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# INSTALLATION REQUIREMENTS FOR WOOD FLOORS

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## General

Wood is hygroscopic, ie, it is a "living" material. Depending on the ambient air humidity and temperature, the material either emits or absorbs moisture. This is associated with a change of volume (swelling or shrinkage). It is therefore important that there is an "expansion gap" or "movement joint" in between the floor and the wall and other fixed objects when a wood floor is installed floating. To stop the floor absorbing moisture prior to installation, it is important not to open packaging until just before installation.

Many mistakes and damage can be avoided by studying the installation instructions before starting installation and then following them carefully.

Note that moisture levels in new build premises often remain relatively high by the time parquet floors are installed.

To avoid damage, it is important that the relative humidity during and after installation is between 45% - 60%. Therefore, the installation site must be already having door and windows are in place. The temperature of rooms and materials must be at least 18°C - 24° C. A parquet floor must not therefore be installed until all other trades, such as painting, dry wall, masonry and tile laying, have finished their work and the site has the correct RH.

Moisture protection is not normally necessary on structural floors where the relative humidity is below 60%. Note that newly cast structural floors do not meet this requirement, so moisture protection is always needed.

Moisture protection on the following subfloors, whatever their age, is obligatory for the reasons given above:

- Concrete floor lying directly on the ground (ground-supported slab)
- floor above warm or humid area (e.g. boiler room or laundry room)
- Structural floor above a ventilated crawl space foundation
- Lightweight concrete floor structures
- Underfloor heating

If the subfloor's relative humidity is higher than 95%, a plastic sheeting vapour barrier will not provide sufficient moisture protection. Further moisture barrier method to apply. Refer to manufacture for further assistance.

Wood floors should always be laid staggered, even in small areas such as halls or small rooms. Distributing the short ends evenly means that the floor will remain flat and level even during seasonal climate changes.

## General preparations

- Store the floorboards in their packaging.
- Open the packs only when needed during installation.
- Read the installation instructions carefully before installing.

## General preparations for sub-floor

### Wooden sub-floor

- The subfloor must be dry, level, clean and solid. Remove fitted carpets.
- Plywood sub-floors should be sound and flat. The floor must be flat to within 3/16" over a 10' radius. Should there be low areas, they must be levelled with a cementitious flooring grade patching or levelling compound (except for mechanically fastened systems) using the manufacturer's recommended procedures. Use shims, additional plywood, or layers of builders felt to fill low areas beneath mechanically fastened systems.
- The moisture variance between sub-floor and flooring material should not exceed 3%-4%.
- OSB (minimum 5/8" (PS2 rated/ underlayment grade) is acceptable, but 3/4" plywood is preferred.
- Plywood should be dry and installed at right angles to the existing floor joists using suitable fasteners. The end joints of the sub-floor should break across different points throughout the floor. This will provide a more rigid substrate. Refer to panel manufacturer's recommendations for use as a sub-floor and its recommended fastening systems.
- 1" x 4" or 6" lumber may be used; however, the boards must be dressed, dry, and installed at no less than 45° angles to the floor joists. They should be secured with the appropriate nails, and by face nailing with 2 nails at each joist.

**NOTE:** Our hardwood flooring is dried to moisture content (EMC) of 6-9%. Failure to maintain the 3%-4% variance between sub-floor and flooring can lead to dimensional instability. If job site geographical locations are expected to change the EMC significantly, it is the responsibility of the installer to make the proper adjustments for those variances.

## Concrete sub-floor

Check that the concrete subfloor is flat and level over measured lengths of 2 m and 0.25 m. If any unevenness exceeds  $\pm 3$  mm over 2 m or  $\pm 1.2$  mm over 0.25 m, the floor must be levelled first. Kroya also accepts a measured length of 1 m. The tolerance in this case is  $\pm 2$  mm.

- Check the humidity of the subfloor with adequate test instruments . A Calcium Chloride Test-moisture transfer cannot exceed 3 lbs. /1000 sq. ft. in a 24 hour period (2 lbs/1000 sq. ft. for radiant heat applications).
- Requirements, moisture content limits: For concrete sub floors: < 2% CM / or < 85% RH at certain depth depending on thickness of concrete construction. For anhydrite < 0.5 % CM.
- Subfloors consisting of newly cast concrete joists or lightweight concrete joists, ground- supported concrete floors, above warm or humid areas, over crawl space foundations or over an underfloor heating system must first have age-resistant 0.2 mm polyethene (PE) sheeting laid to protect against moisture. Lay the sheeting with a min. overlap of 100 mm. At the overlap joint tape the joint with 80-100mm width tape. The subfloor must be cleaned thoroughly to prevent mould. If the subfloor's relative humidity is higher than 95%, a plastic sheeting vapour barrier will not provide sufficient moisture protection.
- A new concrete floor must dry at least 1 to 1.5 weeks per 10mm (3/8") thickness up to 40mm (1-1/2") with sufficient ventilation. Thicknesses over 40mm (1-1/2") require twice as much drying time. For example, a 60mm (2-1/2") concrete subfloor must dry for at least 8 weeks. The moisture content must be less than 2.5% (CM method) or less than 5 lbs/24 hour per 1000sqft (Calcium chloride method ASTM 1869).

# INSTALLATION REQUIREMENTS FOR WOOD FLOORS

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## General preparations before installation

- The room's relative humidity must not exceed 60% RH. The temperature of the room and the boards must reach at least 18°C.
- Put damaged or faulty boards to one side. They may be surplus or useful for finishing off. You can, of course, exchange any damaged boards where you purchased them.

We recommend that you consult your floor supplier or ourselves about building moisture if you want to lay the floor on a construction other than those described in our brochure Subfloor Requirements and Underfloor Heating if you want to lay a large floor or if anything else is unclear.

## Scheduling installation

Wood floors must not be laid until all other work, e.g. painting, wall- papering, masonry, "wet work" and tiling, is completed. The site must have the correct RH. This avoids soiling and moisture damage to the floor.

Installing floors is easier if architraves, etc., are fitted afterwards.

## Storage

Wood flooring must be stored in an area where the RH is less than 60%. Do not open the packs of flooring until you are ready to install. Open the packs only when needed during installation.

Before installing a wood floor, ensure that the material has a minimum temperature of 18°C. It takes approximately two or three days storage in a heated site before the bundles reach the correct temperature. The temperature can be reached more quickly if the floor packs are stacked in several small piles rather than a single pile.

If the protective plastic has been damaged, repair it with tape to prevent moisture damaging the contents.

## Fixtures and fittings

Fixtures and fittings, kitchen island units, partitions, etc., must never be fixed to the parquet in a floating installation. They can be fixed through the floor provided a space is allowed, to prevent the fixed object from pressing down on and trapping the parquet. There must be a movement joint around the space.

Fix all the fixtures and fittings first, and then the floor. If the wood floor must go under the fixture or fitting for any reason, there must be a movement joint under the kickboard.

Modern kitchen units are normally fixed to the wall, with supporting legs at the front resting on the floor. This is generally of no significance for the floor. However, if the worktop is made of marble, granite or another heavy material, the legs should not rest on the floor to avoid trapping it.

If the floor is glued down, fixtures and fittings can be fixed through the floor without affecting the floor's function.

If a wood-burning stove or similar is to stand on the floor, lay (e.g.) chipboard over an area slightly smaller than that of the "spark screen". This not only enables the floor to move freely but also makes it easier to replace boards near the stove if necessary.

The chipboard also takes the weight of the stove. Remember to provide an expansion gap.

## Planning floor installation

Measure the width of the room, and calculate the width of the last row of boards. If it is less 30 mm, you should also cut the first row of boards so as to equalize the widths of the first and last rows. Remember to include the expansion gap.

Plan carefully to avoid exceeding the maximum width (max 18 m for multi-layer parquet with Kroya) and to ensure adequate skirting board dimensions.

## Movement joints in wood floors

Natural seasonal variations cause a certain amount of movement (Expansion and contraction) in wood floors.

This is why a floor must not be laid too close to adjacent walls or other fixed objects. In accordance with HusAMA98 MDB.3, a movement joint must be provided along each edge.

The floor must be able to expand at thresholds, door frames, heating pipes, pillars, stairs, tiled floors, other parquet flooring, etc. It is important to ensure that contraction caused by climate variations in winter will also be covered by the skirting board.

Gaps caused by contraction do not normally occur in floors with Kroya which is why all contraction manifests itself at the outer edges.

An expansion joint (movement joint) between two rooms/floor areas can be concealed with a threshold.

Remember that the width of the expansion joint is the sum of the widths of the movement joints for each connecting area.

Glued floors move less than floating floors because gluing reduces movement. Movement joints 3–5 mm wide are therefore sufficient.

When wood floors are delivered their moisture content corresponds to approximately 40% RH.

A 4 m wide room should therefore have an expansion gap all round of  $4 \times 1.5 \text{ mm} = 6 \text{ mm}$  between the floor and all fixed objects. For practical reasons, allowing a 10 mm movement joint for floors less than 6 m wide is convenient.

When installing floors with Uniclick it is easier if you start on the long side with more doors. If there are doors along the short side of the room, begin each row of boards there. The boards can be installed from both left and right, as well as “backwards”. If the area is geometrically complex, think carefully about the best method of installation, where you should begin laying and suitable places for expansion joint for floors less than 6 m wide is convenient.

Note that the dimensions of the skirting board must never determine the size of movement joints. With large floor areas, the skirting board must therefore be selected on the basis of the required size for the expansion joint and not vice versa.

One solution for a situation that requires a large skirting board: In new buildings, a simple way of permitting additional floor movement is to “stop” wall panels immediately above the floor surface. If the wall panel is 13 mm plasterboard, for example, this provides an additional 13 mm movement allowance. This allows a thinner skirting board to be used than would otherwise be necessary.

The floor's RH normally varies seasonally between 30% and 60%. A wood floor must be able to move with the variation in moisture, which produces both expansion and contraction.

The size of the movement joint in mm is calculated using the formula:  
 $1.5 \text{ mm/metre floor width}$ .

Make sure that the floor does not go under the wall panel.

### **Uneven subfloors**

If small depressions in the subfloor are noticed during floating installation, they can be filled using felt paper (max. 3 layers with under-floor heating). However, do not use more than one layer of felt paper or similar because it is excessively soft. When gluing, never "fill" any unevenness with thick layers of glue.

When gluing down, the laying direction does not matter because the adhesive reduces the movement of the boards. Glued floors can be wider than floating floors, subject to the subfloor requirements.

### **Cleaning the subfloor**

Never leave sawdust or other organic residues on the subfloor. There is a high risk of mould growing in the damp environment that develops when a vapour barrier is laid over the organic materials, although the barrier is a requirement

## **During Installation – Preparation before Installation**

### **Temperature and humidity conditions**

The working temperature when laying should be at least 18°C. This applies both to the boards and to the room air. The relative humidity of the air must be less than 60% before, during and after installation.

### **Opening packs**

The wood floor is supplied 6% -9%. If packs are opened too early, the boards can absorb moisture and expand, which makes them difficult to fit together. If packs have been opened, they must be resealed carefully with tape to stop moisture getting in and adversely affecting the boards.

### **Inspection**

It is always easier to rectify faults if they are discovered early. Always make a habit of inspecting the product at the time of installation. Faulty products can, of course, be exchanged with your supplier or ourselves. Boards with obvious faults that are or should be detectable before installation must not be used. Always make sure that inspection and installation are carried out in good light. *Figure A.*

### **Pattern misalignments**

Minor pattern misalignments that occur during manufacturing are permitted. Transverse strip must fit in the center of the longitudinal strip on the adjoining row of boards.

### **Door openings**

Floors installed through door openings or archways must be divided with an expansion gap which is then covered by a threshold or molding. If an existing threshold is fixed to the subfloor, there must be a movement joint, of the same dimension as the other movement joints in the room, between the wood floor and the threshold. Note that in accordance with RA98, there is a greater requirement for an expansion joint in door openings where underfloor

heating is fitted. The threshold can also be removed, then refitted when the floor has been laid with a joint under the threshold's position. If the threshold is too high, the door can be trimmed accordingly. Cutting the door is easier if you mark the cut line with tape and use a fine-toothed saw.

#### **Fitting skirting boards**

The skirting boards must not press down on the wood floor, as this may trap it. Skirting boards can be fixed to walls using nails, screws or adhesive. Best results are achieved if the joints are mitered. Skirting boards must be adapted to suit the size of the movement joint

**Laying method** – the best way to install Kroya Herringbone and Chevron is by gluing down. It also can be installed as floating but more precaution should be taken like gluing the connections and more support on the floor in order to reduce the movement of the strips.

#### **Important POINTS!!!**

The secret of a successful KROYA Herringbone floor installation is measurement accuracy and subfloor preparation. The more accurate the measurement is, the better the results. Exactitude of room measurement is equally important. When beginning installation, validate measurements regularly and make necessary adjustments. Floor strips are manufactured using the metric system and installation will be much more precise if measurements are taken accordingly.

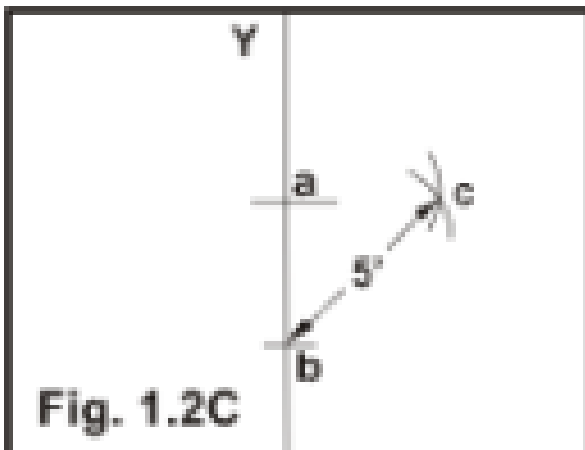
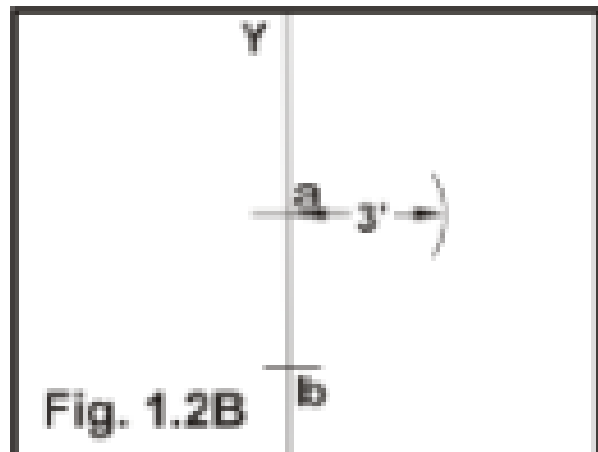
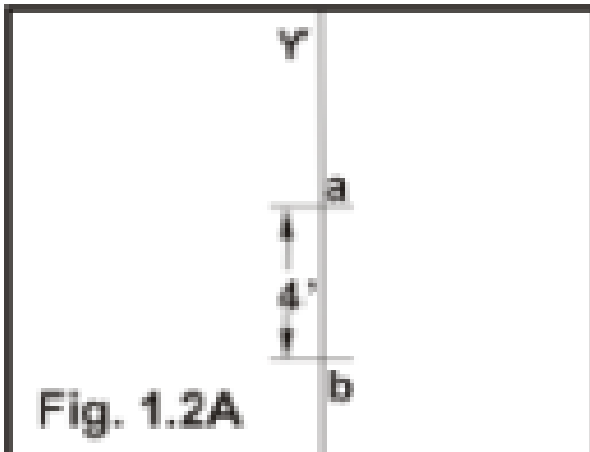
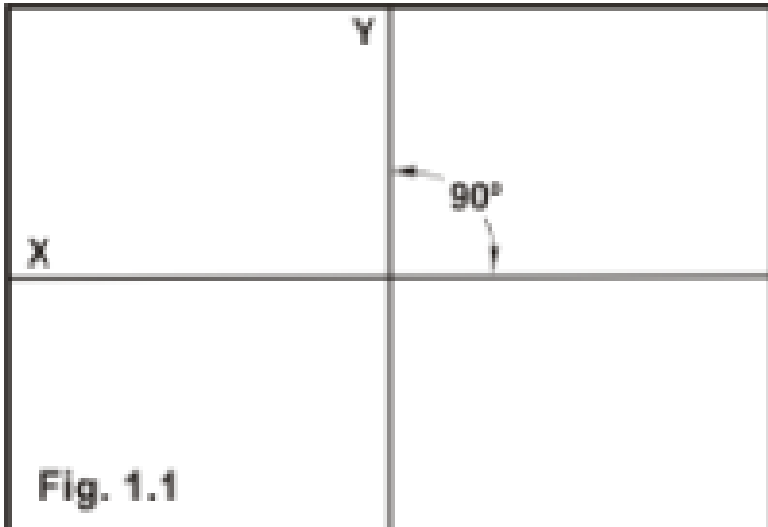
#### **Step I: Pattern direction**

KROYA Herringbone flooring may be installed with reference to any room landmark, but it is very important to consider the orientation of the site such as: -

- The longest direction of the room, or
- Major architectural landmarks, such as main entrance hall, wall with window or fireplace to consider.

#### **Tools and Materials Required**

1. Approved and suggested adhesive by the KROYA.
2. Adhesive manufacturer's recommended trowel.
3. Tape Measure
4. Chalk Line
5. Straight Edge
6. Expansion Shims
7. Floor Protectors
8. Hammer
9. Wood saws



Step 1:

1.1 Snap chalk line (Y) through center of room as shown in Fig. 1.1 above. Next, determine perpendicular line (X). Important: Line X must be exactly 90° to line Y to form perfectly square corner.

1.2 To ensure this angle:



- A) From center point (a) of line Y, measure about 100mm along line Y and mark point (b) (Fig. 1.2A).
- B) From center point (a) measure 75mm in general direction of where line X will be and scribe an arc (Fig. 1.2B).
- C) Return to original 100mm mark (b) on line Y and measure 125mm, scribing an arc crossing 75mm arc from previous step (Fig. 1.2C).
- D) Verify all measurements before proceeding.
- E) If correct, snap chalk line thru intersection of arcs and center point of line Y. Chalk line represents line X and should form 90° angle with line Y as shown in Fig. 1.1.

1.3 Measure out 44.2mm from each side of line Y and snap chalk lines, A & B to serve as guidelines for top corners of boards as shown in Fig. 2.

## Step 2

2.1 Cut starter board from plywood 15/18mm thickness x 550mm x 550mm. Starter board must be perfectly square. Use this piece of plywood to make as a starter/backer board which will be very handy to start first row of strips.

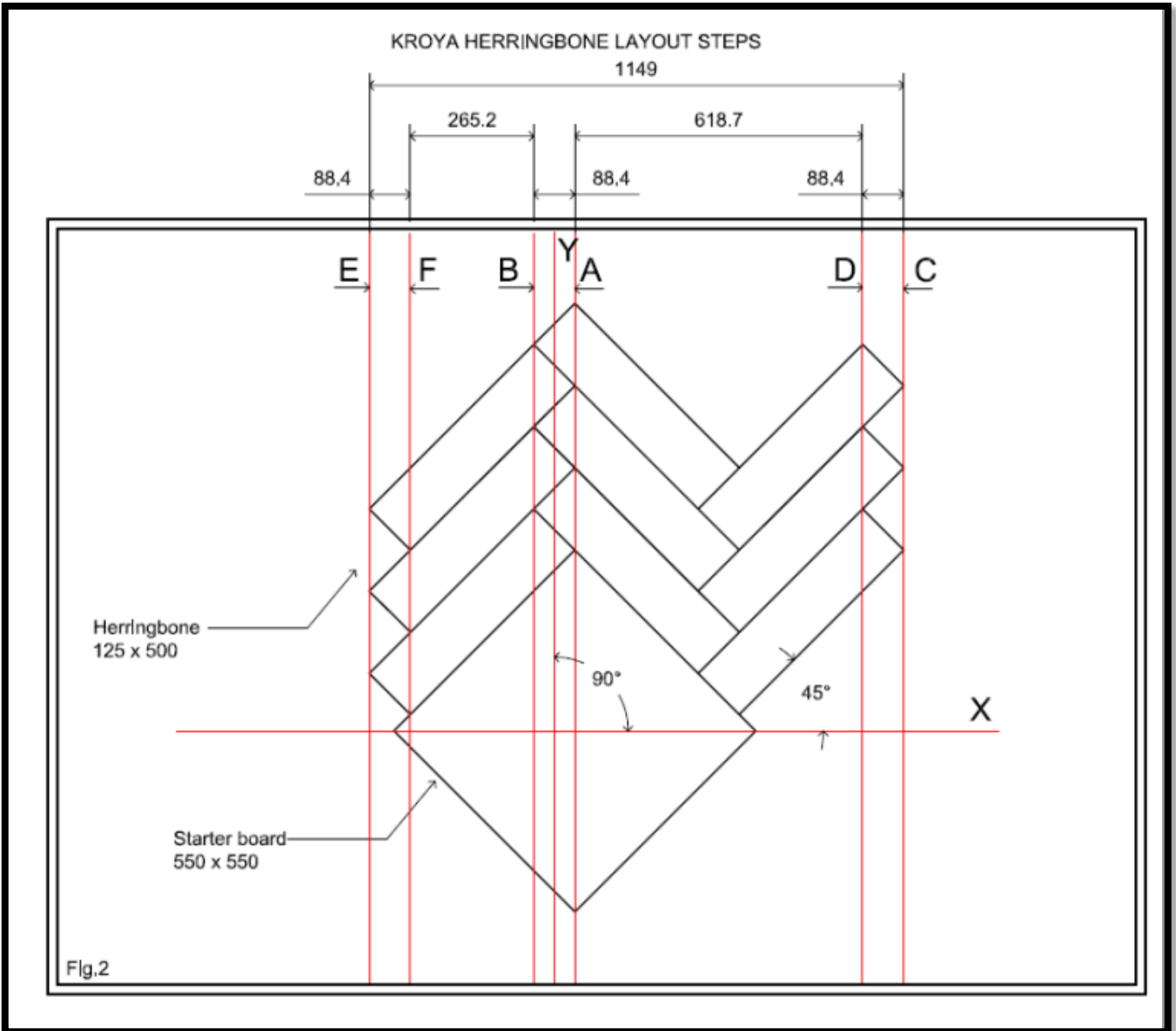
2.2 Align top and bottom corners of starter/backer board with line A and secure to floor (Fig. 2) by nailing the starter/backer to the subfloor. Leave the nail sticking out a bit for easy removal.

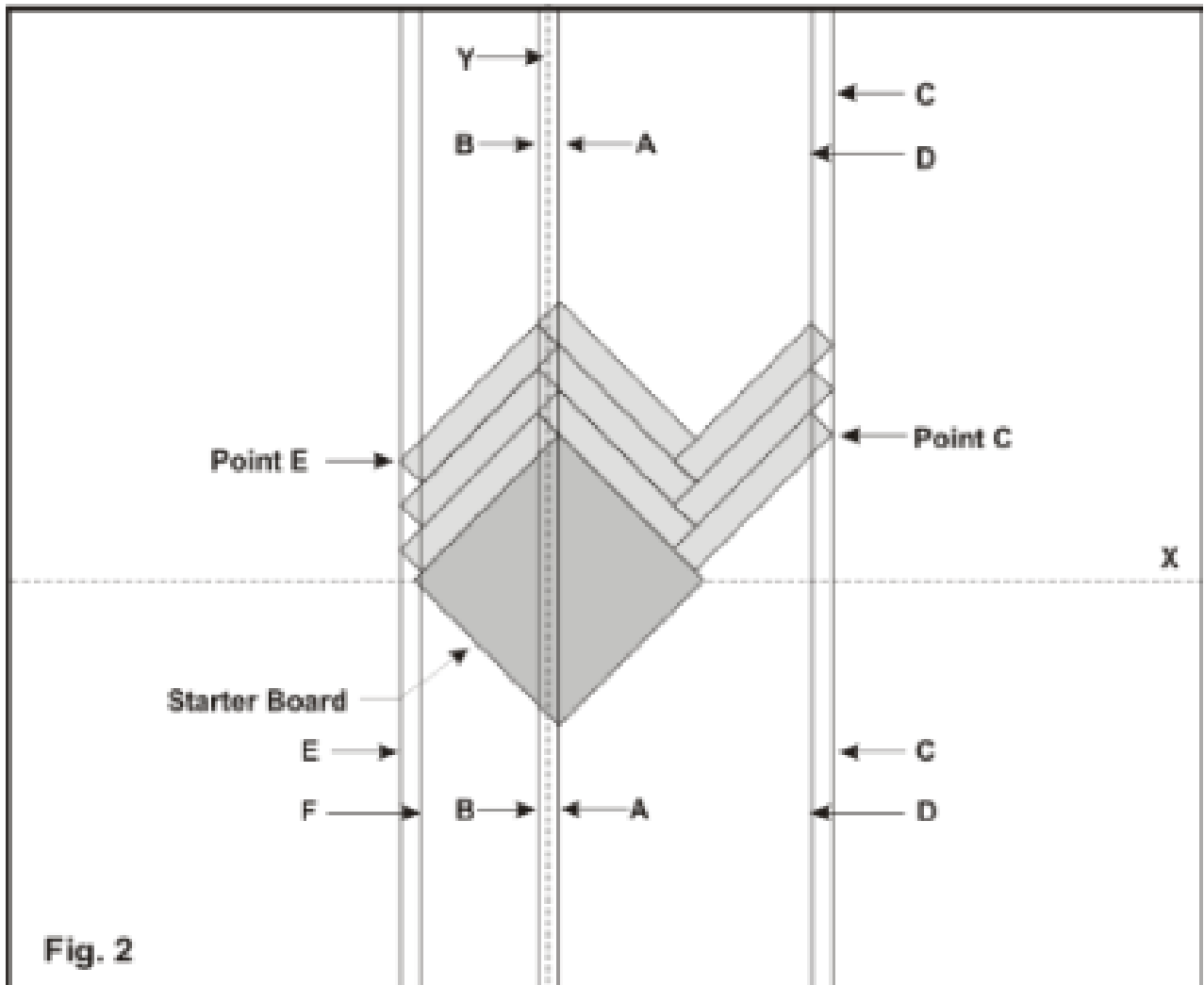
2.3 Dry-lay three rows (for procedure refer to Step 3) to determine distance to point C.

(Fig. 2). Once distance is determined, snap another chalk line to represent guide line C. Repeat procedure for other side, point E and guide line E (Fig. 2).

Begin installation in center of room, aligning one corner E of backer board with guide line B and securing it to subfloor. Place one strip on each side of backer board to ensure measurement accuracy, then remove.

2.4 Parallel to line C and in direction of line Y, snap another guide line (D). Repeat procedure on other side for line F. These lines serve as pattern and adhesive guides.



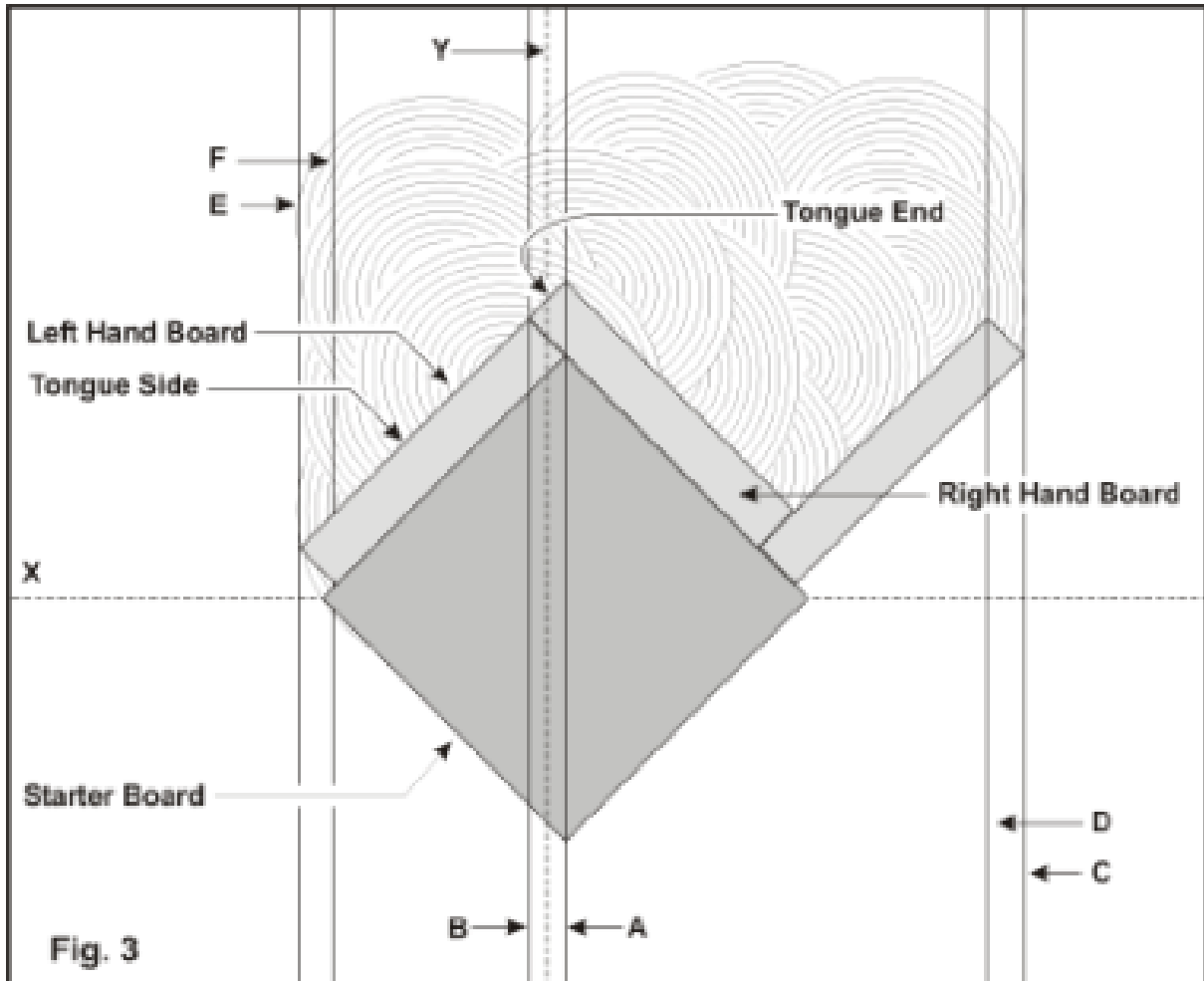


### **Step 3**

3.1 Remove the starter/backer board. Spread adhesive from starter board to outside guide lines C, D, F and E. Amount of adhesive spread should account for flooring able to be laid during adhesive working time.

3.2 Place left-handed board with groove side against left side of starter board. End joint must line up with point on starter board.

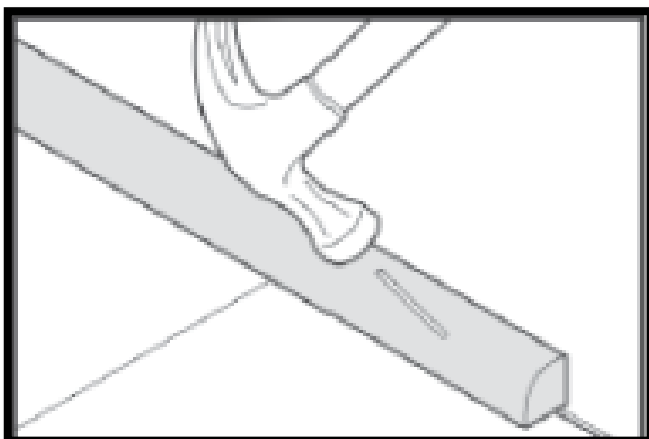
3.3 Place right-handed board with groove side against right side of starter board. Ensure tongue on end joint lines up with long side tongue of left-handed board.



3.4 Continue installing in this manner, alternating installation with left-handed and right-handed boards, until starting area is completely installed.

3.5 Place weight on boards and let adhesive set up (refer to Adhesive supplier recommendation).

3.6 Remove starter board and complete installation as described above. Snap new guide lines as needed.



## **Kroya Chevron**

Please adhere the installation method and side preparation as explained in page 2 – 6.

Important POINTS!!!

The secret of a successful KROYA Chevron floor installation is measurement accuracy and subfloor preparation. Exactitude of room measurement is equally important. When beginning installation, validate measurements regularly and make necessary adjustments. Floor strips are manufactured using the metric system and installation will be much more precise if measurements are taken accordingly.

Step I: Pattern direction

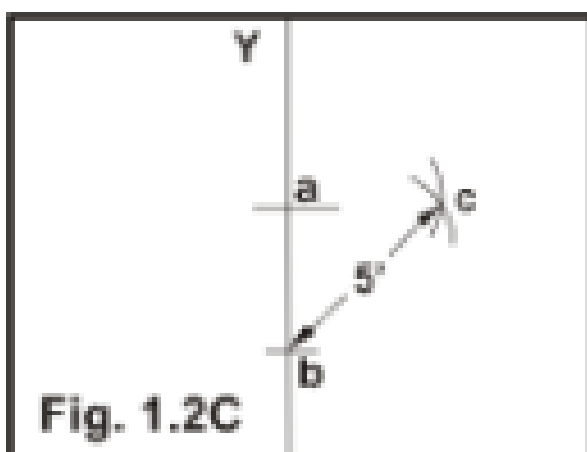
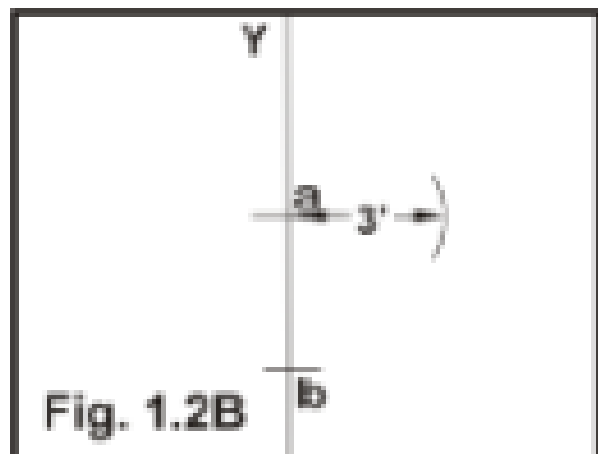
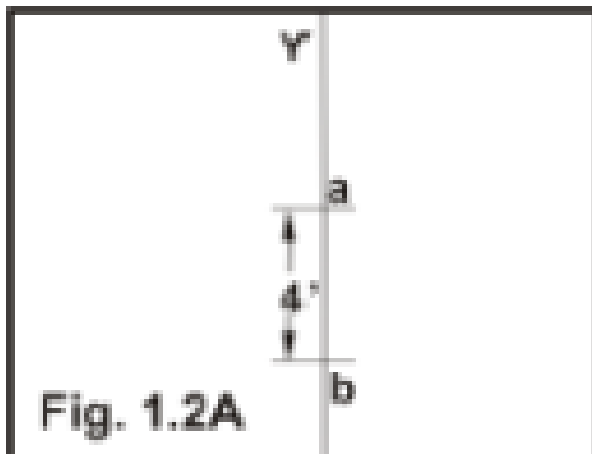
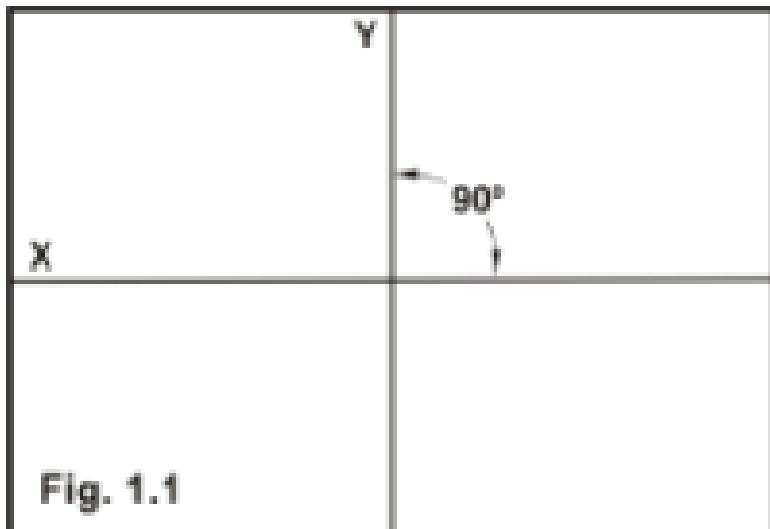
KROYA Chevron flooring may be installed with reference to any room landmark, but it is very important to consider the orientation of the site such as: -

- The longest direction of the room, or
- Major architectural landmarks, such as main entrance hall, wall with window or fireplace to consider.

Tools and Materials Required

10. Approved and suggested adhesive by the KROYA.
11. Adhesive manufacturer's recommended trowel.
12. Tape Measure
13. Chalk Line
14. Straight Edge
15. Expansion Shims
16. Floor Protectors
17. Hammer
18. Wood saws

**Step 1**



1.1 Snap chalk line (Y) through center of room as shown in Fig. 1.1 above. Next, determine perpendicular line (X). Important: Line X must be exactly 90° to line Y to form perfectly square corner.

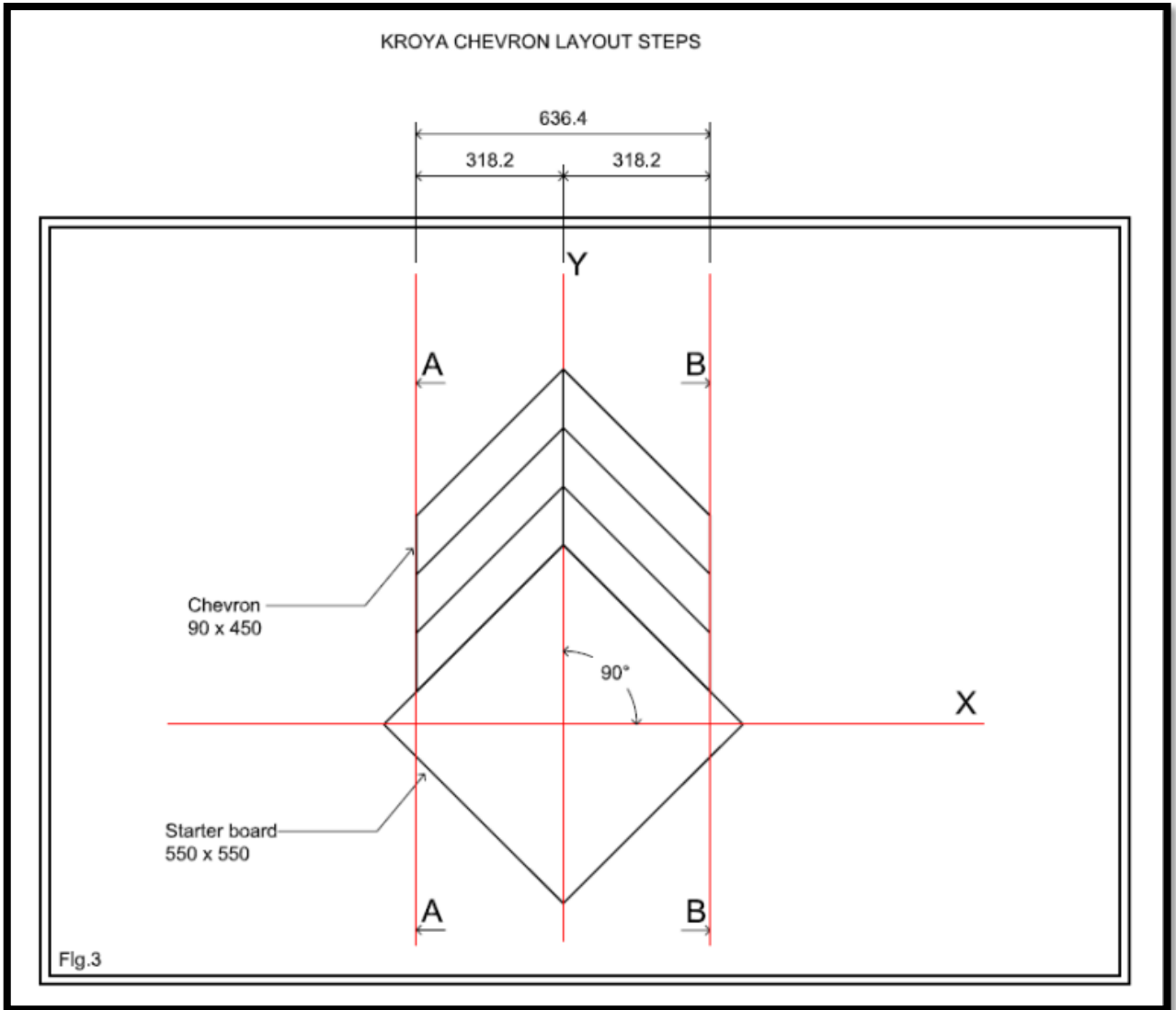
1.2 To ensure this angle:

- A) From center point (a) of line Y, measure about 100mm along line Y and mark point (b) (Fig.1.2A).
- B) From center point (a) measure 75mm in general direction of where line X will be and scribe an arc (Fig. 1.2B).
- C) Return to original 100mm mark (b) on line Y and measure 125mm, scribing an arc crossing 75mm arc from previous step (Fig. 1.2C).
- D) Verify all measurements before proceeding.
- E) If correct, snap chalk line thru intersection of arcs and center point of line Y. Chalk line represents line X and should form 90° angle with line Y as shown in Fig. 1.1.

## **Step 2**

2.1 Cut starter board from plywood 15/18mm thickness x 550mm x 550mm. Starter board must be perfectly square. Use this piece of plywood to make as a starter/backer board which will be very handy to start first row of strips.

2.2 Align top and bottom corners of starter/backer board with line Y and secure to floor (Fig. 3) by nailing the starter/backer to the subfloor. Leave the nail sticking out a bit for easy removal.

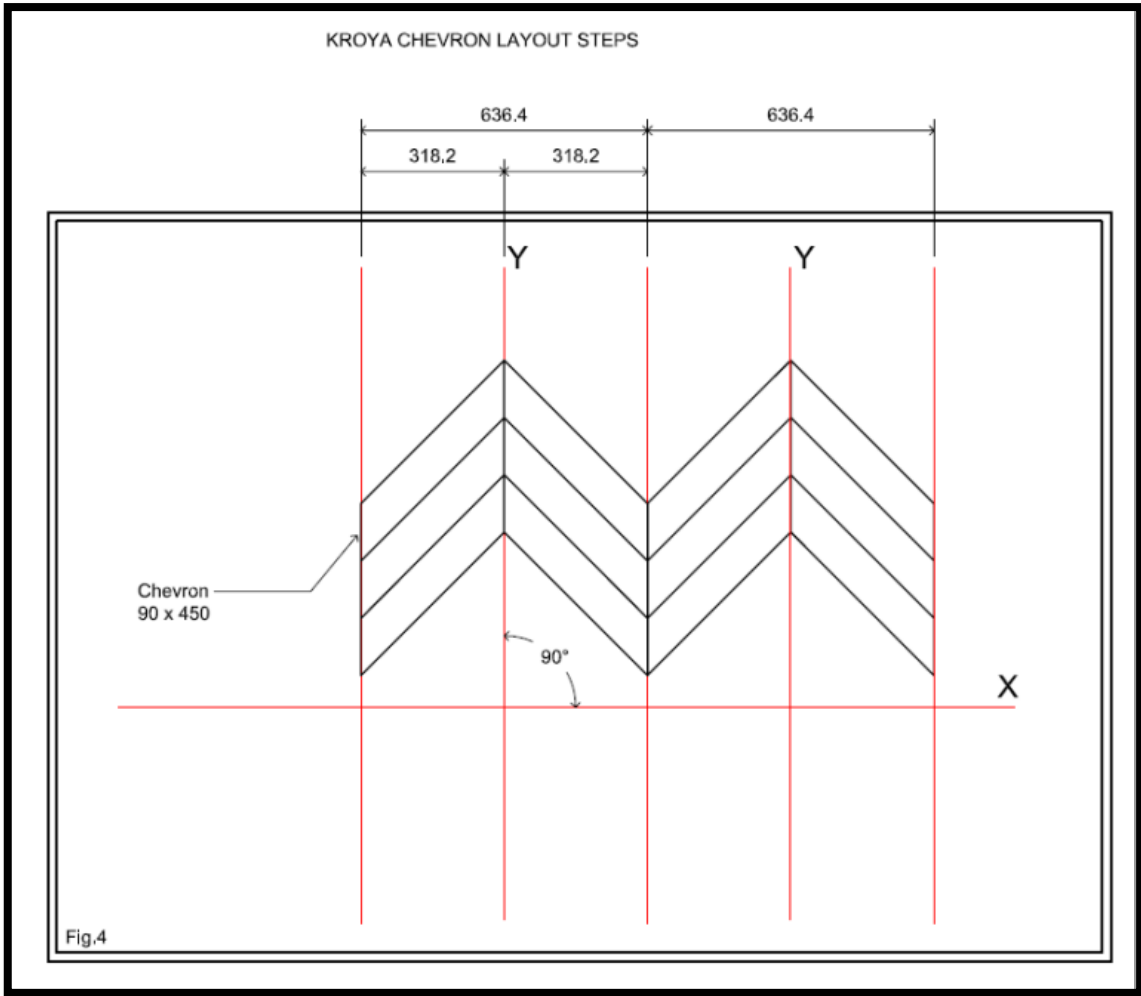


2.3 Dry-lay two to three rows (for procedure refer to Step 3) to determine distance to A and B (Fig. 3). Once distance is determined, snap another chalk line to represent guide line A and B.

Begin installation in center of room, aligning one corner backer board with guide line A and B and securing it to subfloor. Place one strip on each side of backer board to ensure measurement accuracy, then remove.

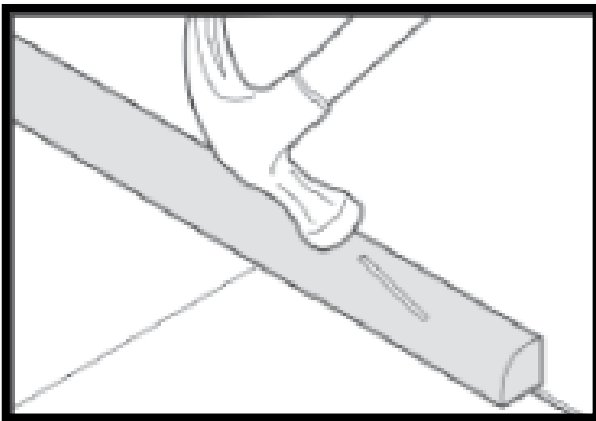
2.4 Continue to lay-up with next row as in Fig.4. You can use the starter/backer board as guideline and to determine the next row's alignment.





### Step 3

- 3.1 Continue installing in this manner, alternating installation with left-handed and right-handed boards, until starting area is completely installed.
- 3.2 Place weight on boards and let adhesive set up (refer to Adhesive supplier recommendation).
- 3.3 Remove starter board and complete installation as described above. Snap new guide lines as needed.



## **After Installation**

Remove expansion shims and use required KROYA solid wood moldings and/or trim pieces to cover expansion space. Always nail moldings to wall, never to flooring! Nailing the moldings on the floor will obstruct the expansion and contraction of the wood floor.

## **Clean Up**

Immediately clean any adhesive spilled on wood flooring during installation.

## **Maintenance**

Clean floor using dry dust mop or damp (lightly misted or well rung out) mop or cloth. Regularly use KLUMPP or BONA Wood Floor Cleaner for best results. Do not use oil soap or water emulsion, self-polishing waxes. Never wet mop floor. Place Peel & Stick Floor Protectors on furniture legs to prevent damage. See KROYA Floor Care Guide & Maintenance procedure in [www.kroya.com](http://www.kroya.com).

- When using acoustic underlayment, it must be glued down over subfloor prior to gluing down strips using the same recommended adhesive.
- Extremely precise strip milling may require use of tapping block for better tongue and groove fit.
- Row to row installation requires that no glue seeps into grooves at any time for perfect tongue and groove fit.

Avoid getting adhesive on hands to minimize clean up. Wipe any adhesive from floor right away, using solvent and towels. Use paint thinner or lighter fluid to remove stubborn adhesive spills.

To maintain strips in place and avoid strip movement causing gapping during installation, use 3M blue adhesive tape.