INSTALLATION GUIDE

TruBalance Lite/ Northern Solid Sawn® Lite TECHNOLOGY

1-800-463-1303
1-877-256-0231 (Vintage)

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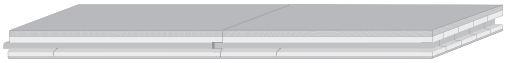
1. INTRODUCTION

Please read all instructions carefully before installation. Improper installation may void the warranty.

PRODUCT USE



Recommended Installation

MIRAGE's TruBalance Lite/Northern Solid Sawn Lite products may either be ❶ glued down over plywood/OSB or concrete subfloor or simply ❷ nailed/stapled down over plywood/subfloor, using a specially designed hardwood floor stapler or nailer or ❸ floated over a recommended underlayment. However, an exception applies to our Herringbone flooring pattern. Please refer to the Herringbone Installation Guide in the Guides and Support section online.

Our wood species can be installed over subfloors equipped with radiant heat systems, except for Hickory, which is not allowed for use over radiant heat.

INSTALLER AND OWNER RESPONSIBILITY

Prior to installation, both the installer and the owner must verify that the work environment conditions and subfloors meet or exceed the minimum requirements specified in this installation guide.

Standard trade practice allows for up to a 5% margin of error for natural imperfections and manufacturing defects. Before installation begins, the installer and the owner are responsible for performing a final inspection of the flooring to confirm that the grade, color, manufacturing quality, and finish are acceptable and consistent with the product purchased.

Once installation has started, all boards are deemed to have been accepted by both the installer and the owner, even if the owner is not present during the installation. When calculating the quantity of hardwood flooring to order, it is recommended to include additional material to account for cutting waste.

WARRANTY

Structural Lifetime Warranty

Structure

STRUCTURAL LIFETIME LIMITED WARRANTY

ALL OUR FLOORS COME WITH A STRUCTURAL LIFETIME LIMITED WARRANTY.

Finish Warranty

Residential (Light commercial) Finishes

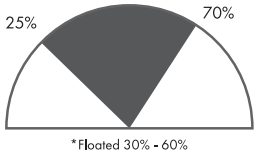
35-YEAR WARRANTY

ON FINISH WEAR-THROUGH FOR RESIDENTIAL APPLICATIONS.

3-YEAR WARRANTY

AGAINST WEAR OF FINISH FOR LIGHT COMMERCIAL APPLICATIONS.

Relative Humidity



To be eligible to file a warranty claim, surface wear must be readily visible and cover at least ten percent (10%) of the total flooring surface area.

Disclaimer

- The nature of Character grade flooring explains the appearance of certain characteristics visible at time of purchase or developing over time, including pronounced color variations, open and closed knots, mineral streaks, cracks, surface holes, and other character or milling marks are part and parcel of this effect.
- Some distinctive marks may become prominent over time due to changes in the environment.

For more information on the warranty or for information on floor care prevention, consult the MIRAGE Warranty Certificate and the MIRAGE's Residential Maintenance. In the event of a discrepancy between the information in the Installation Guide and the MIRAGE Warranty Certificate, the latter shall prevail.

MIRAGE Group, Technical Service
1255, 98th Street, Saint-Georges (Quebec) Canada G5Y 8J5
MIRAGE Technical Service Department 1-800-463-1303
Vintage Technical Service Department 1-877-256-0231
Or by email: technical@miragefloors.com

2. TOOLS

RECOMMENDED TOOLS, MATERIAL AND ACCESSORIES

- Vacuum cleaner or broom
- Scraper
- Leveling bar
- Level
- Leveling compound (optional)
- #20 grit sandpaper (optional)
- Wood and/or concrete moisture meter
- Miter saw
- Handsaw
- Security glasses
- Trowel
- Claw hammer
- Nail punch
- Pry bar
- Square 16" x 24"
- Measuring tape
- Chalk line
- Reversing tongues (optional)
- Repair Kit
- *KLEAN by mirage* (maintenance kit)

GLUED DOWN INSTALLATION

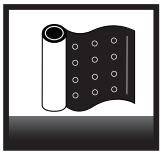
For guidance on recommended adhesives that meets MIRAGE's performance criteria, refer to Technical Newsletter #23, available in Appendix 5.2.

- Trowel recommended by adhesive manufacturer as tooth size is important for ensuring optimal strip adherence to subfloor.
- 2" (50 mm) concrete nails and 1" x 3" x 8' (25 mm x 75 mm x 245 cm) laths for first-row holding block.
- 3M blue adhesive tape or easily removable equivalent.
- 100 to 150 lbs (45 to 68 kg) pound roller.
- Remover towels for hand and tool cleaning.
- Adhesive cleaner.
- Recommended underlayment if necessary. Refer to Technical Newsletter #26, available in Appendix 5.3.

NAILED/STAPLED DOWN INSTALLATION

Consult Technical Newsletter #30 in Appendix 5.4 for detailed specifications and selection criteria for approved fasteners (nails and staples).
For glue assist installation requirements and product limitations, refer to Technical Newsletter #36, available in Appendix 5.6.

- Pneumatic staplers/nailers.
- Power drill and 3/32" (2 mm) bit.
- Finishing nails: 2-1/2" (63 mm).
- Flooring screws.



FLOATED INSTALLATION

For the detailed installation requirements and products limitations, refer to Technical Newsletter #20, available in Appendix 5.1.

- Recommended underlayment.
- Use a wood glue with a sufficiently thick consistency that retains flexibility for optimal adhesion. Consider the following options:
  - Carpenter's glue of a trusted brand that meets the CSA 0112.4 standard (avoid using multi-purpose glue).
  - Type 2 wood glue (such as carpenter's glue, enhanced PVA glue, etc.). Please refer to adhesive manufacturer for detailed mechanical properties.
- Waterproof adhesive tape (3M tape).

Note: MIRAGE cannot be held responsible for any floor damage resulting from use of inadequate fasteners or adhesive, differing from those recommended. All the installation material must be at the recommended room temperature prior to the installation ± 72 °F (± 22 °C).

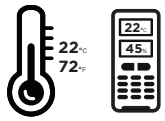
3. PREPARATION

HANDLING AND ACCLIMATIZATION

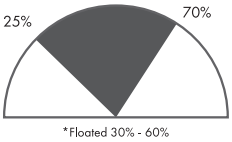
Prefinished hardwood floor installation **requires a little more time and precaution than unfinished flooring**; handle with care to avoid board surface and finish damage.

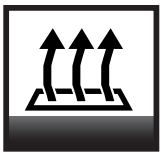
PRE-INSTALLATION CHECK LIST

Basic requirements



- Hardwood floor installation should be the very last step of any construction or renovation project.
- Prior to installation, heating system must be in operation, and room temperature must have been maintained at ± 72 °F (± 22 °C) for at least one week.
- To avoid any moisture-related damages, subfloor must be dry and basement well ventilated.
- For below grade installation, ensure that foundations, concrete slab or any adjacent objects are thoroughly leakproof.
- Relative humidity must be maintained around ±45% at all times. For glued down and nailed/stapled down installation, relative humidity must always be maintained within a range of 25% and 70%. For floated installation, it must be maintained between 30% and 60%.





Radiant heat performance:

- Refer to Technical Newsletter #31, available in Appendix 5.5 for recommendations on radiant heat systems.

Subfloor moisture level check

Wooden subfloor: Wooden subfloor moisture reading must not exceed 12% and differential between boards and subfloor must be less than 4%. Wood moisture meters are available from your Mirage Authorized dealer. If moisture reading is too high, postpone installation, find moisture source and correct it if needed. Raise heat and increase ventilation until proper conditions are met.

Concrete subfloor: Prior to installation, concrete subfloor should preferably be 45 to 90 days old, **30 days being the absolute minimum.** Concrete moisture meter must be used to check subfloor moisture level; if the result exceeds 3.5%, calcium chloride test must be performed. **The concrete subfloor moisture content must not exceed 3 lbs / 1,000 sq. ft. /24 hours**. If the reading exceeds 3 lbs, use a complete moisture-proofing system (sealer and adhesive) compatible with the selected adhesive. Please refer to the manufacturer's documentation for the selected products for information on their warranty, product limitations, and installation recommendations.

Product Temperature

Note: Keep wood flooring boxes unopened in the room where the flooring will be installed for at least 24 hours prior to installation to allow the material to acclimate to ambient temperature. Open boxes only at the time of installation.

Owner and installer are solely and jointly responsible for pre-installation subfloor moisture level check and must ensure that all conditions and/or specifications listed in this guide have been thoroughly met prior to installation of hardwood floor.

SUBFLOOR PREPARATION

- Stapled down installation requires minimum 5/8" (16 mm) plywood, or 23/32" (18 mm) OSB chipboard subfloor.
- **Sound:** Wooden subfloor must be securely screwed down to joists to prevent any movement or squeaks. Thoroughly inspect and replace existing floor or subfloor that shows evidence of water damage or structural weakness. Snow and rain during construction could affect negatively some properties especially on OSB. Concrete subfloor must be just as structurally sound before installing hardwood floor and should be rated with a minimum compressive strength of 3000 psi.
- **Flat:** The subfloor surface must be flat. For glue down or nailed/stapled installation, the maximum tolerance is 3/16" (5 mm) over a 10 ft (3 m) span. For floated installation, the maximum tolerance is 3/32" (2 mm) over a 7 ft (2 m) span. To check the surface, use a rigid straight ruler and continuously measure (at all points) the entire subfloor in all directions (360 degrees). Correct deviations by flattening high points with a suitable tool and filling in low points with an appropriate filler to meet the required tolerances.
- **Level:** The subfloor must be level. Any deviation should be minimal, barely noticeable to the naked eye. Some standards suggest a maximum deviation of 1/2" (13 mm) over a 10 ft (3 m) span. It is important to note that leveled installation of items such as cabinets, decorative frames, and windows impact the visual perception of levelness and the overall visual appeal for the end user.
- **Dry:** Subfloor must be dry and within moisture reading specs.
- **Clean:** Vacuum and free subfloor from any debris or obstacles such as cleats, nail heads, dried glue or any other material.

PREPARATION BEFORE FLOORING INSTALLATION

- Sketch installation to avoid surprises.
  - Decide starting point or wall.
  - Decide layout angle.
- Remove any baseboard, doorsill and old floor covering if necessary.
- Trim bottom of the doorstop with handsaw to insert boards underneath.
- To enhance the floor's look, use several boxes at once and mix boards to ensure variations in color, shade and length.
- Start by selecting the boards that will best go with the transition moldings.

4.1 GLUED DOWN INSTALLATION

GLUED DOWN INSTALLATION INSTRUCTIONS (Illustration #1)

Wear security equipment and maintain a safe environment at all times.

Step 1: Starting point

- Using a chalk line, make a starting mark Ⓐ parallel to starting wall Ⓑ. The distance from the parallel wall and the starting line is based on the board widths. See the table below.

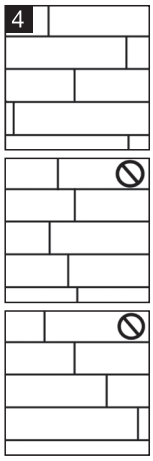
Board widths	Distance between wall and starting line
5" (127 mm)	30-1/4" (768 mm)
7" (177 mm)	35-1/8" (891 mm)

- Working area Ⓒ between starting wall and starting line, will be last floor section laid. Above measurements account for ideal fit, so that it will not be necessary to rip saw finishing board row, while allowing for required 1/4" (6 mm) expansion Ⓓ gap.
- Holding block Ⓔ, must be nailed down alongside starting line inside working area to secure starting row in place.

Step 2: Adhesive application (Technical Newsletter #23)

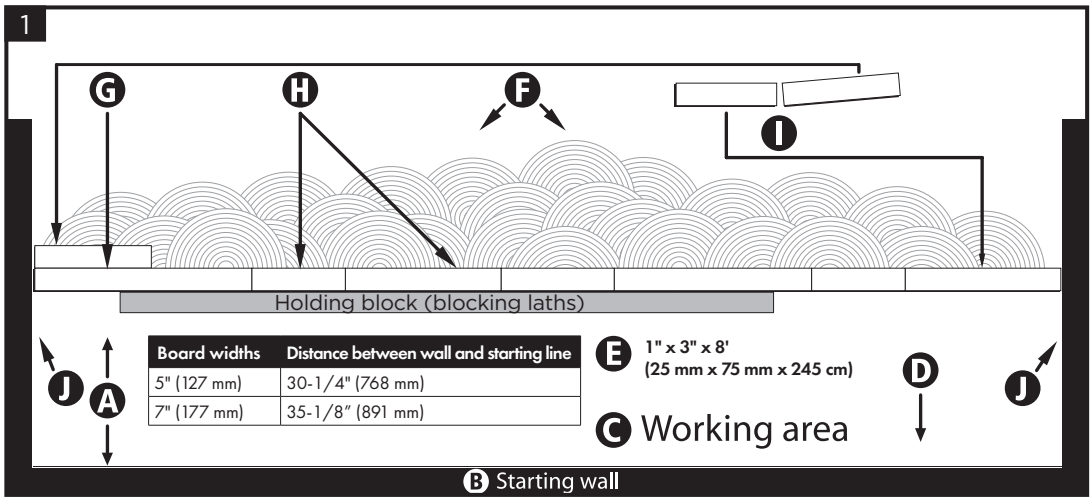
- For optimal adhesive application, work trowel Ⓕ in circular motion at 45° angle; adhesive left on floor by trowel teeth is just the right amount. (One gallon covers about 45 to 50 sq. ft. depending on manufacturer's specs. See container.)

Note: Only cover surfaces that can be reasonably laid in two hours, since adhesive may dry too quickly and not stick properly. Reaction time may vary from one adhesive to another and may also be affected by room temperature and relative humidity (see manufacturer's specs on container).



Step 3: Board laying

- It is very important that installation be started straight and square.
- Carefully select boards. As needed, cut boards that appear different or move them to a less visible location.
- Laying from working area, leave 1/4" (6 mm) gap alongside left wall which is perpendicular to starting line, prop tongue side against holding block and press first board Ⓖ down into adhesive.
- Install subsequent boards, Ⓗ proceeding from left to right until ready to trim first-row end board.
- To minimize trim waste, select board long enough Ⓘ for row end, so that remaining trimmed end may be used to start subsequent row. Leave 1/4" (6 mm) gap at end of each row Ⓘ.
- First board of second row must be at least a plank-width shorter or longer than that of first row. Cross joints must be staggered by at least a plank-width from one row to the next. Avoid lining the joints up or having them follow too regular a pattern (Illustration #4).
- Insert tongue end into board groove, lower board as close as possible to adjacent one, slide tongue into groove and press board down.
- Proceed the same way for subsequent rows.
- Once main part of floor has been laid, remove blocking laths from working area and complete installation in the same manner. Use pry bar to fit last row of boards into place and be sure to leave minimum required 1/4" (6 mm) expansion gap.



4.1 GLUED DOWN INSTALLATION

Notes:

- When used, acoustic underlayment must be glued down over subfloor prior to gluing down boards using the same recommended adhesive (Technical Newsletter #26).
- Extremely precise board 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 boards in place and avoid board movement causing gapping during installation, use 3M blue adhesive tape.
- For better board contact with adhesive, it is recommended to use adhesive manufacturer's recommended pound weight roller (usually 100 to 150 lbs / 45 to 68 kg required) over laid floor section **before adhesive dries.** Use roller's protective padding to avoid damage to floor surface.

Step 4: Accessories installation

- If applicable, install transition moldings, stair nosings and reducers.
- If applicable, reinstall baseboards and quarter rounds, making sure to nail them only to walls and not to floor (to allow free floor movement).

Step 5: Post-installation

- Wait 24 hours before moving furniture back into place or allowing heavy traffic.
- Set a few boards aside in case of future repairs.
- When installation is completed, vacuum floor thoroughly, spray light mist of *Klean by mirage™* Cleaner on terry cloth mop and clean floor.

4.2 NAILED/STAPLED DOWN INSTALLATION

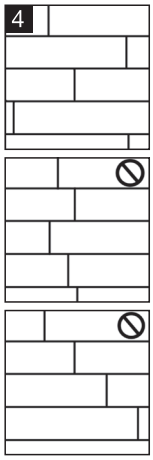
NAILED/STAPLED DOWN INSTALLATION (Illustrations #2 and #3)

Wear security equipment and maintain a safe environment at all times.

Step 1: Starting point

- Using a chalk line, make a starting mark Ⓐ parallel to starting wall Ⓑ. The distance from the parallel wall and the starting line is based on the board widths. See the table below.

Board widths	Distance between wall and starting line
5" (127 mm)	5-1/4" (133 mm)
7" (177 mm)	7-1/4" (183 mm)



Step 2: Board laying

- It is very important that installation be started straight and square.
- Carefully select boards. As needed, cut boards that appear different or move them to a less visible location.
- Align first board tongue side with starting Ⓐ line, grooved side facing starting wall; leave 1/4" (6 mm) gap from right side Ⓔ wall which is perpendicular to starting line. Drill and nail board vertically Ⓒ as close to wall as possible to hide nail heads when baseboards and quarter rounds Ⓓ are in place. Install subsequent boards from right to left until ready to trim row end board.
- To minimize trim waste, select board long enough for row end, so that remaining trimmed end may be used to start subsequent row. Leave 1/4" (6 mm) gap at end of each row Ⓔ.
- First board of second row must be at least a plank-width shorter or longer than that of first row. Cross joints must be staggered by at least a plank-width from one row to the next. Avoid lining the joints up or having them follow too regular a pattern (Illustration #4).
- Since wall proximity prohibits use of stapler, use finishing nails approximately every 4" (100 mm) alongside tongue Ⓕ for first few rows, and punch nail heads down.
- Subsequent rows must be installed the same way, using the stapler. Staple boards every 4 to 6" (100 to 150 mm), and must have a fastener (staple) between 2 and 3" (50 and 75 mm) on the ends of each board.
- Because of wall proximity, installation of last 4 or 5 rows is identical to installation of first few rows. You might have to rip-saw last row of boards to leave required 1/4" (6 mm) gap Ⓑ alongside finishing wall.

Note: Extremely precise board milling may require use of tapping block for better tongue and groove fit.

Step 3: Accessories installation

- If applicable, install transition moldings, stair nosings and reducers.
- If applicable, reinstall baseboards and quarter rounds, making sure to nail them only to walls and not to floor (to allow free floor movement).

Step 4: Post-installation

- Set a few boards aside in case of future repairs.
- When installation is completed, vacuum floor thoroughly, spray light mist of *Klean by mirage*™ Hardwood Floor Cleaner on terry cloth mop and clean floor.

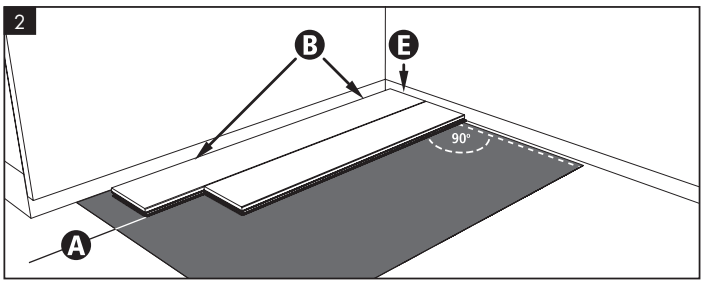
For more information on floor care, consult the **MIRAGE's Residential Maintenance**.

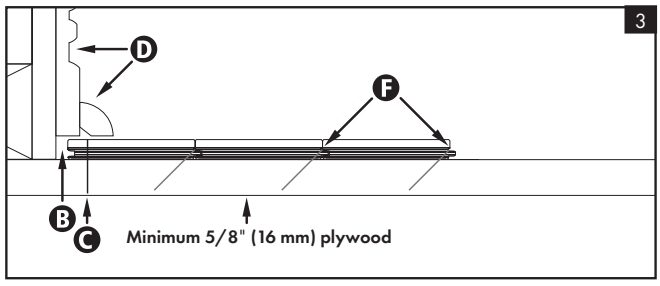
PNEUMATIC STAPLER TIPS

Warning

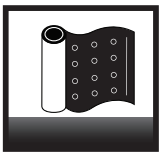
To avoid damaging boards during installation:

- Ensure that stapler/nailer base plate remains clean and free from nicks at all times.
- When stapler/nailer is not being used, place on piece of plywood or cardboard, but never directly onto floor.
- Ensure that stapler/nailer base sits flat on floor and plumb against tongue before stapling board down.
- **Check base plate condition and proper operation of nailer/stapler regularly**.
- Set and check air pressure regularly on subfloor types requiring specific air pressure settings.





4.3 FLOATED INSTALLATION

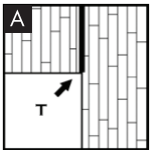


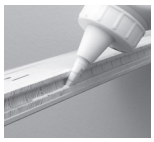
FLOATED INSTALLATION

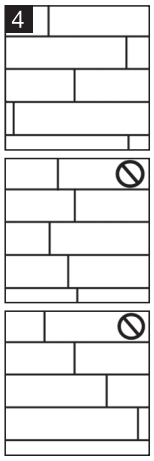
Step 1: Underlayment (Technical Newsletter #20)

The recommended underlayment is required when MIRAGE TruBalance Lite/Northern Solid Sawn Lite is floated. For more details, please contact our Technical Service Department at 1-800-463-1303 or 1-877-256-0231 (Vintage).

- Cover all of the subfloor as well as the base of the walls (approx. 2" (51 mm)) with the recommended underlayment. Place the underlayment in the opposite direction to the boards, which is to be installed without overlapping.
- Use waterproof tape to attach the strips on the each side.
- Consult the documentation that comes with the recommended underlayment for installation instructions.







Step 2: Starting point

No part of the floor must be attached to any surface. A minimum 1/2" (13 mm) space must be left for expansion around all room fixtures (walls, moldings, columns, pipes, steel door frames, kitchen island cabinets, heavy objects, etc.). Attach buffers to each wall to ensure enough space is left. If a room exceeds 40' (12 m) width or 66' (20 m) length, use a "T" molding to increase the space required for the expansion gap. In irregularly shaped spaces (L-, F-, T-, or U- shaped), use a "T" molding for intersections (Illustration A).

- While facing the wall, start on the left corner leaving a gap at both walls with the tongue facing you. Leave a 1/2" (13 mm) gap between the wall and the edge of the board.
- Apply a recognized carpenter's glue that meets CSA 0112.4 or Type 2 wood adhesive standards to all side joints, as gluing side joints is required. End joints may also be glued if desired using the same adhesive.(Please refer to the adhesive manufacturer for the mechanical properties of the glue). Apply the glue on the top corner of inside groove only. Flip the board, as shown on the picture, to make it easier.
- Moving right, put the next board in place. Sliding vertically, insert the end tongue into the end groove of the first board. Continue in this way until it is time to cut the last board to finish the first row.
- The board chosen to finish the first row should be long enough to start the second row with the trimmed end, so as to minimize trim waste.
- Leave a gap for the board to expand in all directions.
- Start the second row with the trimmed end of the board. It should be at least a plank-width longer or shorter than the board used in the first row.
- Cross joints must be staggered by at least a plank-width from one row to the next. Avoid lining the joints up or having them follow a too regular pattern (Illustration #4).
- It is recommended to use 3M blue tape to hold the flooring in place (X pattern to prevent shifting) until the adhesive has completely dried. Straps can also be used to hold the flooring in place.
- Any excess glue should be cleaned off the surface of the floor immediately as flooring is being installed.
- As the floor can still be moved after the third row has been installed, it is recommended that you measure and realign with buffers, if necessary.
- The boards on the last row must be at least 1-1/2" (38 mm) wide. Remember to leave a gap for the expansion space.

Step 3: Accessories installation

- If applicable, install the transition moldings, stair nosings and reducers.
- Remove the buffers.
- Reinstall the moldings and quarter rounds as required, through the underlayment. Nail them to the walls and not to the floor, so that the floor can move naturally.
- Cut the underlayment that goes beyond the moldings.

Step 4: Post-installation

- Set a few boards aside in case future repairs are required.
- When installation is completed, vacuum the floor thoroughly, spray a light mist of *Klean by mirage*™ Cleaner on a terry cloth mop and clean the floor.

For more information on floor care, consult the **MIRAGE's Residential Maintenance.**

APPENDIX

5.1 Technical Newsletter #20

Issued: February 2, 2009
Revised: February 2, 2026

Technical Newsletter #20 2.0

Subject: MIRAGE's floated installation specifications

The goal of this technical newsletter is to review the allowed widths by technology, the waterproof acoustic underlayments and the minimum parameters needed to maintain the MIRAGE flooring lifetime structural warranty.

Allowed widths by technology for floated installation:

Technology	Width	Floated installation
TruBalance/Northern Solid Sawn 3/4" (19 mm)	5" to 7-3/4"	Allowed
	9"	Not allowed
TruBalance Lite/Northern Solid Sawn Lite 9/16" (14 mm)	5" & 7"	Allowed
	≥ 8-3/4"	Not allowed
Lock 7/16" (11 mm)	All	Allowed

Membrane criterias:

When installing specified MIRAGE floors with floated installation, we recommends using AcoustiTECH underlayment distributed by MIRAGE.

For greater flexibility in selling MIRAGE products, you may also use other underlayments. However, they have to meet the following minimum criteria:

	Minimum criteria	Limit and comment	Standard
A	Compressibility at 25% deflection **or**	**≥ 6 psi** if between 1 mm and 2.5 mm thick	ASTM D-3575
		≥ 8 psi if between 2.6 mm and 3.5 mm thick	
	Maximum Deflection @ 5 psi of load *test done on one underlayment only*	**≤ 0.6 mm**	ASTM D-3575 (modified)
B	Maximum service temperature	**120°F [50 °C]**	
C	Thickness	**≤ 3.5 mm**	
D	Water vapor transmission [**WVT**]	**≤ 0.6 lb/1,000 sq. ft. /24 hrs**	ASTM E-96

MIRAGE Technical Service Department 1-800-463-1303
Vintage Technical Service Department 1-877-256-0231
technical@miragefloors.com

5.1 Technical Newsletter #20

IMPORTANT NOTE:

Once you have selected your underlayment, MIRAGE cannot be held responsible and makes no guarantees whatsoever regarding:

1. The underlayment manufacturer's long-term warranty
2. The acoustic performance of the underlayment or the floor assembly
3. The chemical composition of the underlayment (VOCs, formaldehyde, or other products)
4. Problems installing the underlayment or its accessories
5. The underlayment supplier's claim management process
6. A underlayment that compromises the stability of the floor due to a slippery top layer causing floor displacement in some areas **The use of installation springs (specially designed for floating products) can help reduce some floor movement.

When you select an underlayment, the manufacturer must guarantee in writing that the underlayment meets all the minimum criteria [A, B, C and D, if waterproof] recommended by MIRAGE. The underlayment manufacturer must also assume sole responsibility for meeting the above-mentioned parameters [1 to 6].

Choosing the right underlayment is a critical step in ensuring the short- and long-term integrity of your MIRAGE floor assembly. Using an underlayment that does not meet the above criteria or that causes any damage to the floor automatically invalidates the lifetime structural warranty on the installed MIRAGE product.

5.2 Technical Newsletter #23

Issued: January 21, 2009
Revised: February 2, 2026

Technical Newsletter #23 2.0

Subject: Minimum criteria regarding adhesives to use

The goal of this technical newsletter is to review the minimum requirements for ensuring the long-term performance of adhesives used with specified MIRAGE floors.

Users are responsible for ensuring that the adhesive they select meets the requirements mentioned below. MIRAGE cannot be held responsible and makes no guarantee whatsoever with regards to:

1. The consistency of the adhesive's properties
2. The adhesive's chemical composition (VOCs, formaldehyde, or other products)
3. Issues with adhesive application or cleaning
4. The adhesive company's claim management process

When you select an adhesive, the manufacturer must guarantee in writing that the adhesive meets all the minimum criteria recommended by MIRAGE. The adhesive manufacturer must also assume sole responsibility for meeting all criteria mentioned in this document.

Warranty exclusions are the following: any flooring deficiencies stemming from the application method or the adhesive itself, as adhesives can damage the finish under certain conditions.

Choosing the right adhesive is a critical step in ensuring the long-term integrity of your floor.

Criteria	Standard	Specification	Benefit if criteria is met
Water content		0%	To avoid water damage and not compromise installation
▲ Green grab		Holds ridges High initial grab	To hold product on uneven subfloor To facilitate installation, avoid floor/board misalignment
■ Shear strength	EN 14293	72 psi (0.5 Mpa)	To ensure good bonding and performance
■ Elongation at break	EN 14293 (modified)	Between 40 and 400%	To allow appropriate expansion
■ Tensile strength	EN 14293	90 psi (0.6 Mpa)	To ensure good bonding and performance
OR			
■ Tensile strength	ASTM D-412 (method a)	72 psi (0.5 Mpa) (7-day cure)	To ensure good bonding and performance
■ Elongation at break	ASTM D-412 (method a)	Between 40 and 400%	To allow appropriate expansion
■ Creep of an assembly[1] (tensile or shear)	EN 14293 (modified) or Lap shear or Equivalent standard	Max. 1 mm elongation (at loading) 30 psi (0.2 Mpa) loading (30 min.) (7 day cured assembly)	To avoid buckling, excessive expansion, or performance problems To ensure long term performance/stress resistance
Adhesive transfer		> 80%	To ensure good bonding
		100%	If used as a vapor barrier, please see manufacturer instructions
▲ Curing time		Max. 24 hrs	Excessively long cure times can lead to installation issues
Service temperature		20 to 110°F (-6 to 43°C)	To sustain variable temperature and radiant heat systems
Warranty		Lifetime	To match MIRAGE warranty

▲ *Impacted installation (time required and/or ease of installation)*

■ *Properties that have an impact on product performance (expansion, cupping)*

Note: ASTM D-412 and EN 14293 do not necessarily correlate.

The following points can't be managed by MIRAGE but are critical when choosing an adhesive:

- Spread rate[2] (adhesive consumption)
- Underlay compatibility
- Subfloor compatibility
- Warranty exclusions
- Concrete sealer system: meets 3 lb./1,000. sq. ft /24 hrs
- Resistance to moisture/alkalinity (in concrete)
- Sealer/adhesive compatibility (refer to manufacturers)

[1] *Assembly: typical wood or concrete floors (or similar to concrete)*

[2] *Note that the required spread rate for 3/4" or 9/16" thick hardwood floors is equivalent to the 1/2" thick. For 3/4" or 9/16" thick flooring installation, we recommend using the same trowel designed for 1/2" thick hardwood floors. Refer to glue manufacturer for trowel's recommendations & requirements according to 1/2" thick hardwood floors. It is important to choose the trowel based on installation site characteristics such as subfloor flatness in order to obtain a minimal transfer of 80%, this criteria being predominant.*

MIRAGE Technical Service Department 1-800-463-1303
Vintage Technical Service Department 1-877-256-0231
technical@miragefloors.com

Issued: January 31, 2011
Revised: February 2, 2026

Technical Newsletter #26 3.0

Subject: Underlay (soundproofing) criteria for glued down installation with specified MIRAGE products

The goal of this technical newsletter is to review acoustic underlayments and the minimum criteria needed to maintain specified MIRAGE products lifetime warranty.

For acoustical reasons, you can install specified MIRAGE floors glued to an underlayment.
However, the pad/assembly must meet the following minimum criteria:

	Criteria	Standard	Limit	Note
Underlay only	**Compression @ 25% deflection**	**ASTM D-357**	**≥ 2 psi** thickness less than 7 mm **≥ 6 psi** thickness between 7 and 10 mm	To avoid movement (comfort and squeaking) 10 mm is the maximum thickness
	Tensile @ 100% elongation or less	**ASTM D-412** (method A) or equivalent	60 psi (min. 0.4 Mpa)	To limit expansion/contraction and to ensure wear resistance of underlayment
	Adhesive transfer to flooring	N/A	75%	To ensure proper adhesion
	Service temperature		20 to 110°F (-6 to 43°C)	To sustain radiant heat systems
	Water vapor transmission	**ASTM E-96**	Min. 0.6 lb./1,000 sq. ft./24 hrs	To be considered a moisture vapor protection

Underlayment: Do not confuse with vapor resistant/barrier products designed for concrete or wooden subfloors.

Typical assembly*	**Tensile** (perpendicular to gluing plan)	**EN 14293** (or equivalent)	50 psi [0.35 Mpa] (7-day cure) Max. 4 mm @ 50 psi (0.35 Mpa)	This value is not a percentage, in order to avoid thickness affecting results
	Creep (tensile) (perpendicular to gluing plan)	**EN 14293** (or equivalent)	Max. 2 mm (from loading) Loading 30 psi (0.2 Mpa) 30 minutes load	To limit expansion/contraction and excessive deformation

Typical assembly* *: subfloor + adhesive + underlay + adhesive + installed floor. Both underlayment and adhesive effects should be considered to ensure good product performance.*

***Note 1**: The acoustical performance of the underlayment is dependent on the construction where it is used. The subfloor can impact performance of the underlayment.*

Important notes:

- All the criteria must be met to ensure proper performance of the product.
- The adhesive used must meet the standards set out in Technical Newsletter #23.

MIRAGE will not be held responsible for:

- The acoustical performance of the underlayment used (see note 1)
- The long-term resistance to wear (moisture, mildew)
- The content of the underlayment (raw materials, adhesives, contaminants, VOCs or formaldehyde content)
- The compatibility with sealants or adhesives (according to manufacturer)
- The warranty (should be at least equal to MIRAGE flooring)
- Any problems related to the use and installation of the underlayment or accessories

MIRAGE Technical Service Department 1-800-463-1303
Vintage Technical Service Department 1-877-256-0231
technical@miragefloors.com

Issued: January 12, 2012
Revised: February 2, 2026

Technical Newsletter #30 2.0

Subject: Criteria for selecting fasteners (nails and staples) to install MIRAGE flooring

This newsletter provides the criteria for choosing the right nails and staples to install MIRAGE flooring as well as a few rules of thumb to ensure the installation is just right.

Fastener selection criteria

Product	Fastener gauge		Minimum length	Space between fasteners	Distance of fastener from the ends
	U-shaped staple	L- or T-shaped nail			
TruBalance/ Northern Solid Sawn 3/4" (19 mm)	Min.: 18 ga Max.: 15,5 ga	Min.: 18 ga Max.: 15,5 ga	1-1/2" (38 mm)	4 to 6" (100 à 150 mm)	Between 2" and 3" (50 and 75 mm)
TruBalance Lite/ Northern Solid Sawn Lite 9/16" (14 mm)	Min.: 19 ga Max.: 18 ga	Min.: 20 ga Max.: 18 ga	1-1/4" (32 mm)	4 to 6" (100 à 150 mm)	Between 2" and 3" (50 and 75 mm)
Solid 3/4" (19 mm)	Min: 17 ga Max: 15,5 ga	Min: 18 ga Max: 15,5 ga	1-3/4" (44 mm)	6 to 8" (150 to 200 mm)	3" (75 mm)
Engineered 1/2" (13 mm)	Min: 19 ga Max: 18 ga	Min: 20 ga Max: 18 ga	1-1/4" (32 mm)	4 to 6" (100 to 150 mm)	Between 2" and 3" (50 and 75 mm)

Fasteners (nails and staples)
Make sure each fastener is placed in exactly the right spot. If it's off just a few millimeters, the surrounding wood fibers will be subjected to excessive pressure and stress.
- Fasteners should be driven in at a 45° angle.
- Fastener heads should be positioned in the provided slot in the board.
- Fasteners should not be driven too deep into the tongue and should not interfere with board positioning on the next row.

Tool maintenance
Installation tools should be regularly inspected and maintained to avoid any damage.
- The tools should not damage board sides or tongues.
- Tools may need to be adjusted for proper positioning.
- Striking force and/or air pressure may need to be adjusted for proper anchoring.

Notice
Install a vapor retardant if required. Please refer to our Technical Newsletter #27 for more information. Local building codes do prevail over any guidelines including any installation instructions supplied by the manufacturer.

Do not use a compressible acoustic underlay pad since it would create excessive noise when used with a mechanical fastener.

Installing floors with nails or staples may lead to slight shifting, causing creaking. Minor dimple effect near the fasteners is also normal. Using a fastener gauge of 18 ga could reduce this phenomenon.

MIRAGE will not accept any claims for damage caused by the use of improper or defective installation tools.

MIRAGE Technical Service Department 1-800-463-1303
Vintage Technical Service Department 1-877-256-0231
technical@miragefloors.com

Issued: January 27, 2014
Revised: February 2, 2026

Technical Newsletter #31 5.0

Subject: Radiant heating systems recommendations

MIRAGE knows there are a lot of different radiant heating systems available on the market. Based on tests carried out by the MIRAGE R&D team to evaluate some of the systems in terms of risk regarding platforms and installation methods, this technical newsletter will review the recommendations MIRAGE has regarding the installation of a radiant heating system, the type of system that is allowed to install depending on the floor technology and installation method, and the exclusions.

Here are some general recommendations:

- Make sure to use adhesives recognized by the radiant heating system manufacturer's and by MIRAGE Technical Newsletter #23.
- Make sure the wood surface temperature never exceeds 80 °F (27 °C) and not vary from any point by more than 3 °F (2 °C).
- MIRAGE recommendations should never overpass the radiant heating system manufacturer's instructions.
- Make sure the radiant heating system has been tested and in operation for a week prior to the floor installation. The system temperature should be lowered during installation.

Please find below which type of system is allowed to be installed depending on the floor technology and installation method.

	Type of technologies and installation methods		
Type of radiant heating systems	**Gluing**	**Floating[1]**	**Nailing[2]**
	TruBalance/ Northern Solid Sawn TruBalance/ Northern Solid Sawn Lite Engineered Lock	TruBalance/ Northern Solid Sawn TruBalance/ Northern Solid Sawn Lite Lock	TruBalance/ Northern Solid Sawn TruBalance/ Northern Solid Sawn Lite Engineered
Pipes or electric grid embedded in concrete (slab or thin layer of gypcrete/light concrete)	✓	✓	N/A
Pipes in grooved wooden panels (not covered on top)	✓	✓	Please refer to the Technical Newsletter #36, method 4 with at least 2 beads.
Uncovered pipes in grooved wooden panels with aluminum/metal plated	✓	✓	Please refer to the Technical Newsletter #36, method 4 with at least 2 beads.
Pipes covered with dissipating aluminum/metal plates and/or wooden panels (also dissipating plates between pipes)	✓	✓	Please refer to the Technical Newsletter #36, method 4 with at least 2 beads.

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MIRAGE Technical Service Department 1-800-463-1303
Vintage Technical Service Department 1-877-256-0231
technical@miragefloors.com

5.5 Technical Newsletter #31

Type of radiant heating systems	Type of technologies and installation methods		
	Gluing	**Floating**[1]	**Nailing**[2]
	TruBalance/ Northern Solid Sawn TruBalance/ Northern Solid Sawn Lite Engineered Lock	TruBalance/ Northern Solid Sawn TruBalance/ Northern Solid Sawn Lite Lock	TruBalance/ Northern Solid Sawn TruBalance/ Northern Solid Sawn Lite Engineered
Pipes or electrical system fixed under the subfloor (in joist system)	✓	✓	Please refer to the Technical Newsletter #36, method 4 with at least 2 beads.
Semi-conductive types of polymers or "heating mat" (all the surface of the panel/mat is heating)	✓	✓	N/A
"Metal heating foil" not attached to subfloor	✗	✓	N/A
Electrical wire system attached or not to a "neutral support"	✓[3]	✓	N/A

✓ *Allowed*
✗ *Not allowed*

Exclusions
Based on tests carried out by the MIRAGE R&D team regarding the performance of Solid technology floors and all Hickory floors over radiant heat, and based on the National Wood Flooring Association statement that radiant heating installations using denser species are less stable, MIRAGE does not allow these products to be installed over this type of system.

If you need more information or have any questions, please feel free to contact our Technical Service Department.

[1]*Using a recommended membrane following Technical Newsletter #20, with TruBalance/Northern Solid Sawn, TruBalance Lite/Northern Solid Sawn Lite or Lock product only.*

[2]*We understand that some system can be covered by a wood panel to allow nailing (even if embedded in concrete for example). Nailing installation is not preferred since it could lead to more floor movement and risk of system damage.*

[3]*Wire diameter and spacing should lead to an 80% glue transfer to be a valid installation. Trowel and adhesive coverage could vary.*

MIRAGE Technical Service Department 1-800-463-1303
Vintage Technical Service Department 1-877-256-0231
technical@miragefloors.com

5.6 Technical Newsletter #36

Issued: June 10, 2010
Revised: February 2, 2026

Technical Newsletter #36 2.0

Subject: Glue Assist with nailed/stapled down method

The Glue Assist is an installation technique that is used to add better support to the subfloor with using an adhesive when nailing/stapling method is used on wooden subfloors. This installation practice is more and more used now.

MIRAGE produces stable wood flooring products that do not necessarily always require a glue assist unless it is specified. However, we would like to give some guidance if your preference is to opt for this installation method. Our recommendations are based on real testing on hard conditions to make sure the final product integrity and look are not affected.

Platform	Width	Recommendation	Allowed Pattern
TruBalance/ Northern Solid Sawn 3/4" (19 mm)	≤ 6-½" (165 mm)	Free to use	All
	7-3/4" (197 mm)	Recommended	
	9" (226 mm)	Mandatory	
TruBalance Lite/ Northern Solid Sawn Lite 9/16" (14 mm)	5 and 7" (127 and 177 mm)	Free to use	3 or 4
	≥ 8-3/4" (222 mm)	Mandatory	
Solid 3/4" (19 mm)	All	Free to use Preferred for 4-¼" width	All
Engineered 1/2" (13 mm)	< 6-½" (165 mm)	Free to use	3 or 4
	≥ 7" (177 mm)	Recommended	3 or 4 (at least one bead at the tongue edge)

Notes:

1. Use adhesive meeting Technical Newsletter #23 criteria's typically in a sausage/cartridge format.
2. To avoid air pockets between the board and subfloor, make sure to apply sufficient weight on the floorboard and firm force on the handle before pulling the trigger- activated staple gun. (Contact with the subfloor is important. Glue beads should not lead to voids with the subfloor since this can cause noise.)
3. Make sure to use the same requirements for fasteners in Technical Newsletter #30. Glue assist should not be used to extend or modify those criteria.
4. Glue bead should be applied within 1" from the edges of the board, applied on the back of the board or on the subfloor.
5. Glue bead size should be around 3/16 to 1/4".

MIRAGE Technical Service Department 1-800-463-1303
Vintage Technical Service Department 1-877-256-0231
technical@miragefloors.com

5.6 Technical Newsletter #36

Glue Assist Allowed Patterns:

1. **Serpentine (Sine-Wave):**
   Spacing the peaks of the S-curves to around 6 to 8"

2. **Parallel Stripes:**
   Beads need to be perpendicular to plank lengthwise, spaced from 6 to 10" apart.

3. **Ends and Grooves:**
   The bead of adhesive is applied along the groove edge and both ends (optional).

4. **Lengthwise Parallel Stripes:**
   Bead needs to be at 1" from edges.
   3 options available:
   · 1 bead at tongue side.
   · Or 2 on both edges.
   · Or 3 with one in the middle.

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