Herringbone Installation Guidelines

Important Information before You Begin

1.1 Installer/Owner Responsibility

Carefully inspect all materials before installation. Materials installed with visible defects are not covered under the warranty. Do not install - if you are not satisfied with the flooring; contact your dealer immediately. Final quality checks and approval of the product is the sole responsibility of the owner and installer. Make sure you are installing the correct color; no claims will be accepted for color once the material is installed. Please read the provided warranty for your product before installation.

The installer must determine that the job-site environment and sub-floor surfaces meet applicable construction and material industry standards. We recommend the use of National Wood Flooring Certified Professional Installers. The Manufacturer declines any responsibility for job failure resulting from deficiencies caused by sub-floor or job-site environment or installation related items. All subfloors must be clean, flat, dry and structurally sound.

1.2 Basic Tools and Equipment

Broom or vacuum, moisture meter, chalk line & chalk, tapping block, tape measure, safety glasses, hand or electric saw, miter saw, 3M 2080 blue tape, hardwood floor cleaner, hammer, pry bar, color wood filler, straight edge, trammel points, trowel and tapping block. **Failure to use a tapping properly when installing engineered flooring can /will cause splintering. NEVER STRIKE THE EDGE OF THE FLOORING WITH A MALLET/HAMMER OR IMPROPERLY USE THE TAPPING BLOCK.**

1.3 Putty and Filler Use

Please keep on hand like colored putty or filler as well as colored markers to touchup minor chips and nicks in the finished product. It is also advised to fill any allowable gaps before leaving job-site

1.4 **Recommended Installation Methods**

Herringbone pattern is approved for glue down method of installation using an adhesive approved for wood flooring that does NOT contain water. Moisture Cured Urethane or Silane based formulas are approved.

Job-site conditions

2.1 Handling and Storage.

- Do not truck or unload wood flooring in the rain, snow or other humid conditions.
- Store wood flooring in an enclosed building that is well ventilated with weather proof windows. Garages and exterior patios are not appropriate for storing wood flooring
- Leave adequate room for good air circulation around stacks of flooring and do NOT store directly on concrete – elevate the material.

2.2 Job-site Conditions

- Wood flooring should be one of the last jobs completed in a construction project. Prior to installing hardwood floors, the building must be structurally complete and enclosed, including installation of exterior doors and windows. All finished wall coverings and painting should be completed. Concrete, masonry, drywall, and paint must also be complete, allowing adequate drying time as to not raise moisture content within the building.
- HVAC systems must be fully operational at least 7 days prior to flooring installation, maintaining a consistent room temperature between 60-75 degrees and relative humidity between 30-50%.
- Engineered hardwood floor may be installed above, on, and below grade level.
- It is essential that basements and crawl spaces are dry. Crawl spaces must be a minimum of 18" from the ground to underside of joists. A vapor barrier must be established in crawl spaces using 6 mil black polyethylene film with joints overlapped and taped.
- During the final pre-installation inspection, sub-floors must be checked for moisture content using the appropriate metering device for wood and/or concrete.
- **Engineered flooring is typically ready to install upon delivery in most normal environments when the site temperature is maintained between 60-75 degrees and 30% - 50% ambient RH. Ambient temperature and humidity along with subfloor moisture content must be in synch with the moisture content of the wood.**
- Herringbone Pattern flatness required - 1/8" in 6' to avoid pattern run off and difficulty in assembling. Sand high areas and joints, then fill low areas with the appropriate cementitious sub-floor leveling compound. The leveling material should provide structural soundness for the flooring being installed. Structural soundness is the responsibility of the installer.

Sub-floor Preparation

3.1 Wood Sub-floors

- Sub-floor must be structurally sound and properly secured with nails or screws every 6 inches along joists to reduce the possibility of squeaking.
- Wood sub-floors must be flat, dry, structurally sound and free of wax, paint, oil, and debris. Replace any water-damaged or delaminated sub-flooring or underlayment. Flatness – 1/8" in 6'
- **Preferred sub-floors** - 3/4" CDX Grade Plywood or 3/4" OSB PS Rated sub-floor/underlayment, sealed side down, with joist spacing of 19.2" or less; **Minimum sub-floors** - 5/8" CDX Grade Plywood sub-floor/underlayment with joist spacing of no more than 16". If joist spacing is greater than 19.2" on center, add a second layer of sub-flooring material to bring the overall thickness to 1-1/8" for optimum floor performance. Hardwood flooring should be installed perpendicular to flooring joists. If flooring is installed parallel with joists, then an additional layer of ½" plywood must be installed to meet minimum requirements of 1-1/8"
- **Sub-floor moisture check.** Measure the moisture content of both the sub-floor and the hardwood flooring with a pin moisture meter. Sub-floors should not exceed 12% moisture content. **The moisture difference between sub-floor and hardwood flooring should not exceed 4%. If sub-floors exceed this amount, an effort should be made to locate and eliminate the source of moisture before further installation.**

3.2 Concrete Sub-floors

- Concrete slabs must be of high compressive strength with minimum 3,000 psi. In addition, concrete sub-floors must be clean, flat, dry, structurally sound, smooth and free of wax, paint, oil, grease, dirt, non-compatible sealers and drywall compound etc.
- Engineered hardwood flooring may be installed on, above, and/or below-grade.
- Concrete substrate flatness – 3/16" in 10' or 1/8" in 6'
- Lightweight concrete that has a dry density of 100 pounds or less per cubic foot is not suitable for engineered wood floors. To check for lightweight concrete, draw a nail cross the top. If it leaves an indentation, it is probably lightweight concrete. Lightweight concrete can be used if properly treated. Check with the adhesive manufacturer for the proper material to use
- Concrete sub-floors should always be checked for moisture content prior to the installation of wood flooring. Standard moisture tests for concrete sub-floors include relative humidity testing, calcium chloride test and calcium carbide test.
- Measure the moisture content of the concrete slab using a TRAMEX concrete moisture meter. If it reads 4.5% or above, then this slab must be checked using

calcium chloride tests. Flooring should not be laid if the test result exceeds 3 lbs. per 1000 sq.ft. of vapor emission in a 24-hour period. Please follow the ASTM guideline for concrete moisture testing.

- As an alternative method of concrete moisture testing, In-situ relative humidity testing may be used (**This is the preferred method**). Reading shall not exceed 75% relative humidity.

3.3 Sub-floors other than wood or concrete

- Ceramic, terrazzo, resilient tile and sheet vinyl, and other hard surfaces are suitable as a sub-floor for engineered hardwood flooring installation.
- The above tile and vinyl products should be level and permanently bonded to the sub-floor by appropriate methods. Clean and abrade surfaces to remove any sealers or surface treatments to ensure a good adhesive bond. Do not install over more than one layer that exceeds 1/8" in thickness over suitable sub-floor.
- Substrate must meet or exceed adhesive manufacturers guidelines for flatness

3.4 General Radiant Heat Installation Instructions

- To minimize the effect that rapid changes in temperature will have on the moisture content of the wood floor, NWFA recommends that an outside thermostat be installed. If one is not present, suggest to your customer that this should be considered. Unlike conventional heating systems, which switch on as needed, radiant systems work most effectively and with less trauma to the wood floor if the heating process is gradual, based on small incremental increases in relation to the outside temperature.
- Subfloors should have proper moisture tests according to the moisture testing procedures outlined in Chapter 3. Of the National Wood Flooring Association Installation instructions
- The essential requirement in proper applications of wood flooring over radiant heated systems is to avoid penetration of the heating element. Radiant-heated subfloor systems can be concrete, wood or a combination of both.
- If the subfloor is concrete and it has cured, turn the heat on, regardless of season, and leave it on for at least 5-6 days to drive out residual moisture before installation of the wood flooring.
- Some installation systems, particularly glue-down applications, require the heat to be reduced or even turned off before installation of the flooring begins, so the adhesive does not cure excessively.
- 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.
- If flooring materials that conduct heat at different rates are on the same circuit or heating zone, check with the HVAC mechanical engineer before proceeding. Ensure that floor temperature does not exceed 82 degrees. The use of an in-floor temperature sensor is required to prevent the subfloor from exceeding the temperature of 82 degrees.
- Radiant heat is dry heat. A humidification system may be necessary to maintain wood flooring in its comfort zone of 30%-50% R.H.
- Subfloors should have proper moisture tests according to the moisture testing procedures outlined in Chapter 3. Of the National Wood Flooring Association Installation instructions

CAUTION: WOOD DUST

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

WARNING

Drilling, sawing, sanding or machining wood products can expose you to wood dust a substance known to the State of California to cause cancer. Avoid inhaling wood dust or use a dust mask or other safeguards for personal protection. For more informationgo to https://www.p65warnings.ca.gov/products/wood-dust

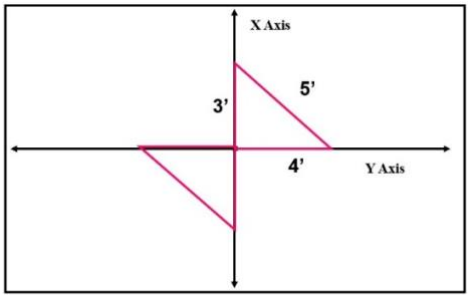
Installation

4.1 Preparation

- Check the room for squareness. Measure the diagonals of the room – if they are equal the room is square. Adjust if necessary.
- Herringbone is a difficult pattern to install and it is important to decide the orientation of the pattern in relation to the room
    - The long dimension of the room
    - Pattern running to the major focal points of the room
- To achieve a uniform color and shade mixture across the entire floor, open and work from several different cartons at a time.
- Undercut door casings 1/16" higher than the thickness of the flooring being installed. Also remove existing moldings.

4.2 Layout

- Measure and find the center point of the room at each end of the room. Snap a line using a chalk line – this is the control line. If measurements are uneven split the difference and adjust the line.
- From the center of the room then set your perpendicular line using a Trammel point – this line is 90 degrees to your primary line. Use the 3,4,5 method to determine if the 2 lines are square to each other
- Set diagonal lines using trammel points – Measure from center point equal distance along primary line and use trammel points to form intersecting arcs. Snap line through the intersecting points and center point. Repeat this process for the secondary Diagonal line
- From you center line establish the working lines to set the pattern.



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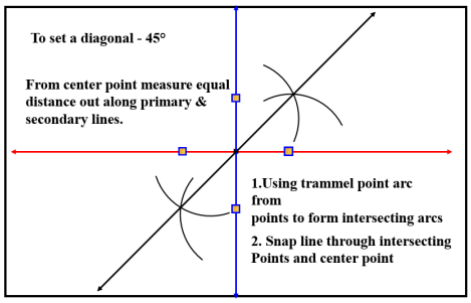

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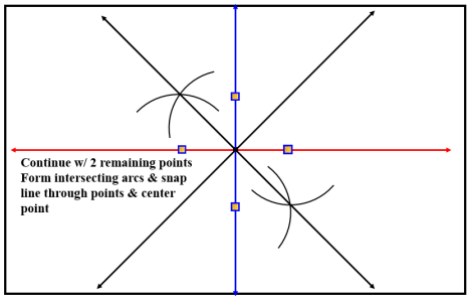

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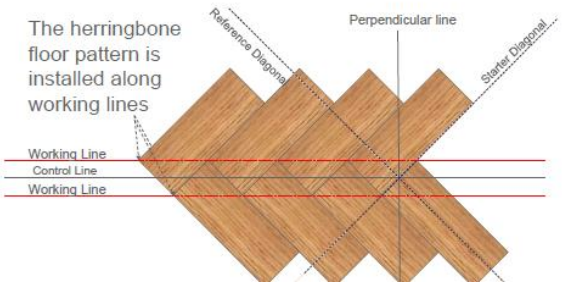

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Layout Procedure- Determining the diagonal dimension of the flooring.

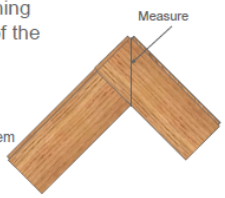
- Measure Diagonal

or

- Calculate using Pythagorean Theorem

$\sqrt{a^2 + b^2} = c$

$\sqrt{2.25^2 + 2.25^2} = 3.18\ (3\,3/16)$



This measurement will vary according to the width of the flooring

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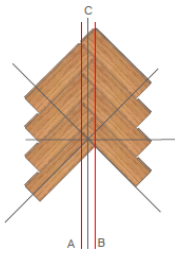
Layout Procedure-

1. Divide the diagonal measurement by 4.
2. This is the dimension used to establish the working lines A and B on both sides of the control line



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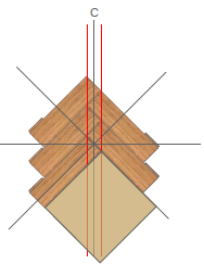
Example – The diagonal of a 6.5" wide plank is 9.25"/4= 2.3125 (2 5/16") so the working lines are 2 5/16" measured from the control line. Measure and snap lines for reference to work from.

- **Once the working lines are established the installation can begin.**
- **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.**



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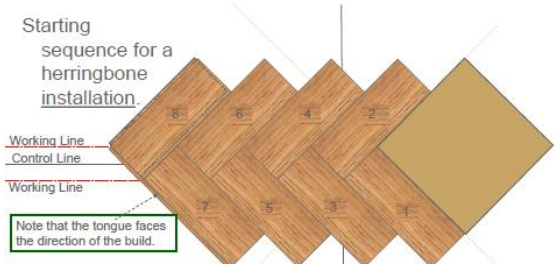
Starting sequence for a herringbone installation.



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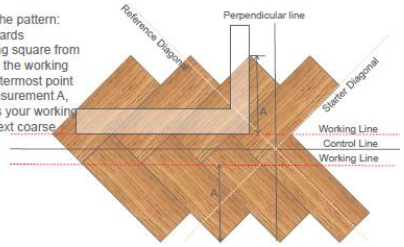
To continue the pattern:
•Dry lay 8 boards
•Lay a framing square from the points on the working line to the outermost point
•Record measurement A, this becomes your working line for the next coarse



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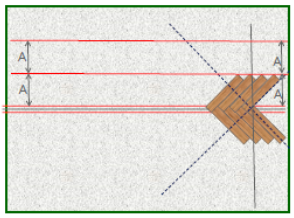
Once measurement A is established,the working lines can be repeated throughout the installation.



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The Preceding information is from the National Wood Flooring Association publication – Herringbone Layout and is used with NWFA permission.