

INSTALLATION GUIDE

FOR MODELENGINEERED WOOD FLOORING

ModelEngineered



The investment that hardwood flooring represents in the home is an important one and customers want their floors to last. This is why product quality and the quality of the installation are of the utmost importance.

Following the instructions in this installation guide will result in your total satisfaction with ModelEngineered flooring for years to come. These installation guidelines provide minimal requirements. However, the installer must ensure compliance with legislation in effect in the country where the products are installed.

ModelEngineered products are designed for use on concrete, plywood, oriented strandboard subfloors and any other material qualifying under standards in effect for structural materials strong enough to support the stress generated by securing systems. ModelEngineered flooring may be installed in the basement or on any other storey in the home.

PLEASE READ ALL INSTRUCTIONS AND INFORMATION ON THE MODEL WARRANTY BEFORE PREPARING AND INSTALLING YOUR FLOORING.

The installation of flooring should be the last step in the construction or renovation of a house.

Preparation

Installers will optimize the quality of their installation subject to the following conditions.

- Stable temperature. Premises must be heated to 22 °C for seven days prior to the installation. At the time of installation, the temperature should be 22 °C (72 °F).
- Stable relative humidity. A few days before the installation, relative humidity on the premises must be maintained at a stable 37% to 45%.
- Proper storage of the boxes in the home. Engineered wood boards should remain sealed in their boxes until installation. They should be stored at ground level in the home or on a storey above, away from exterior walls with a minimum air space of 4 in (10 cm) between the floor and boxes, 48 hours before installation.

Installation glued on concrete

Material and tools

- Instruments to measure ambient humidity and moisture content in wood and concrete
- Chalk line
- Measuring tape
- Angle plate and bevel square
- Level board and level
- Sawbench
- Handsaw
- Mitre saw
- Drill
- Trowel (teeth of size recommended by the glue manufacturer)
- Carpenter's hammer
- Nail set
- Pullbar and block
- Deer foot

- Broom or vacuum cleaner
- Scraper
- Levelling compound (water-free)
- Wood glue for engineered products (choose a glue that expands and contracts without losing its adhesive properties)
- Recommended glue:
 - Bostik: EFA, BST, Best
 - Mapei Ultrabond ECO980
 - Sika : T-55, T-54, T-53, T-52
 - Finitec : AD-316, AD-532+, AD-844
- Repair and maintenance kit (Model kit)
- Recommended membrane
 - AcoustiTECH Lead 3.3™ for glued down installation
- Engineered flooring boards (foresee 3 to 5% more than the number of square feet of surface to cover to compensate for cutting losses and imperfections).

Note: Model Hardwood Inc. is not liable for damage caused by using improper tools, glue or membrane other than the brands recommended.

Step-by-step installation

1 – Check moisture content

Before measuring moisture content, the concrete surface must have dried for at least 60 days at an ambient temperature of 22 °C (72 °F) and relative humidity ranging between 37% and 45%.

Use a hygrometer (e.g., Wagner c575 model) to check the moisture content in the concrete. It should not exceed 12% (or 4% if the hygrometer measures water volume). Conduct more in-depth tests using 24 in² (60 cm²) plastic sheets at 200 ft² intervals of concrete surface or do a calcium chloride test to allow moisture in the concrete, which should not exceed 1.4 kg (3 lb) per 28.3 m³ (1 000 ft³) per 24 hours, to evaporate.

If the moisture content in the concrete is between 1.4 kg (3 lb) per 28.3 m³ (1 000 ft³) and 3.26 kg (7 lb) per 28.3 m³ (1 000 ft³), the concrete may be covered with a waterproof membrane approved for use on concrete. Never install flooring if the calcium chloride test indicates a result above 3.26 kg (7 lb) per 28.3 m³ (1 000 ft³).

Liquid concrete sealant compatible with the glue to be used should be applied directly to the slab to avoid possible moisture infiltration in the future.

2 – Check slab level

The level of the concrete slab must be verified. Differences in level must not exceed 1/8 in (0.32 cm) over 6 ft (2 m) or 3/16 in (0.48 cm) over 10 ft (3 m). If depressions must be filled, use a cement-based water-free filler compound with a capacity of 3 000 lb/in². Be careful never to exceed the manufacturer's recommended maximum thickness. Exceeding the recommended thicknesses of filler in depressions may result in filled areas not being strong enough to support the weight of heavy objects.

3 – Subfloor cleanliness

Sweep or vacuum the entire surface. Make sure that the surface is free of wax, paint stains, oil or other substances that might prevent the glue from bonding to the subfloor.

RESILIENT TILES: do not remove this kind of tile. They may be glued to the subfloor by an adhesive that could prevent the glue used to secure engineered flooring in place from bonding properly to the subfloor. However, ensure that the tiles are securely affixed to the subfloor and that the glue bonds properly to the tiles.

4 – Squareness of rooms

Verify the squareness of each room by tracing two plane lines perpendicular to the exterior walls, as close as possible to the centre of the room. Then verify the angles formed using an angle plate. Once squareness is confirmed, you are ready to begin installation.

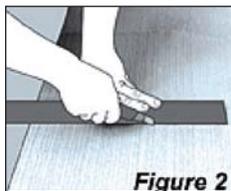
5 – Soundproofing (condominiums)

If you wish to add soundproofing in a condo (for example) an acoustic liner must be laid down. The liner should be glued to the subfloor. Boards are then glued to the liner using the same glue.

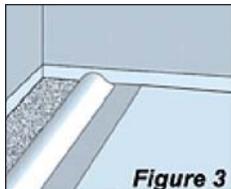
6- Recommended acoustic underlayment

To ensure acoustic performance and stability, we recommend installing the AcoustiTECH Lead 3.3 membrane before installing your ModelEngineered floor. The membrane meets all performance tests required for ideal installation. Failure to use this membrane may void your warranty

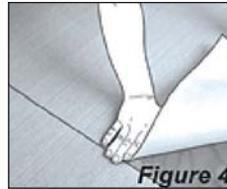
Installing the AcoustiTECH Lead 3.3 Membrane



- Cut the membrane with a retractable blade or scissors (Figure 2).
- Install the aluminized side up.
- Cover the entire surface with the membrane. Seams must be joined without overlapping.
- Lay the membrane strips down perpendicular to strips of engineered hardwood.



- Begin along the wall. Fold lengthwise to uncover the subfloor against the wall (Figure 3).
- Spread adhesive on the uncovered part of the subfloor.
- Unfold the membrane over the glued part of the subfloor.
- Repeat until the entire surface is covered; do not leave an uncovered spot.



- Make sure seams are joined together and glued to the subfloor. It is not necessary to seal the seams with an adhesive tape (Figure 4).



- This membrane must be flattened using a 34 to 45 kg (75 to 100 lb) roller to ensure proper adhesive transfer (Figure 5).

You are ready to install your ModelEngineered flooring.

7 – Mark the start point

Establish measurements from the plane line, tracing a line with the chalk line at the location where you plan to install your first row. Foresee a workspace some 3 ft (1 m) wide plus an expansion space equal to the thickness of your boards.

For example: the workspace will be 36.25 in (92 cm) for boards 3.25 in (82.55 mm) wide and 36.8 in (93.5 cm) for boards 5.188 in (132 mm) wide.

8 – Install the guide

In the workspace area, position a strip of plywood against the subfloor the length of the line drawn.

9 – Apply glue

Apply glue with a metal trowel held, ideally, at an angle with the surface recommended by the glue manufacturer. The teeth of plastic trowels wear down, causing a difference in the rate of application of adhesive and directly affecting the ability of engineered wood to stick to the subfloor. If you elect to use a plastic trowel for a large-scale installation on concrete, have several spares on hand to replace a trowel when its teeth become worn.

Follow manufacturer recommendations (trowel size, recommended quantity of applications, drying time, etc.). Drying times can vary from one brand to the next and bonding delays may differ depending on the temperature, region and ambient humidity.

Never slide or drag a board over a surface coated with adhesive. The elastic memory of the adhesive may cause the board to shift.

10 – Install boards

In the next step of installation using glue, it is important to remember that boards are laid out opposite to an installation using nails. The tongue side of the board faces the start wall and groove side faces the direction of the surface to be covered.

Without exceeding the recommended drying time for the glue, lay down boards, taking care to stagger ends from one row to the next (the ideal space between-board ends is at least 6½ in (16.5 cm).

When a board must be cut to complete a row, it is better to start the next row using the remaining piece. Ensure that cut boards measure more than 6½ in (16.5 cm).

Foresee a 1/2 in (1.3 cm) expansion joint between the last board and the wall. Then remove the plywood strip, apply glue to the work area and install remaining boards.

11 – Use the roller

Once the installation is complete, use a vinyl roller to increase bonding of glue to boards. Protect wood surfaces by covering the vinyl roller with a layer of plastic.

12 – Install mouldings

When installing boards, foresee enough space to insert T and L mouldings, nosing, reducers, etc. Measure correct lengths and cut and secure moulding in place using the same glue.

13 – Cleaning

Once the installation is complete, vacuum and inspect flooring surface. Remove excess glue using a manufacturer-recommended product. Then apply Model cleaner and follow instructions in the Model maintenance kit.

14 – Approval of work

If you are a contractor, we recommend that you have your work approved by the owner or person in charge of the premises.

Precautions to take during installation:

- Never apply glue to board grooves. This will prevent the wood from expanding and contracting and make tongue-and-groove fitting very difficult.
- Keep hands clean when using the manufacturer-recommended product for removing excess glue.
- Never hit board tongues directly with a hammer. Always use a block.
- If you must walk on a newly installed floor, avoid possible spacing between boards by taping them together with adhesive tape (blue 3M tape).
- Wait at least 24 hours before installing furniture or walking freely on flooring.

Nailed installation

Material and tools

- Instruments to measure ambient humidity and moisture content in wood and concrete
- Chalk line
- Putty knife
- Measuring tape
- Angle plate and bevel square
- Level board and level
- Sawbench
- Mitre saw
- Handsaw
- Hand drill and 3/32 in (2 mm) bits
- Carpenter's hammer
- Air compressor and pneumatic floor nailer for engineered wood
- Finishing air hammer
- Flooring nails or staples 1½ in (38 mm) long
- Nail set
- Pullbar and block
- Deer foot
- Broom or vacuum cleaner
- Repair and maintenance kit (Model kit)
- Vapour barrier paper
- Engineered flooring boards (foresee 3 to 5% more than the number of square feet of surface to cover to compensate for cutting losses and imperfections).

Regular tool maintenance ensures quality installation. Check the floor nailer seating plate before beginning work and often during the installation to avoid scratching flooring boards. Note: Model Hardwood Inc. is not liable for damage caused by the use of improper tools or underlayment other than the brands recommended.

During the installation, wear protective gear to avoid possible injuries.

Wooden subfloor

The industry now allows the use of 5/8 in (1.6 cm) CDX exterior-grade plywood with tongue-and-groove fit. The subfloor must be installed with a maximum centre-to-centre spacing of 16 in (40 cm) between joists.

Subfloors made of 3/4 in (1.9 cm) or 23/32 in (1.8 cm) exterior-grade oriented strandboard (OSB) are also accepted. Install panels only at 90° to joists.

We recommend nailing or screwing panels every 1/2 in (1.3 cm) along their inside edges and every 2 to 4 in (5 to 10 cm) along their outside edges. It is always best to fasten panels directly to joists. Ensure that the subfloor is solidly anchored with appropriate fasteners; screw shanks should not be threaded up to their heads. Use of gypsum screws is not acceptable; use of flooring and terrace screws is perfectly suitable. All sub-finish panels should be spaced 1/8 in (3 mm) apart to allow for expansion.

Softwood boards 1 x 5 in (2.5 x 13 cm) or 1 x 6 in (2.5 x 15 cm) laid down diagonally:

This subfloor must be covered with 5/8 in (1.6 cm) sheets of plywood or 3/4 in (1.9 cm) sheets of oriented strandboard (OSB) nailed or screwed in place.

Moisture content

At the time of installation, the moisture content in the subfloor must be less than or equal to 12%. Ensure also that the moisture content in the engineered flooring boards does not differ by more than 4% from that of the subfloor.

Subfloor preparation:

- Remove any remaining glue or staples and drive remaining nails from the old floor covering into the subfloor.
- Even out the subfloor by sanding uneven spots and using flooring leveller.

Once inspected, and after corrections have been made, the subfloor should show no differences in level. Remember that engineered wood flooring will not correct major or apparent defects in a subfloor. All areas of the subfloor to be covered must be inspected. Imperfections and cracks detected will define weak points in the subfloor and corrections to be made. Therefore, it is vital that the subfloor be inspected before installing the engineered wood flooring.

Installation of tar-free vapour barrier paper

The installation of tar-free vapour barrier paper is strongly recommended. The paper insulates the subfloor, preventing moisture from coming into contact with the boards. The tar-free vapour barrier paper must be stapled to the subfloor, parallel to the boards. Edges must overlap 2 to 3 in (5 to 8 cm).

Before beginning work

Before beginning work, ensure good natural lighting of the premises.

Parallelism and squareness

When flooring is to be laid in a house, the entire house must be checked for wall parallelism and squareness to determine if any walls are not parallel and to plan installation consequently.

By always using exterior walls as benchmarks, measuring squareness will precisely verify the parallelism of each interior wall and any obstacles (such as ceramic floors, stairwells, fireplaces, etc.). Thus, the installer will avoid relying on work carried out improperly beforehand.

Installation benchmarks

Squareness can be instrumental in selecting one wall over another as the start point. Normally, the most prominent wall in the room should be selected unless, of course, a ceramic floor joint proves to be a more suitable start point.

When flooring is laid throughout a house, work should normally begin in the longest room, generally the hallway.

Board selection

Board selection allows the installer to lay out a sample representative of the final result. This is the time when wood shades and board lengths can be mixed and matched for a preview of how the future flooring will look.

Note that a 5% industry standard set for acceptable imperfections in boards does not include waste from the installation itself.

Boards must be examined by the installer before they are laid down. Any board installed (nailed in place) is considered accepted by the installer and/or owner. Such boards may not be claimed under warranty on the basis of manufacturing defects or classification errors.

Installing the first row

Remove baseboards and finishing trim with a putty knife. Once the flooring is laid, replace baseboards and finishing trim, nailing them to the walls and not to the flooring. Trim moulding around doors to be able to insert boards and ensure a quality finish to the installation.

Before beginning work, ensure that joists are perpendicular to the first boards laid.

Expansion Joints

The expansion joint around the room plays a fundamental role in ensuring the durability of the flooring, allowing the wood to expand and contract with changes in relative humidity in the room and internal variations in the wood itself.

When humidity levels in a room vary dramatically, the accumulated expansion and contraction of the flooring may result in damage to the appearance or durability of the flooring.

The established standard for an expansion joint is 1/2 in (1.3 cm) for the width of the board and 1/4 in (0.6 cm) for the length.

- If there are baseboards and finishing trim, comply with installation standards for expansion joints.
- If there are baseboards only and their width is insufficient to cover the expansion joint, cut a strip of gypsum at the bottom of the wall when an expansion space is required.

When using the chalk line to draw the line for the first row of boards, it is important to include the 1/2 in (1.3 cm) expansion joint when calculating the board width.

Lay boards (tongue side) the length of the chalk line drawn with the groove side facing the start wall.

The established standard for an expansion joint is 1/2 inch (1.3 cm) all around a room of maximum width of 26 ft (8 m) or maximum length of 52 ft (16 m). Any increase in these dimensions must involve a proportional increase in the expansion joint required up to a maximum of 3/4 in (1.9 cm). To determine the expansion joint, use the larger measurement between the length and width.

Assembling the first rows of boards

A chalk line must be drawn to indicate the positioning of the first row of boards.

There are two methods of installing the first row of boards.

First method (with face nail)

The first method consists of hammering a nail into the top of the board 1 in (2.5 cm) from the side of the board. Ensure that the nail is well hammered in and hide it with a crayon provided in our repair kit.

Second method (without face nail)

This method is used when not nailing boards down as in the first method. Lines of glue are applied to the underside of the board at 6 in (15 cm) intervals. The type of glue used should match wood expansion properties. Do not use wood-working glue. This method ensures board stability without retention over its entire surface, which would hinder future expansion and contraction.

The first boards of the first row are also held in place by a nail driven into the tongue at 45° along its width and length using a finishing air hammer.

Completing the floor

The second row of boards is also secured in place using the finishing air hammer to avoid affecting the alignment of the first row. Subsequent rows of boards must then be nailed down by a nail driven into the tongue at 45° along its length using the conventional floor nailer air hammer instead of the finishing air hammer.

Each row of boards, including the first row, must be nailed down with a minimum of two nails, ideally spaced at 6 to 8 in (15 to 20 cm) intervals, depending on board length.

Note also that a nail located less than 2 in (5 cm) from a board end could eventually cause the board to split.

When a board must be cut to complete a row, it is better to start the next row using the remaining piece. However, ensure that the remaining piece is more than 6½ in (16.5 cm) long.

Air hammer and rubber mallet

When laying down a board, it is important to distinguish between the final adjustment of the board and nailing it down using an air hammer.

The final adjustment of a board should be made using a rubber mallet only. The mallet serves to move the board slightly without damaging the wood.

The air hammer is used only to secure the board in place after adjustment. The force applied by the air hammer must be measured with this sole aim in mind.

Both the conventional floor nailer and finishing air hammers must be calibrated according to manufacturer specifications. To verify compliance with manufacturer specifications, test the tool on a piece of scrap wood to avoid damage to good boards.

We strongly recommend using a floor nailer with a seating plate specifically designed for prefinished, engineered wood flooring to distribute pressure on the board over a larger surface. This method will prevent damage to boards resulting from too much air pressure, too much physical pressure applied to boards or misuse of the air hammer.

Board ends in each row must be staggered at least 6½ in (16.5 cm). Staggering board ends improves the appearance of the floor and its stability in the event of humidity variations. Pressure from boards expanding and contracting is exercised efficiently, especially on the next row of boards. Pressure limited and evenly distributed tends to extend less over the entire floor.

Periodically checking row parallelism will allow you to make appropriate adjustments as needed.

Finishing up

The last rows

When a wall prevents use of a floor nailer (generally on the last three rows) finish installation may be completed as follows:

After selecting a board, drill holes at 45° the length of its tongue. Once the board is laid down, the holes serve to drive in finishing nails using an ordinary hammer. Then use a nail punch to completely embed nail heads.

Since the rubber mallet cannot be used to adjust these last boards, use a deer foot instead.

As for the installation of the first rows, two methods may be used.

First method

The first method consists of hammering a nail into the top of the board 1 in (2.54 cm) from the side of the wall. Ensure that the nail is well hammered in and hide it with a crayon provided in our repair kit.

Second method

This method is used when boards are not nailed down. Lines of glue are applied to the underside of the last row of boards at 6 in (15 cm) intervals. A nail is then driven into the tongue at the end of the board at a 45° angle. Boards in the second row are also nailed in place using the finishing air hammer to avoid changing the alignment of the first row.

Pieces of wood wedged between the last row of boards and the wall may be used to hold the wood in place until the glue has dried.

Special cases

Reverse installation

Sometimes flooring laid down from one room to another requires that boards be installed in reverse order using a slip tongue. The slip tongue transforms a board groove into a tongue, making it possible to lay a board down in the opposite direction in the next room. Holes are drilled in the board groove and the board is secured in place with finishing nails. The slip tongue is then coated with glue and inserted into the board groove, resulting in a tongue. When a new board is laid, installation then proceeds in reverse order.

Walls at 45°

Walls at 45° decrease the amount of support provided to subsequent rows of boards by the first rows. To avoid possible misalignment, use a finishing air hammer or an ordinary hammer to nail in finishing nails for added support. Take care not to hammer in nails within 2 in (5 cm) of board ends.

Abutting ceramic surfaces

At junctions with ceramic flooring, use a board of the same species as the flooring boards to demarcate ceramic flooring.

Nosing

Special boards called nosing can demarcate flooring at a landing. Glued and nailed in vertically, they provide a solid end to flooring.

Reducer strips

Room level may vary from one room to the next. Reducer strips solve the problem. Glued and then nailed in at 45°, they provide the junction between two heights and compensate for a change in level between two rooms.

Installation without glue (floating)

Although mortise and tenon joints are compatible with an installation without glue, Model Hardwood does not recommend this type of installation and offers no guarantee in terms of time and ease of installation.

Installation on radiant heating

Successfully installing engineered wood flooring over a radiant heating system involves special precautions. The higher the temperature, the more the air and materials in the immediate vicinity tend to dry out. In light of this, consumers hesitate to install wood flooring on radiant heating because they fear that the flooring will contract, resulting in unsightly cracks between the boards. Problems may be avoided by taking certain precautions. Since radiant heating affects ambient temperature more quickly than standard heating systems, the humidity rating in the air must be carefully controlled and maintained between 37% and 45% all year long. To achieve this, a humidifier or a dehumidifier must be used, depending on the season.

If engineered wood flooring is to be installed on radiant heating, first ensure that a heat and leak test has been carried out and the system has been turned on and off a number of times over a period of several weeks prior to installation of the flooring. The heating system must be turned off and room temperature must be reached before installing the flooring. Once the installation is completed, gradually increase the heat temperature by 3 °C (5.4 °F) per day until the desired temperature is reached. The surface temperature of radiant heating system must never exceed 28 °C (82.4 °F).

Given certain physical properties of Jatoba (Brazilian cherry) and Tigerwood (Muiracatiara), the installation of these species on radiant heating is not recommended and therefore not covered by warranty.

There are four standard methods of installing engineered wood flooring on a radiant heating system.

The first method consists of installing the engineered flooring boards on a 5/8 in (1.6 cm) plywood subfloor covered with vapour barrier paper resistant to above-normal temperatures, 30 °C (85 °F). The plywood is screwed into place on the floor joists between which the radiant heating is installed.

The second method is used when flooring is to be installed on an existing floor, or when it is impossible to install the radiant heating system between the joists. This method consists of installing the engineered flooring on a new 5/8 in (1.6 cm) plywood subfloor covered with vapour barrier paper and supported by the ledger strips screwed to the old flooring. The radiant heating system is installed between the ledger strips.

The third method is used to create more constant heating. First, a coat of cement is laid between the ledger strips over the radiant heating coils. Then a 5/8 in (1.6 cm) plywood subfloor covered with vapour barrier paper is installed before installing the flooring boards.

The fourth method involves installing the flooring boards on a radiant heating system installed directly in a concrete slab in a basement or in a building with concrete floors. A subfloor consisting of 1/2 in (1.3 cm) sheets of interlocking plywood covered with vapour barrier paper is then installed directly on the concrete. This type of installation is often referred to as a floating floor.