

In-Floor Hot Water Radiant Heating

An Old Idea That's New Again

Hot water radiant heating is a technology that goes back thousands of years. Commonly used in commercial and industrial buildings, this type of heating has regained ground in residential applications as people discover its many benefits.

Old Technologies, Old Problems

The first residential applications, which came to North America in the 1950s, had a few problems: the pipes reacted with the concrete, leading to corrosion and eventual leaking. Once a leak started, it was difficult to fix. In most cases, these systems were abandoned and replaced with forced-air heating systems.

The trend toward carpeted floors delivered the final blow to in-floor hot water heat since carpeting substantially reduces the radiation effect.

New Technology, Problems Solved

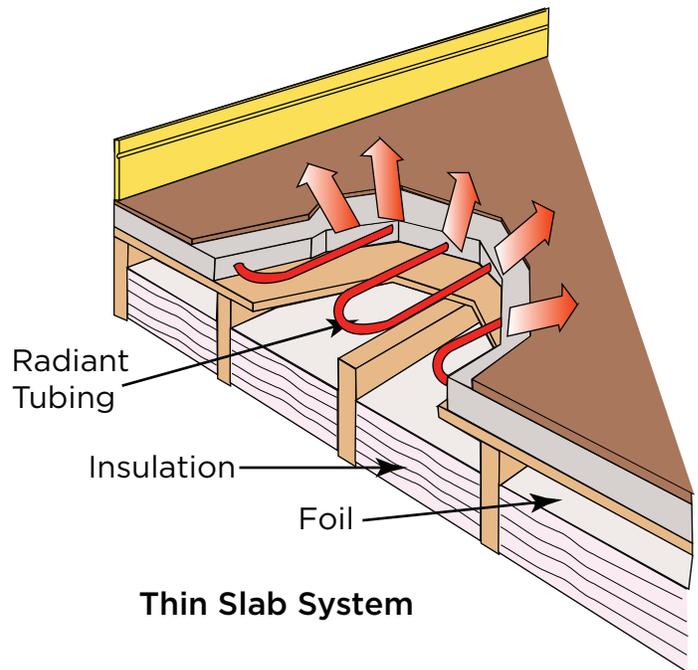
Today, new piping systems, such as cross-linked polyethylene (PEX), deliver pipe stability over the long term. PEX has a proven track record.

With new technologies, hard surfaces such as tile, hardwood and finished concrete, previously avoided because of their cold surfaces, have become popular again. They are ideal for in-floor radiant heating. Popularity and demand has also increased the availability of efficient hot water heating systems.

What's Radiant Heating?

Unlike convective heating (a traditional system that heats air, moving the hot air throughout the home), radiant heat warms up the room without heating the air first. In fact, it heats the objects and the people in the room directly.

Some people wonder if radiant heating is safe. It better be because it is how the earth gets heated by the sun. All objects and people radiate heat all the time. Modern in-floor radiant heat works in a similar fashion.



How Does it Work?

Warm water circulates through pipes in the floor, creating a large, efficient heat generator that radiates heat energy into the room. The three most common pipe arrangements are:

- **Embedded** - this type is the most common for finished concrete or slab-on-grade floors.
- **Dry system** - the tubing is attached under the sub-floor, commonly applied to hardwood or laminate floors above grade.
- **Thin slab system** - the tubing is embedded in a thin layer of concrete prior to applying the finish floor, such as tile.

Benefits of Radiant Heating

- **The heat is where you want it** - convective heating tends to cause heat stratification, with hot air collecting near the ceiling. Radiant heating has less of a tendency to stratify, generating more uniform heat.
- **No drafts** - in-floor radiant heating does not create drafts, a benefit to allergy sufferers since no dust blows around the house. Also, a typically cold hardwood or tile floor becomes neutral or slightly warm to the touch.
- **Quiet** - a properly installed system is virtually silent.
- **Energy efficient** - theoretically, an in-floor radiant heating system is more efficient because you can achieve the same comfort level with the thermostat set a few degrees lower than for conventional heat. Efficiency also improves because the heat is closer to the floor, resulting in less heat loss through ceilings and walls.
- **No exposed radiators or convectors** - all the piping is in the floor, leaving more room for your furniture!

Adding In-Floor Hot Water Radiant Heat

While still fairly uncommon, some homes have in-floor hot water radiant heating installed at the time of construction. For the rest of us, we may consider adding radiant heat to areas of the home as part of a renovation. It would likely be expensive to retrofit an entire home. The most common areas to add radiant heating are kitchens, bathrooms and living rooms.

If you are considering in-floor hot water heat for an addition or renovation, find someone who specializes in this system at the planning stage to ensure the design will accommodate this system most effectively.

