

Radiant Heat Guide

Pre-Finished Engineered Hardwood, Luxury & Premium Vinyl Flooring



Radiant Heat Guide

Hallmark Floors has been manufacturing hardwood floors for over 15 years. Our commitment to quality is unsurpassed. Hallmark Floors collection of hardwood flooring is an exceptional choice for installation over hydronic (warm water) radiant heat systems. Our high-quality engineered flooring systems are very dimensionally stable as opposed to solid hardwood, and is thus ideal in radiant heat applications. Our internal ply glue systems are world class and are TSCA Title VI compliant.

Installation Methods for Hallmark Floors, Hardwood, Luxury or Premium Vinyl with hydronic radiant heat systems include:

1. Wood Floors: can be floated or glued to surface of floor/thermal mass. Nailing is not recommended, see installation instructions for full details.

2. Luxury Vinyl Glue Down: can be achieved with a hard set adhesive, pressure sensitive/ releasable adhesives cannot be used over radiant heat, see installation instructions for full details (not suitable for installation over aluminum channel board.).

3. Luxury & Premium Vinyl with EZ Loc: can be locked together and floated over the surface. see installation instructions for full details (not suitable for installation over aluminum channel board).
NOTE - Glue Down Concrete Thermal Mass – Wood, LVT&P, PVP: Adhesive must be approved by adhesive manufacturer for use with radiant heat. Concrete/ Gypcrete thermal mass must have vapor control capabilities built in. Moisture needs to be controlled below thermal mass not with surface sealers. Thermal mass must be must be rated at a compressive strength of 2500 psi or greater, for. Thermal mass with less than 2500 psi compressive strength must use floating installation method. Follow all adhesive manufacturer's installation and Hallmark Floors installation instructions.

Products Suitable for Installation-Radiant Heat:

HARDWOOD:

Heirloom – All (excluding Hickory)

Hacienda – All (excluding Hickory)

Silverado – All

Chaparral – All (excluding Hickory)

Alta Vista – All

Moderno - All (excluding Hickory)

Monterey - All (excluding Hickory)

Organic Engineered only (excluding Hickory)

Ventura – All (excluding Hickory)

Novella – All (excluding Hickory)

NOTE: Hallmark Hickory and Solid Hardwood Flooring excluded from Radiant Heat Installation Method.

VINYL:

Luxury Vinyl - All

Premium Vinyl - All

PVC Free Vinyl

Frequently Asked Questions

Radiant Heat Systems: In-floor heating systems must be water based, and designed to prevent the surface temperature of the hardwood floor from exceeding 85° F.

Q. At what point should a Hallmark Floors hardwood floor be installed?

A. Hardwood flooring should be the last item installed on the project. All windows and doors must be in place and the structure completely weather tight. If the tubing is encased in lightweight concrete, the concrete must be completely dry. Kitchen cabinets must be in place prior to installation of the floor. The relative humidity conditions must be between 30 and 55%, and the temperature between 60 and 80 degrees F.

Q. How long before installation of the floor should the radiant heat system be powered on?

A. Two to three weeks prior to installation of the hardwood flooring with the thermostat set at 70° F and then at 85° F for 3 more days. The home should be aired out briefly everyday to allow excess humidity from the thermal mass to exhaust moisture out of the structure.

Q. What should the moisture content of the lightweight concrete be before installation?

A. The lightweight concrete moisture content must not exceed 1.5% as measured with a Tramax Moisture Encounter meter.

Q. Do the floors move?

A. A floating floor will have a degree of resilience, or give that a nail-or-glue-down floor does not have.

Q. Do the floors gap or expand and contract?

A. Hardwood flooring is a natural product and will change size with variations in temperature and moisture content. However, engineered hardwood floors are far more dimensionally stable than solid hardwood floors. Good humidity control can minimize these changes even more.

Q. What constitutes a low humidity environment?

A. This varies by geography but is usually defined by areas that experience long periods of freezing weather or have naturally low humidity like the deserts or higher elevations present in the mountains (below 30% humidity).

Q. Should the floor be acclimated?

A. Since the floor is engineered, as such it is pre-acclimated to a 30 to 55% environment. As such long acclimation times are not required. Place the material on site 24 hours prior to installation.

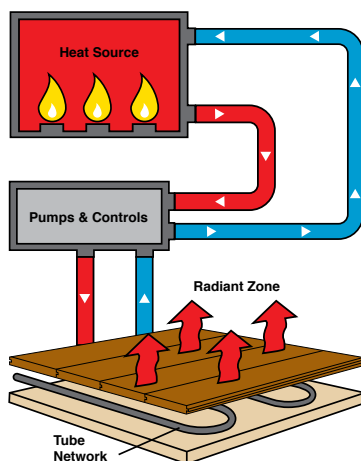
Q. Should radiant heat be turned on before weather becomes cold?

A. Radiant heat should be turned on at low power in the fall and the heat increased gradually. This allows the temperature to be increased slowly with less shock to the floor. An exterior thermostat should be used.

Q. What is Hydronic Radiant Heat?

Conceptual diagram, see following pages for actual systems. Consult a radiant specialist for proper design.

A. Hydronic radiant heat is a system that uses warm water driven through a tube network. Energy is released to warm the room and cool water returned to the boiler to be reheated.



Q. Are there any design limitations you need to be aware of?

A. Radiant heat is very efficient but does have some limitations. When ceilings exceed 10' high, the amount of cubic air that needs to be heated can create problems for a hardwood floor. Rooms with high ceilings can create a situation where the floors can become too warm due to the high volume of space to be heated. Rooms with high ceilings may require radiant heat to be installed in the ceilings and ceiling fans mounted to circulate the air. NOTE: All systems should have a fail-safe to ensure that the surface of the floor never exceeds the recommended surface temperature of 85° F.

Q. Are all hydronic systems OK for use with Hallmark Wood Floors?

A. Only the systems that ensure a very even distribution of heat. Hydronic systems that do not include thermal mass or aluminum transfer sheets will not provide even distribution of heat. Good systems will not have temperature variations exceeding 3° F within a 2' radius.

Q. Are electric radiant heat systems OK for Hallmark Wood Floors?

A. Electric radiant heat systems are not accepted by Hallmark Floors for use under hardwood flooring. Electric systems are high temperature systems with the heat highly concentrated on the electrical filament. This creates spots of heat in the floor that are too hot for proper wood flooring performance.

Q. Can area rugs increase thermal resistance and overheat the floor?

A. Depending on the thickness of the area rug, a situation can develop where the floor could be overheated. However, a well designed radiant system is usually operating well below the maximum of 85° F. After rugs are in place, ask your radiant heat contractor to turn back the rugs and measure the surface temperature of the floor with an infrared surface thermometer to determine if the rug is making the floor too hot. Make adjustments to turn down the heat down as necessary.

Q. Can book cases and entertainment units increase thermal resistance and overheat the floor?

A. Just like area rugs, anything that sits on top of the floor can trap heat. This should not be any more cause for alarm than an area rug.

Q. Can radiant heat damage a wood floor?

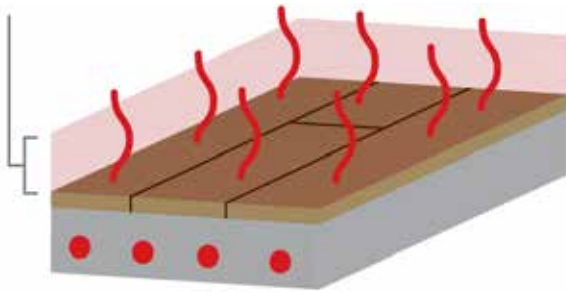
A. Poorly designed or passive radiant systems can damage a wood floor. Air movement and proper humidity are crucial to proper performance of the floor. Surface temperature should never exceed 80°F.

Q. What is passive radiant heat?

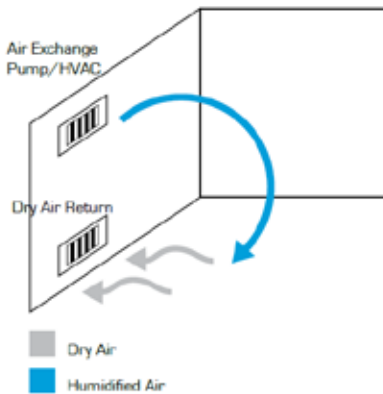
A. Passive radiant heat is one where the structure does not have the ability to move air and control humidity. As heat rises from the wood floor it carries humidity up away from the floor with the rising warm air.

Q. Why is humidity control and air movement so important with radiant heat?

A. Wood is hygroscopic and if it gets too hot or the moisture content of the wood gets too low, problems occur. Without air movement, the heat rises from radiant heated floors and creates an excessively low humidity zone directly over the floor.



Low Relative Humidity Zone

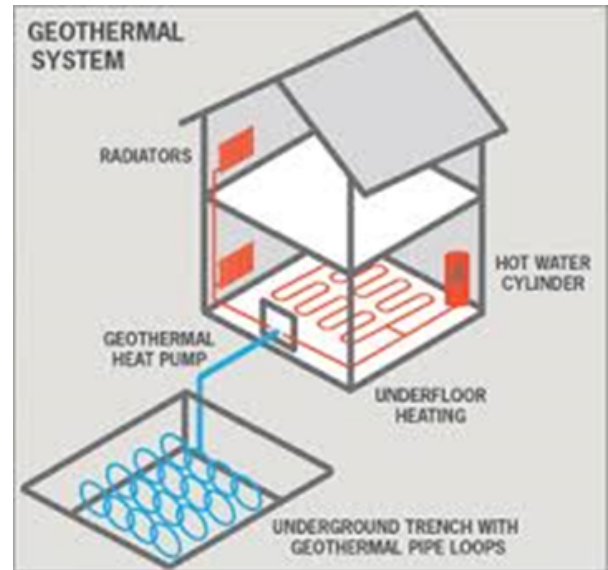


Q. Are geothermal heat pumps acceptable for radiant heat?

A. Yes, Geothermal heat pumps (GHPs), sometimes referred to as GeoExchange, earth-coupled, ground-source, or water-source heat pumps, have been in use since the late 1940s. They use the constant temperature of the earth as the exchange medium instead of the outside air temperature. The heat

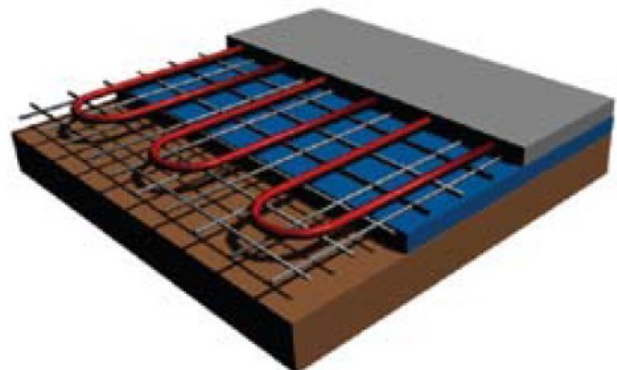
extracted from the ground is transferred to the boiler making it more energy efficient.

Although many parts of the country experience seasonal temperature extremes -- from scorching heat in the summer to sub-zero cold in the winter—a few feet below the earth's surface the ground remains at a relatively constant temperature. Depending on latitude, ground temperatures range from 45°F (7°C) to 75°F (21°C). Like a cave, this ground temperature is warmer than the air above it during the winter and cooler than the air in the summer. The GHP takes advantage of this by exchanging heat with the earth through a ground heat exchanger.

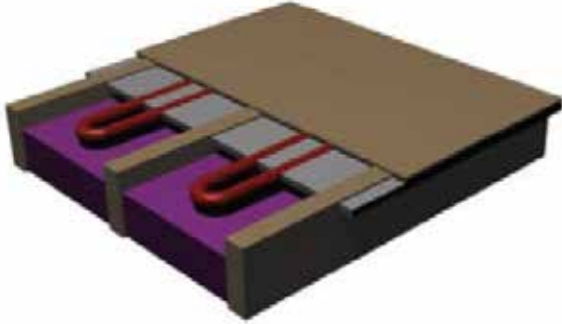


What types of hydronic systems are suitable for a Hallmark Floors wood floor floating installation?

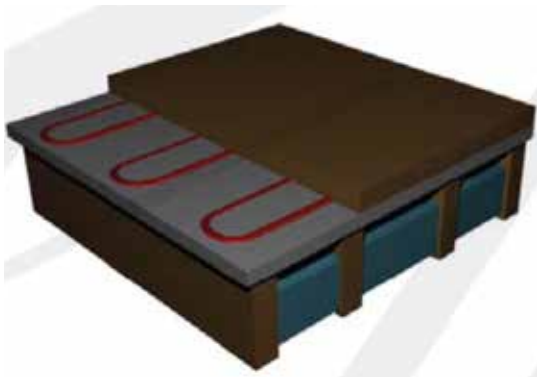
1. Lightweight Concrete or Gypcrete Thermal Mass: The heating tubes are installed and lightweight concrete or gypcrete poured over the tubing. Concrete/ gypcrete acts as a radiator to provide even distribution of heat. (This is the method described in previous section.) Although this is the most traditional method, additional systems have been developed. Installation method: Glue Down or Floating.



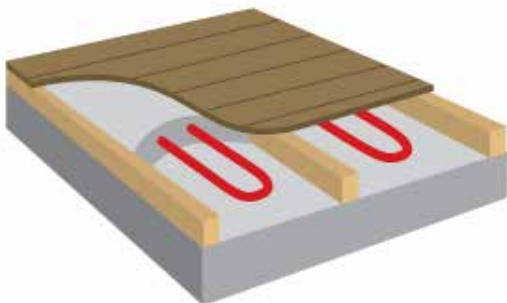
2. Aluminum Hangers: The tubing is suspended in aluminum hangers with channels to accommodate the tubing. An efficient conductor of heat, these aluminum hangers radiate heat evenly and effectively upwards. This system removes the need for a concrete thermal mass and eliminates the corresponding weight and elevation gain it produces. Installation method: Glue Down or Floating.



3. Channeled Aluminum Board: Wood subfloor panels are channeled and an aluminum transfer sheet is vacuum pressed to the surface at the channel board factory. The water tubes are then pressed into the channels, on the jobsite and hooked up to the boiler. The tubing in the channels transfers heat to the aluminum and generates very even results. Since there is less loss of thermal energy, this system is more efficient than others. Installation method: Floating Only.



4. Sleeper System with Deck: Sleeper system is applied to subfloor. Heat tubing is then run between the sleeper system. A plywood deck/substrate with an aluminum sheet applied to the bottom side (towards tubing) is attached to the sleepers. Installation method: Floating Only.



Technical Information

Thermal Resistance/Insulation R-Value of Flooring Materials

9/16" & 1/2" products = 0.45 - 0.50

5/8" products = 0.50 - 0.55

Terminology

Subfloor Tolerance: Degree of flatness; 3/16" in 10' radius or 1/8" in 6' radius (see installation instructions).

Flow Temperature (F): Water temperature flowing from the boiler to the tubing under the floor. Most hydronic systems operate at about 95° - 113° F. The temperature depends on the type of system and how efficient it is in radiating heat.

Mechanical Humidity Control: The heating/ventilation/ air conditioning system should have mechanical humidity control. Control of relative humidity in room will ensure the woods moisture equilibrium will remain a proper levels.

Exterior Thermostat: An exterior thermostat is recommended to protect the system from condensation absorption during spring and fall when rapid changes in temperature and relative humidity may occur.

Heat Transfer Point Control: Acts as a fail-safe to prevent wood flooring surface from exceeding 80° F. A well designed system should have a set point control that will monitor the temperature of the wood floor. The set point control should either reduce the system water temperature or temporarily cycle the system off to prevent overheating the floor in case of equipment malfunction.

Advances in Radiant Heat Systems

Radiant heat is enjoying a surge in popularity. Some builders remain reluctant to work with these systems because of misgivings that exist in the builder community. Forty years ago, radiant heat systems operated at much higher temperatures to compensate for the lack of insulation. However, modern systems now make it possible to install these systems without damaging the hardwood floors or making the floor covering too warm to walk on in bare feet.

Refer to www.hallmarkfloors.com for the latest, updated information.

www.hallmarkfloors.com
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