



BOUT YOUR HOUSE

CE4

RADIANT HYDRONIC FLOOR HEATING

What is radiant floor heating?

Radiant hydronic floor heating is a system of pipes or tubes laid beneath a tile or hardwood floor. The pipes, encased in concrete or gypsum cement, carry heated water that radiates warmth up through the floor surface. This "floor-to-feet" heating provides warmth directly and evenly.

Radiant floor heating is not new—it was used by the Romans to warm their bathhouses and has been popular in Korea for centuries. It was brought to North America from Europe after the Second World War.

Its popularity has increased in recent years with the growing market for ceramic tile floors, the constant search for energy-efficient and comfortable home climate systems, and the development of healthy homes, especially for people with environmental sensitivities.

Heating is just one part of a home's climate control system. Other components include a ventilation system to move and filter air and, sometimes, air conditioning. In forced-air heating systems, the house heating and ventilation systems are combined. With radiant heating, a separate ventilation system is required.

Advantages of radiant hydronic floor heating

Comfort

Radiant floor heating provides even, comfortable warmth. It is particularly effective for tile floors, which conduct heat easily.

Energy-Efficiency

Radiant floor heating heats evenly, making a room as warm near the floor as at the ceiling. It warms objects directly in contact with the floor, including people, and notably their feet. Radiant floor heating may provide the same level of comfort as conventional heating systems at a lower room air temperature.



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With radiant floor heating, it is easy to set separate controls for individual rooms, so seldom-used rooms can be kept at lower temperatures.

Quiet

A hydronic heating system is quiet because the pump used to move the water through the pipes can be installed away from the living area to where it cannot be heard. As well, since fans are required only for the ventilation system, they can be smaller and quieter than forced-air heating system fans.

Cleanliness

Unlike other heating systems, radiant floor heating has no ducts or radiators to collect dust.

Compatibility

Since radiant floor heating has a low operating temperature, a wide range of sources can be used to heat the water—a ground-source heat pump, a condensing boiler or even district heating.

Disadvantages

One drawback to radiant floor heating is slow response time. It takes a while to build up enough heat to increase room temperature. There is also the cost of an additional ventilation system.

Radiant hydronic floor and the healthy house

Radiant hydronic floor heating provides an alternative heating system for people with allergies or other environmental sensitivities. Radiant floor heating has no moving air. When it is coupled with a well-designed ventilation system, it can contribute significantly to a clean, healthy indoor environment.

Non-combustion sources of heat for the system, such as electricity, allow better indoor air quality levels in the house. Combustion heat sources can be used if care is taken to prevent combustion leakage in the occupied space of the home.

Hypersensitive people often feel the cold more. The radiant floor heating can provide more even heat than some alternative heating systems.

Installing and using radiant hydronic heating

Radiant hydronic floor heating is easily installed during the construction of a new house. It can also be added to older houses, but with some disruption.

Ground level floors can be retrofitted easily if the basement is unfinished and the subfloor is exposed. Otherwise, ceilings are usually removed so that the heating pipes can be installed beneath the floor above.

It is possible to add radiant heating to one room or several—many people choose to heat a bathroom, kitchen or family room only. Depending on the demand, it may be necessary to add a second hot water tank to ensure a sufficient supply of water for the heating system and for daily use.

Because it is difficult to fix leaks in tubing that is encased in concrete, it is important to pressure test the system before pouring the concrete or gypsum cement floor.

Radiant hydronic floor heating works most efficiently with tile or hardwood floor coverings. Carpeting acts as an unwanted insulation layer between the heating pipes and the living area and is not recommended for use on radiant floor heating.

While hardwood floors can be used on radiant floor heating, special attention must be paid to installation to avoid warping and lifting. Methods for installing hardwood on a radiant-heated floor have been developed for various climates and conditions. Consult the instructions provided by product manufacturers for detailed information.

A radiant heating system requires the installation of separate, ducted ventilation. As any heating system can dry the air in a house, some way of providing humidity may be needed.

If radiant hydronic floor heating is installed in a house without a basement, insulated slab or insulated crawl space, an antifreeze mixture should be pumped through the heating pipes instead of water.

How economical is it?

At present, a radiant hydronic heating system is more expensive to install than conventional heating systems. However, it can be more energy-efficient to operate depending upon occupant use.

Where can I find more information?

Heating contractors can provide information on the particular systems they install. Heating equipment wholesalers can also provide information on radiant heating products. Check the Yellow Pages™ of your phone book.

**To find out about other CMHC publications,
contact:**

Your local CMHC office

or

Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa ON K1A 0P7

Phone: 1 800 668-2642

Fax: 1 800 245-9274

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