

## RADIANT HEAT SYSTEMS

### WHAT IS UNDERFLOOR/ RADIANT HEATING?

Underfloor, or radiant heating uses the floor surface to emit heat through the home. Radiant systems allow you to use the entire floor as a heating area at relatively low surface temperatures when compared to radiators which heat with higher surface temperatures.

There are 2 main types of radiant heat systems. The first is hot water pipes that are embedded into the construction of the floor, and the second is Electric cables that are also embedded into the floor. For many reasons, such as heat damage to the flooring and the potential for high CO<sub>2</sub> emissions, wood floors should only be installed over embedded hot water systems. **DO NOT** install wood flooring over electric heating systems. Given the potential for product damage, we will limit our comments to the approved, hot water, method.

### ENERGY EFFICIENCY

Radiant systems are compatible with low temperature heat sources such as condensing boilers and heat pumps, both of which run at lower temperatures and require less energy than radiators. With radiant heat flooring systems, heat is transmitted directly to objects and people from the floor, and not by first warming the air in the room. This means that a larger proportion of heat emitted through underfloor systems is utilized to provide warmth directly to people, furniture and other things. Since less energy is used to warm the air first, thermostat settings can be set lower and achieve the same level of comfort as radiators.

### KEY CONSIDERATIONS AND GUIDELINES

Always seek advice from professional underfloor heating system manufacturers, designers and installers as early in the design process as possible. Professionals will be able to advise on the floor construction, layout and spacing of the heating loops to meet heating demand in the home, heat loss calculations, installation and standards of workmanship, and finally appropriate floor coverings.

Ensure all building regulations, terms and conditions of the underfloor system manufacturer are met in full. **DO NOT** take short cuts to save money as the longer term costs could be enormous.

**NEVER** use the underfloor heating system to dry the screed. You will destroy the integrity of the cement screed.

Ribadao requires the use of a data collection device, such as a Fidbox or other data collection system, installed during installation to monitor and measure the heat and moisture content in the floor. A minimum of 1 data collection device will be required for every level of the home where the flooring is installed, and one per every 1500 square feet of installation. Natural wood is prone to cracking due to thermal expansion and contraction when used over underfloor heating systems. Special care and consideration should be given when specifying board width and thickness.

### INSTALLING UNDERFLOOR HEATING

Underfloor heating should be installed after all external doors and windows have been installed and the home is watertight. This is to ensure the installation is protected from damage due to frost in the pipework loops during cold weather. Installation must be pressure tested prior to the floor being installed. Problems are remedied easier before the floor is complete.

It is highly recommended that qualified installers, recommended by the manufacturer of the underfloor system execute the installation.

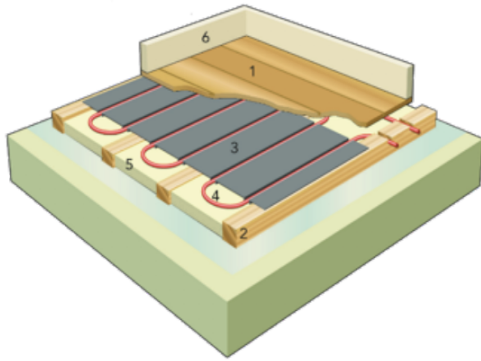
The heating system should be operated at 60% of maximum output for at least 2 weeks for complete moisture stabilization. Approximately 3 days prior to installation, reduce the heating system to a suitable temperature of about 18 degrees celsius or 64 degrees Fahrenheit.

Floors must be insulated to minimize downward heat losses. The thickness of insulation should take into account the floor material and the resistance to heat it will offer. Where radiant heating pipes are installed within a screed, the thickness of the screed layer will also effect the proportion of heat transferred upwards or downwards. Insulation levels required to comply with Building Regulations are likely to be sufficient to limit downward heat loss from underfloor heating loops. Consult a professional. A rule of thumb is the resistance value of insulation should be at least 10 times the resistance value of the floor. The insulation type and thickness should be confirmed by calculations, taking into account the species, shape and size of the floor.

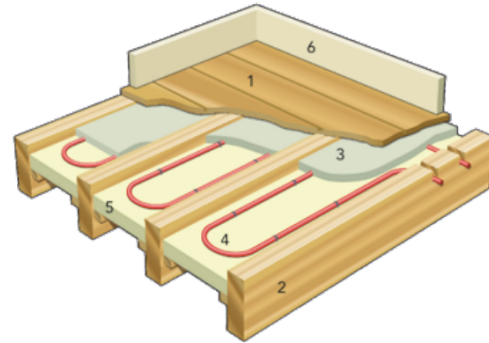
There must be sufficient insulation below the underfloor heating and also a good damp proof membrane to prevent heat loss and moisture being drawn up through the screed. The spacing of the pipework should be balanced to achieve even temperature distribution across the entire floor. Edge insulation is required to prevent heat loss from the floor to the walls.



There must be floor control valves to ensure the temperature never exceeds 80 degrees Fahrenheit / 27 degrees celsius where the wood floor meets the screed or underlay. This cannot be achieved by thermostats. The best system is to have sensors fitted into the screed that will turn the system off if the surface temperature exceeds 80 degrees Fahrenheit/27 degrees Celsius. There are 2 ways to lay out heating loops under wooden floors: **1)** inserted pre-formed metal diffuser plates, which are in direct contact with the floor finish, ensuring even heat transfer to the floor finish surface, and **2)** embedded in a layer of lightweight screed over the insulation between joists. This is not common and special care must be taken to ensure there are no gaps between the insulation and joists for the screed to flow into.



Option 1



Option 2

Prior to installation of the heating loops, insulation between floor joists should be installed as close to the underside of the plates or the heating loops as possible. The plates should not sag and should have good contact with the floor finish. Insulation should never be installed over the heating loops, and the top surface of the diffuser plate should be clean before the floor is installed.

### ENGINEERED OR SOLID HARDWOOD ?

Both solid and Engineered Hardwood flooring can be used over radiant heat systems. However, engineered flooring, with its cross play construction, is more stable and thus more suitable for use with radiant heat systems than solid hardwood flooring. This “resistance” to expansion and contraction from heat and moisture is very important as the floor is in close contact with the source of heat. Solid wood flooring, on the other hand, is quite likely to develop unsightly gaps and may even cup or bow depending on the quality, cut and installation of the floor.

Certain species are known for their inherent stability, such as European and North American oak, American Cherry, and others. Denser domestic species, such as Hickory and Maple, as well as Exotic species such as Brazilian Cherry, Brazilian Teak, Brazilian walnut and others, are less stable and more susceptible to the problems listed above. Because of this, Ribadao does not warranty the use of Exotic floors with radiant heat systems.

### ACCLIMATION OF WOOD FLOORING

Wood flooring is hygroscopic and will exhibit dimensional change as a result of variations in moisture, temperature and humidity within the surrounding environment. This giving and taking in of moisture continues until the flooring reaches an equilibrium with its environmental conditions. The process of finding and reaching this equilibrium is called acclimation.

The flooring needs to be brought into the installation location after the 21 day initial running period and held in the location where it will be installed. All wet trades must be finished and screeds dry with moisture level below 8% and humidity in the location below 65%.

The radiant heating system must be completed, turned on and tested. **DO NOT** run the system as a means of drying out the floor. Handle and unload hardwood flooring with care and store within the environmentally controlled site in which it is expected to perform. **DO NOT** store wood flooring at the job site under uncontrolled environmental conditions such as garages, exterior patios, or anywhere that does not mimic the installation location. Store flooring elevated at least 4” to allow air to circulate under cartons.

Ideal interior environmental conditions vary from region to region and job-site to job-site. It is the local flooring professional's responsibility to know what the “ideal” conditions are and customize around those conditions. Always use a moisture meter to determine where the flooring and present job-site conditions are in relation to the projected final equilibrium point. Upon delivery, check moisture content from several boxes to establish a baseline for acclimation.

Acclimate flooring for as long as necessary to meet minimum installation requirements for moisture content. Not properly acclimating wood flooring may cause excessive expansion, shrinkage, dimensional distortion or structural damage. Flooring is considered acclimated when the moisture difference between the flooring and the sub-floor materials is not greater than 4%, even less with wider planks.



## OPERATION ON THE RADIANT HEATING SYSTEM AFTER THE WOOD IS INSTALLED

It is very important not to shock the floor by introducing the heat too quickly. Wood flooring will have some moisture in its cell structure and natural oils help to maintain this. However, if the floor is overheated and allowed to dry too much, the fibrous nature of the cell structure will start to split, causing problems for your floor.

To minimize the effect of rapid temperature changes, Ribadao recommends installation of an outside thermostat. Radiant systems work most effectively and with less trauma to the wood floor if the heating process is gradual, based on small incremental increases in relation to the outside temperature.

If site finishing the wood floor, do not turn on the heating system for at least 48 hours. If the floor has been oiled, it is important to follow the manufacturer's curing time before turning the system back on. It is important not to dry the oils out by turning the system back on.

## CARE AND MAINTENANCE

It is important to sweep, dust and or vacuum your floors regularly. Dirt and debris left on the floor, such as sand, grit, dirt or grease, can abate and damage the finish of your floor, voiding your warranty. Make sure wheels of vacuum are clean and use a brush or felt type of vacuum head. Do not use a vacuum with a beater bar head as it can dull or scratch the finish.

Never wet mop, damp mop or wash your factory finished floor with water, soap, oil soap, detergents or other liquid cleaning material. Use a soft cloth to blot spills and spots as soon as they happen. Always avoid allowing liquids to stand on your hardwood floor.

For more thorough cleaning of entire floor, mist a cleaner, made for polyurethane coated hardwood floors, and wipe with a clean micro-fiber mop head. Hardwood floor cleaner is available at most local flooring retail or hardware stores. Do not use oil based, wax, polish or strong ammoniated products. They can dull the finish and leave residue, which are not covered under your warranty.

Do not steam clean. Too much water and high heat cause buckling and finish delamination and will void your warranty.

## PROTECT YOUR HARDWOOD FLOOR

Use walk off/entry mats at doorways and area rugs in high traffic areas to make long term care easier. To prevent slipping, use an approved vinyl rug underlayment. do not use rubber, or foam backed plastic mats.

Install felt floor protectors under furniture and appliances to help prevent scratches and dents. Use soft rubber casters for rolling furniture. As a general rule, the heavier the object, the wider the floor protector should be. Avoid dragging heavy objects on the floor. Use care with sharp objects. Remove shoes with spiked or damaged heels before walking on your hardwood floor. They can scratch or indent the floor. Trim pet's nails regularly. Avoid prolonged exposure to sunlight which can change tones and accelerate the oxidation process.

Rearrange your rugs and furniture periodically to allow the flooring to age evenly. Maintain a normal indoor relative humidity level between 35%-55% throughout the year to minimize the natural expansion and contraction of the wood. During the heating season, when it is dry, a humidifier is recommended to prevent excessive shrinkage due to low humidity levels. Wood Stoves and electric heat tend to create very dry conditions.

Non-heating seasons tend to be moist. An air conditioner, dehumidifier can maintain humidity during the summer months.

Do not use hardwood floor cleaning machines or steam cleaners.

Do not use any steel wool, scouring powders or other abrasive cleaners.

**Thank you for your purchase of Ribadao Flooring. We strive to manufacture the highest quality flooring products with the greatest value for our customers.**

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