

NAF SOLID HARDWOOD

PLEASE READ COMPLETELY BEFORE INSTALLATION

Please inspect product for color, finish, quality, and style BEFORE installing any material. NAF's warranty DOES NOT cover materials with visible defects once they have been installed. Any defects should be reported to the flooring dealer IMMEDIATELY for inspection and/or replacement. Failure to follow recommended installation procedures may void warranty.

ALL PLANKS ONCE INSTALLED ARE CONSIDERED AS ACCEPTED BY THE INSTALLER AND/OR HOMEOWNER AND THE MANUFACTURER ASSUMES NO RESPONSIBILITY FOR THE ABOVE.

TOOLS & ACCESSORIES

- Rubber mallet
- Tenon saw, hand saw or circular saw
- Electric drill, with a 3/32-inch (2mm) bit
- Square and measuring tape
- Utility Knife f Tapping Block
- Pencil
- Underlayment (Float install)
- Moisture Meter
- Chalk line
- Level
- Flooring screws (to solidify sub-floor when installing over wooden sub-floor)
- Safety glasses and dust mask
- Broom and dustpan

ADDITIONAL TOOLS NEEDED FOR NAIL-DOWN INSTALLATION

- Hardwood floor nailer (manual or pneumatic)
- Claw hammer and nail punch
- Air compressor/hose as needed

- Hardwood flooring nails (2in / 5cm) - 1 box or 1000 nails per 18.6 sq.m / 200 sq.ft
- Screw shank finishing nails (2.5in / 6.3 cm) or regular finishing nails
- Construction paper or #15 felt floor liner (when installing over wooden sub-floor).

TIP: To prevent damaging this flooring, avoid pounding on it with a rubber mallet during installation. Instead, use a tapping block against the edge of the plank.

BEFORE YOU START

HUMIDITY AND TEMPERATURE

Wood is a natural resource made of fibers that will naturally contract and expand with changes in humidity. This contraction and expansion of wood is normal and will not harm your floor as long as relative humidity (R.H.) levels are maintained between 35% and 55% and temperature between 65-75° F (18-24°C) for at least 3-5 days prior to installation and maintained after installation. This may require the use of an appropriate ventilation and/or humidification system including a humidifier or dehumidifier. Failure to maintain proper humidity levels can exacerbate any problems. Always maintain a 3/4" (19mm) expansion gap around all vertical obstructions including walls to allow for contraction/expansion. Do not handle products in moist or damp areas. Store flooring in a dry, well ventilated, climate-controlled environment. If delivery is to a construction site, flooring should be placed inside a sufficiently enclosed building to ensure it is protected from the weather.

ACCLIMATION

Floors should be acclimated for at least 48-72 hours in the room in which it will be installed. HVAC must be running 72 hours prior to installation. Planks with any visible defects must be put aside for replacement for warranty coverage to apply.

Once floorboards are installed, they are considered accepted and warranty coverage will no longer apply. Failure to allow flooring to acclimatize prior to install may cause/exhibit stress, cracks, cupping, and squeaks.

POST-INSTALLATION COVERINGS

Once installation is complete, cover your floors using heavy-duty protective flooring paper prior to proceeding. NAF does NOT recommend any kind of tape on the actual flooring.

- Tape any covering to base or shoe mouldings using a low-adhesive tape.
- Do not tape to finished flooring! When taping paper or sheets together, tape them to each other.
- Do not allow floor covering to sit on the installed floor for an extended period. Follow manufacturer instructions for any type of cover.

COLOUR CHANGES AND VARIATION

Hardwood flooring ages and matures over time with exposure to UV light. Most floors will darken and become richer in colour. To prevent spot darkening of floors, routinely rearrange area rugs and large pieces of furniture. Many wood floors will display variation in colour from board to board. Some floors will have more variation than others depending on the species. This is not indicative of any fault in the floor but is a natural occurrence with any wood product. Install boards simultaneously from several cartons to ensure good mix of colour and shading.

MOISTURE

Water and wood do not mix. Any spills or liquids should be removed and wiped off your floor promptly and NEVER wet mop wood floors. Damage resulting from standing water or liquid is not covered by warranty.

CARE AND MAINTENANCE

IMPORTANT: Please follow NAF's Care & Maintenance guidelines for special recommendations on care and maintenance.

PREPARING THE AREA

Moldings

- If needed, use a jamb saw to undercut door casings and jambs so that flooring can slide underneath.
- Scribe along the top edge of existing base moldings with a utility knife prior to removing moldings to prevent tearing paint or drywall.

- Remove all existing moldings and doorway thresholds before installing floor.

Environment

- Maintain temperature between 65-75° F (18-24°C) and R.H. at 35-55% for at least 3-5 days before installation, during and maintain after installation. HVAC systems must be operational for at least a week prior.
- Radiant heat systems must be operating at least one week prior to installation. Turn off and let subfloor cool down to room temperature 3-4 hours before installation.
- Ensure basements and crawl spaces are sufficiently ventilated (1.4% of open venting per 1000/square feet ((92.90 m²)) of floor area).
- Insulate overheating and un-insulated heating ducts using a double layer of #15 asphalt felt paper.
- NAF Engineered floors can be installed on, above and below grade where proper care has been taken to ensure flooring conditions meet installation and warranty requirements.

Materials

- Ensure the product you have ordered is the one you have received.
- Acclimatize floors for at least 72 hours.
- Ensure flooring application is appropriate for engineered flooring. Do NOT install floors in moist or damp areas such as, but not limited to, full bathrooms, saunas or outdoors.

SUBFLOORS

ALL SUBFLOORS MUST BE LEVEL within 3/16" over 10' (5mm in 3m) prior to installation. Subfloors that are not level can cause creaking or squeaking which will not be covered by warranty. Carefully inspect your subfloor and replace any nails that are not completely secure. Close adherence to installation instructions can minimize the risk of squeaks, however, there is no guarantee or warranty that your engineered hardwood floor will not squeak. Squeaks are caused when the subfloor separates from the joist. This can happen with temperature and humidity changes or when new construction settles, changing the levelness of the subfloor.

When the wood moves up and down on the pulled nail, it can cause the floor to squeak, therefore, it is recommended that your subfloor is screwed down rather than nailed down to prevent squeaking. Subfloor moisture should not exceed 12% and the difference in moisture between subfloor and flooring should not exceed 3%. If moisture limits are exceeded, DO NOT INSTALL flooring, prior to correcting the problem. Correct by a) raising the heat and increasing ventilation until proper conditions are met or b) apply appropriate moisture retardant or use a vapour barrier underlayment. Subfloor moisture should not exceed 12% and the difference in moisture between subfloor and flooring should not exceed 3%. If moisture limits are exceeded, DO NOT INSTALL flooring, prior to correcting the problem. Correct by a) raising the heat and increasing ventilation until proper conditions are met or b) apply appropriate moisture retardant or use a vapour barrier underlayment.

Plywood

A minimum of $\frac{3}{4}$ " thick plywood is required. Inspect subfloor for creaking, loose edges, chips, sags, etc. and repair if necessary. Subfloor must be level. If installing new plywood subfloor, lay on a diagonal or perpendicular to flooring joists, $\frac{1}{8}$ " (3mm) spacing between panels. Install #15 felt floor liner under subfloor placed over concrete. Securely fasten down plywood panels at least every 6" (152mm). Over old wood floors, apply $\frac{1}{4}$ " to $\frac{3}{8}$ " (6.5-9.5mm) plywood. If a wood subfloor is used above soil, a 6-mil polyethylene moisture barrier with taped seams should be placed over the soil to prevent moisture from getting into the engineered flooring. OSB must be APA rated, at least $\frac{3}{4}$ " (19mm) and maintained in a controlled environment.

Vinyl Sheet or Ceramic Tile

Inspect floor and ensure all tiles are securely fastened to the subfloor. Reattach any loose tiles or sheeting to subfloor, ensuring sufficient adhesion, and allow adhesive to dry completely prior to installation. Roughen the surface with open grit 20-40 sandpaper and clean area. DO NOT glue floors onto cushioned or rubber tiles as floors must stay level. Differences in weight over different areas could cause certain areas of highly cushioned floors to compress, causing dips over time.

Concrete

Concrete subfloors must be cured for at least 45-90 days with 30-60 days drying time prior to installation. Moisture tests must be completed and documented on all concrete slabs using an accurate moisture test. If there is evidence of moisture after performing tests, postpone installation until moisture problem has been corrected or use an appropriate moisture barrier. Moisture readings over 3 lbs/1000 sq. ft. must have a surface moisture barrier applied or warranty will be voided. Please note: You may be required to provide proof of moisture testing documentation for warranty claims. All concrete slabs should have a minimum of 6-mil poly film moisture barrier between the ground and concrete regardless of results. Existing carpeting or under pad **MUST** be removed.

Concrete subfloors must be free of any contaminants such as sealers, paint, oil, wax, etc. which can affect proper adhesion of floors. **DO NOT** use a solvent based stripper to remove any contaminants. Sand any loose concrete with open grit #20 sandpaper and vacuum any debris. Grind down any raised areas and fill in low areas with leveling compound to ensure subfloor is completely level. **DO NOT** install over concrete with compressive strength less than 2500psi.

RADIANT HEAT

NAF Engineered floors are approved for use over hydronic (not electric) radiant heat.

1 . When installing Wood Flooring over radiant heat, floating installation is recommended. Glue down installation over radiant heat is acceptable with the exception of certain species.

2 . Please review our “Special Limited Radiant Heat Warranty” and follow all guidelines for subfloor preparation prior to installation. Plywood with vapour barrier is recommended for all applications (glue, float, nail/staple) over radiant heat.

SPECIAL CARE FOR RADIANT HEAT

- Ensure flooring is approved for use over radiant heat.
- Use adhesives specially formulated for use over radiant heat.
- **NEVER** penetrate heating elements when installing floors over radiant heat.

- Always check subfloors for moisture. Subfloors must have proper moisture tests performed.
- For hydronic radiant heat, a pressure test must be performed and documented by a qualified plumber or radiant heat installer prior to flooring installation.
- An outside thermostat should be installed to prevent changes in moisture content due to temperature.
- DO expect seasonal shrinkage and expansion with changes in temperature and humidity.

IMPORTANT!

With radiant heating, it is EXTREMELY important to maintain humidity at 35-55% and never fall below 35%. Temperature MUST NOT EXCEED 82°F. A humidifier and/or dehumidifier may be needed to maintain humidity at desired levels. Some species may require 45-55% humidity levels. Please consult your local dealer for more details.

Turning Radiant Heat OFF/ON

- Radiant heating system should be run at 2/3 of maximum output for at least 2 weeks before installation to allow any remaining moisture to dissipate.
- Three to five days prior to installation, reduce heating system to 65°F (18°C) so adhesive does not cure excessively or too fast.
- Two days AFTER installation, gradually raise temperature to desired level over the next week.
- SURFACE TEMPERATURE SHOULD NEVER EXCEED 27°C (82°F). • MAINTAIN RELATIVE HUMIDITY AT 35-55%.

Types of Systems Above Radiant Heat

(See NWFA Guidelines for Radiant Heat Installations Appendix H)

1. Concrete with two layers of plywood interlocking covered with moisture barrier.

2. Subfloor directly nailed to floor joist with radiant heat system. The plywood is screwed into place on the floor joist which the radiant heating system is installed. Vapour barrier is between the floor and subfloor.
3. Subfloor over sleepers between radiant heat tubing.

Additional Installation Guidelines

Please follow the guidelines below for each type of installation in addition to the instructions that follow.

Glue Down

- DO NOT glue down any flooring DIRECTLY TO EXPOSED RADIANT HEAT PIPING.
- DO NOT DIRECTLY GLUE DOWN ANY WOOD FLOORING OVER BRITTLE LIGHTWEIGHT CONCRETE.
- Carefully review exempt species² for glue-down installation.
- ONLY USE NAF RECOMMENDED GLUES

Floating

- Only use glues recommended for floating over radiant heat.
- Use recommended HUSSSH2 underlayment. Underlayment must be resistant to temperatures above 30°C or 85°F.

Nail/Staple Down

- AVOID PENETRATION OF THE HEATING ELEMENT. Ensure nails are not too long.

GLUE DOWN INSTALLATION

GENERAL RULES

- Clean any adhesive residue from the flooring surface IMMEDIATELY. DO NOT wait until the end of installation since adhesive may dry and will be very difficult to remove without damaging the finish.
- Use blue painter's tape to hold joints tightly together until adhesive cures. DO NOT USE MASKING TAPE.

- Avoid standing or putting weight on newly installed floors during installation. • During installation, occasionally remove a piece of flooring from the subfloor and inspect the back for proper adhesive transfer. Adequate adhesive transfer is necessary to achieve proper bonding.
- Save a few boards in case board replacement or repair is necessary.

STEP ONE: STARTING THE LAYOUT

1. Installation parallel to the longest and straightest wall is recommended for best visual effects. Install floors perpendicular to flooring joists unless the subfloor has been reinforced to reduce any subfloor sagging.
2. In at least two places, at least 18" (46cm) from the corners of the starting walls, measure out equal distances and snap a chalk line. The measurements must be the sum of the width of the flooring plus an additional 5/8" (16mm) to allow for 3/8" (9.5mm) expansion space and the width of the tongue.
3. Measure the distance between the starting line along the full length of the wall to see if there are any places out of line. It may be necessary to trim board widths in order line the wall with its irregularities.
4. Install a starting strip (NO ADHESIVE, any straight wood material) along the inside edge of the chalk line, closest to the starting wall. This row MUST perfectly align with the starting chalk line.
5. When the row is completely straight, use finish nails or concrete nails to attach strip to the subfloor. This sacrificial row will minimize movement of the floor during the installation process and will be removed later.

STEP TWO: SPREADING THE ADHESIVE

1. Follow all directions according to the adhesive manufacturer. Use a trowel recommended by the adhesive manufacturer to spread adhesive over an area that can be covered with flooring within 30-90 minutes. Work trowel at 45-degree angle in a circular motion.

STEP THREE: INSTALLING THE FLOOR

1. Install the first board along the chalk line, making sure the tongue side is tight against the strip.
2. Insert the next board into the adjoining tongue or groove and force the board tightly against the sacrificial row and first plank. When installing

products wider than 3¼", apply a bead of carpenter's wood glue to all the end grooves prior to installing into the adhesive. When installing pieces, engage the short end-joint first then slide together tightly to engage long joint tongue and groove. To avoid adhesive bleed through and memory pull-back, avoid sliding pieces through the adhesive as much as possible when placing them in position.

3. Once you have installed three or more boards in the first row, you can begin installation of the second row.
4. Select a board for the second row that will allow at least 6" (152mm) of difference between the joints of the first row and second row. Continue installation, starting new rows once three or more boards have been installed for the preceding rows until the laid down adhesive has been covered.
5. Stagger joints a minimum 6" (152mm) in adjacent rows. Avoid alignment of joints in alternating rows which can create an undesirable H-shaped pattern.
6. Once the first section has been completed, inspect all joints closely, tightening all end and side gaps as needed.
7. Measure the final row and trim board lengths to fit along the final wall, maintaining 3/8" (9.5mm) expansion gap. Use blue painter's tap to hold the final row in place.
8. Once main area is complete, remove the sacrificial row, careful not to damage the adjoining boards. Complete installation in the same manner.
9. If required by adhesive manufacturer, roll floor with appropriate weight roller before adhesive cures.
10. If necessary, use weights to flatten boards with bows until adhesive cures in order to prevent hollow spots. Boards that cannot be flattened should be cut in length to reduce the bow or not used.

STEP FOUR: FINISHING

1. Remove all tape from the floor surface. DO NOT let tape remain on flooring longer than 24 hours.

2. Inspect floor for any gaps, chips and adhesive residue while removing tape. Remove all residue, touch up chips and fill with appropriate filler if necessary. Use coloured latex filler for factory finished floors.
3. Install or reinstall all mouldings, nailing to wall, not the floor. Add shoe base if necessary.
4. Vacuum or sweep floor thoroughly.
5. Use only cleaners formulated for pre-finished hardwood floors. NEVER WET MOP OR SPRAY CLEANER DI-RECTLY ON FLOOR.
6. Wait 24 hours before moving furniture (do not drag) and allowing heavy foot traffic.
7. If floor is to be covered for temporary protection, use a breathable material such as, cardboard. NEVER cover with plastic.

FLOATING INSTALLATION

STEP ONE: PREPARING THE FLOOR

1. For concrete subfloors, follow all testing requirements for moisture prior to installation. Install a 6-mil polyfilm vapour barrier with joints overlapping 8" (203mm). Fasten seams every 18-24" (457-610mm) with clear waterproof packing tape. Run outside edges of polyfilm up perimeter of each wall 4" (102mm). Trim excess after flooring installation is complete. DO NOT use vapour barrier over wood subfloors, use moisture retardant.
2. Install recommended HUSSSH underlayment parallel to the starting wall in the same direction flooring will be installed. Butt edges but DO NOT OVERLAP JOINTS. Leave a 3/8" (9.5mm) space between pad and all walls and permanent vertical fixtures. Tape all joints using a waterproof tape with NO wrinkles.

STEP TWO: STARTING THE LAYOUT

1. Installation parallel to the longest and straightest wall is recommended for best visual effects. Install floors perpendicular to flooring joists unless the subfloor has been reinforced to reduce any subfloor sagging.

2. In at least two places, at least 18" (46cm) from the corners of the starting walls, measure out equal distances and snap a chalk line. The measurements must be the sum of the width of the flooring plus an additional 5/8" (16mm) to allow for 3/8" (9.5mm) expansion space and the width of the tongue.
3. Measure the distance between the starting line along the full length of the wall to see if there are any places out of line. It may be necessary to trim board widths in order line the wall with its irregularities.
4. OPTIONAL: Install a row (NO ADHESIVE) along the inside edge of the chalk line, closest to the starting wall. Make sure row is in perfect alignment with the chalk line and use wedges to hold the flooring in place on the ends.

STEP THREE: INSTALLING THE FLOOR

1. Select the longest boards available. Lay the boards out along the length of the room, making certain the final board in the row is at least 12" (305mm) in length. If not, trim the first board to allow the last board to be longer.
2. Begin installation with the tongue facing away from the starting wall. Groove should be facing the starting wall or strip row. The short end groove should be facing the end wall. Align the first board with the starting line.
3. Select the next board. Place a 1/8" (3mm) continuous bead of glue in the inside bottom edge of the short end groove. DO NOT apply glue to the long side groove yet. Carefully interlock the joint of the second board to the first board, keeping the long side aligned with the starting line.
4. Remove any excess glue from the floor surface with a towel dampened (not wet) with warm soapy water. DO NOT LET GLUE DRY ON SURFACE. Use 3M blue painter's tape (NOT MASKING TAPE) to temporarily hold the flooring in place and joints together. Use wedges or spacers along the side and end walls (ends only if sacrificial row was used) to maintain alignment with the starting line. Continue until first row is complete.
5. Measure and cut to length the final board in the first row, allowing 3/8" (9.5mm) expansion gap between the end of the board and end wall. Select a longer board so that the remaining piece of the board can be used to start the next or later rows. Apply glue in the groove and install.
6. If the cut off "waste" piece from the first row, last piece was 18" (457mm) or longer, use it to start the second row. Stagger adjacent row joints at least 6" (152mm).

7. Please a continuous bead of glue along the inside bottom edge of the end groove and side groove. Carefully align the tongue and grooves together and tighten with a tapping block until all joints are snug. Remove any excess glue and temporarily hold joints together with blue tape. Cut and install the final board of the row.

8. Continue until the first few rows are complete. At this point, you want to be certain the floor installation is in perfect alignment to ensure the remainder of the installation goes smoothly. Any variance will worsen as the flooring proceeds further into the room. This is a good time to inspect the floor, before the glue has fully set. Adjust the floor as needed before proceeding.

9. Continue to install the floor as above. Use blue tape to hold joints together and wedges to hold the end joints in place. DO NOT walk on the finished floor during installation since the glue has not fully set. DO NOT roll the floor either.

10. Finish the final row, cutting boards to fit and maintain the 3/8" (9.5mm) expansion gap. 11. If starting strip/sacrificial row was used, remove, and replace with a row of materials, glued same as above.

STEP FOUR: FINISHING

1. Remove all tape from the floor surface

2. Inspect floor for any gaps, chips and adhesive residue while removing tape. Remove all residue, touch up chips and fill with appropriate filler if necessary. Use coloured latex filler for factory finished floors.

3. Install or reinstall all mouldings, nailing to wall, not the floor. Add shoe base if necessary.

4. Vacuum or sweep floor thoroughly and use only cleaners formulated for pre-finished hardwood. NEVER WET MOP OR SPRAY CLEANER DIRECTLY ON FLOOR.

5. Wait 24 hours before moving furniture (do not drag) and allowing heavy foot traffic.

6. If floor is to be covered for temporary protection, use a breathable material. NEVER cover with plastic.

STAPLE/NAIL INSTALLATION

GENERAL RULES

- DO NOT cut short boards to finish a row. After a board is cut, the remainder can be used to start the new rows. A short board that is cut will only produce waste.
- Make sure staple plate is clean and free of nicks.

- When the stapler/nailer are not being used, DO NOT place directly onto the hardwood floor.
- Check the air pressure of your stapler/nailer. Different subfloors and flooring require different air pressures. Staples or cleats can cause blistering, peaking, squeaking, or crackling of the floor if the stapler/nailer is not adjusted properly and staples/cleats are positioned at the wrong angle. Perform a trial on a scrap piece. Set the stapler/nailer flush with the tongue side of the plank and install a staple/cleat. The crown of the staple/cleat should sit flush within the nail pocket. If the crown is set too deep, reduce the air pressure. If the staple/cleat is not set deep enough, increase the air pressure.
- For planks wider than 4", it must be glued both the bottom and the ends of the planks with adhesive in a lazy "S" pattern prior to stapling the flooring down.

STEP ONE: STARTING THE LAYOUT

1. Installation parallel to the longest and straightest wall is recommended for best visual effects. Install floors perpendicular to flooring joists unless the subfloor has been reinforced to reduce any subfloor sagging.
2. Snap a chalk line 5 5/8" (142mm) from the starting wall. This should account for 3/8" (9.5mm) space for expansion gap and the tongue.
3. Install first board, aligning tongue side with starting line, groove side of the board facing the starting wall. IMPORTANT: YOU MUST START STRAIGHT AND SQUARE. Leave a 3/8" (9.5mm) gap at the end and side wall.
4. Pre-drill 1/2" (13mm) from back (groove) edge parallel to the starting wall. Use 6d finish nails and a pneumatic finish nailer to secure the first board every 6-8" (152-203mm) within the tongue side nail pocket at a 45° angle. Nail the edge, not the ends and maintain 3/8" (9.5mm) expansion space. Nail heads will be hidden by quarter rounds and baseboards later.

STEP TWO: INSTALLING THE FLOOR

1. Insert end of the next board into the adjoining tongue or groove and force the butt ends tightly together. Fasten as above until all boards in the first row are complete.
2. Cut the final board for the row, always ensuring there is a 3/8" (9.5mm) expansion space at the wall.
3. Taking boards from several cartons (at least 3), layout or "rack" an area of the floor loosely laying materials side by side, avoiding close joints. Stagger joints a

minimum 6" (152mm) in adjacent rows. Avoid alignment of joints in alternating rows which can create an undesirable H-shaped pattern.

4. Once satisfied with the layout, install the area using cut pieces from the end as starter boards for the next rows to reduce waste. Since wall makes it difficult to use a stapler, use finishing nails every 4" (102mm) along the tongue side for the first few rows, countersinking nails.

5. Once enough rows have been installed, use a stapler or brad nailer for subsequent rows, blind nailing the tongue side. Avoid close alignment of joints in all rows throughout the installation, always striving for the maximum space available and minimum 6" (152mm) between adjacent joints. Nail down boards every 4-5" (102-127mm), but keep more than 2" (51mm) away from the end of each board

6. The last 1-4 rows will need to be face-nailed, like the first few rows when clearance does not permit blind nailing with the stapler.

7. Measure the final row. Trim or rip boards to fit along the length of the wall, allowing for 3/8" (9.5mm) expansion.

STEP THREE: FINISHING

1. Remove all tape from the floor surface.

2. Inspect floor for any gaps, chips, and adhesive residue while removing tape. Remove all residue, touch up chips and fill with appropriate filler if necessary.

Use coloured latex filler for factory finished floors.

3. Install or reinstall all mouldings, nailing to wall, not the floor. Add shoe base if necessary.

4. Vacuum or sweep floor thoroughly and use only \cleaners formulated for pre-finished hardwood. NEVER WET MOP OR SPRAY CLEANER DIRECTLY ON FLOOR.

5. If floor is to be covered for temporary protection, use a breathable material. NEVER cover with plastic.

6. Save a few boards in case board replacement or repair is necessary.

Notes

Hickory, African Teak and Acacia Walnut are NOT covered under warranty for ANY application over radiant heat.