
Adjustable base plate and surface rollers 18-gauge, L cleat x 1 ½" Use 12 oz. rubber hammer to activate gun. Adjusts to nail 3/8",7/16", ½", 9/16", & 5/8".

PRIMATECH AIR DRIVEN MODEL 180
Adjustable base plate and sur¬face rollers 18 gauge coated staple, 1/4" crown. Trigger activated. Gun adjusts to 3/8", 7/16", 1/2" 9/16", 5/8" .

Herringbone / Double Herringbone Installation
Glue-down installation:
A. Herringbone/double herringbone patterns are often glued down. Refer to the Glue-Down section for glue-down information.

B. Nail-down installation: Nail herringbone or double herringbone patterns using the appropriate nailing schedule for the flooring being installed as long as the pattern continues to have an exposed side tongue for nailing. Refer to the Nail-Down Installation chapter for nailing schedule information and glue-assisted installation methods. (Be extremely cautious of the impact from the pneumatic nailer on the herringbone/double herringbone planks. The impact can force

the planks out of their intended placement, knocking the pattern out of square.)

C. Nail-assisted glue-down:

1. With full-spread installations over wood subfloors, it is sometimes necessary or helpful to blind-nail the flooring into the wood substrate periodically.

2. This method may be appropriate where the flooring needs to be driven tight during the installation. There is no recommended nailing schedule for this method, as the fasteners are strictly used as a supplement to the glue-down method.

D. Herringbone direction should be installed in accordance with client preference. The distinct directional pattern may look best with the points in the direction of the longest dimension of the room or toward a major focal point.

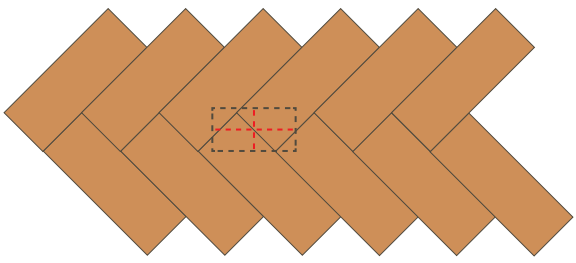
E. Herringbone-patterned floors can be ordered with 'left' and 'right' pieces because the pattern is directional. When looking at the face of the boards, they are a mirror image of each other. A universal form has grooves on both ends, and slip-tongue or spline is used at each end connection.

F. When laying out the floor prior to installation, be sure to work from multiple bundles or packages to ensure variation.

G. Laying out a herringbone pattern:

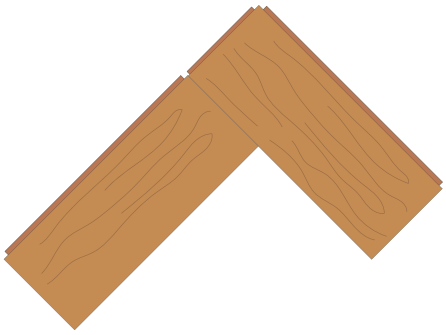
1. Using the center-layout method, measure the room for the center and strike the main control, perpendicular, and diagonal reference lines, as detailed in the Layout chapter.

2. Find true center on the pattern to establish the working lines.



a. To find the center of a herringbone pattern:

i. Divide the diagonal measurement by four. This is the dimension used to establish the working lines A and B on both sides of the control line.



ii. This measurement will vary according to the width of the flooring.

3. Strike two working lines alongside the main control line. Working lines for herringbone should fall through the corners of each alternating slat.

4. Transfer the diagonal lines to the working lines.

5. Dry-lay a small section and measure to confirm a balanced layout.

6. The floor pattern is installed along working lines.

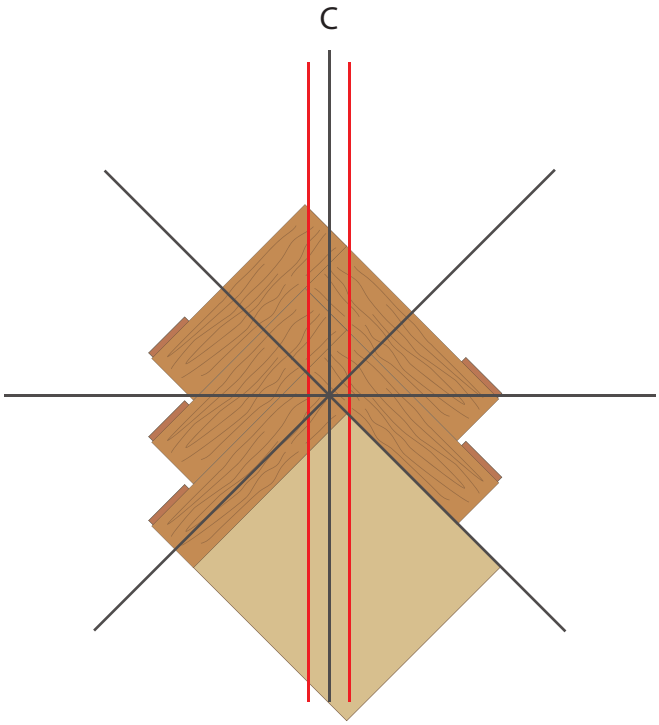
7. Once the working lines are established, the installation can begin.

8. To keep the installation square, cut a square piece of plywood the size of the herringbone pattern and anchor it at the intersection of the working lines and diagonal lines.

H. Installing a herringbone pattern:

1. The starting point must have working lines and diagonal lines.

2. For direct glue, do not spread adhesive over working lines.



3. Start with the tongue facing toward the build direction.

4. Install pattern one row at a time.

5. Periodically check alignment and Squareness using a carpenter square at the head of the run as it progresses.

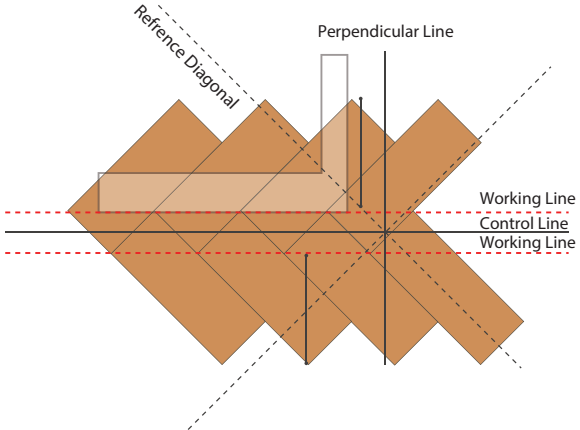
I. To continue the pattern:

1. Dry lay approximately eight boards.

2. Lay a framing square from the points on the working line to the outermost point.

3. Record measurement A; this becomes your working line for the next course.

4. Once measurement A is established, the working lines can be repeated throughout the installation.



Source and Credit for Herringbone/Double Herringbone Installation Instructions

- **NWFA Installation Guidelines 2019 pages 148-149**