



## Radiant heat in the walls and ceiling

Radiant heat floors, or “hydronic radiant floors,” have been popular in new construction since 2000 or so and are a very energy efficient way to heat a home. A low temperature, radiantly heated room has a more even floor-to-ceiling temperature profile than other heating systems. This translates into lower air temperatures at the ceiling, which reduces the rate of heat loss through the ceiling. Also, using a lower boiler water supply temperature for space heating enables your boiler run more efficiently.

Radiant systems are made of tubing installed in a looping pattern. In the floor they are usually set in concrete or gypsum. Residents love the warmth on their feet, especially in bedrooms and bathrooms.

Radiant heat walls and ceilings work the same way, although the installation is “dry,” meaning the tubes are set into notches cut into insulation or plywood, or held in place with specially designed plates screwed onto existing walls or ceilings.

These systems work well thanks to a law of physics that tells us “heat goes to cold.” Unlike hot air that rises, the radiant heat travels as waves in all directions. It heats the objects it strikes.

There are a few advantages to installing the system in a wall or ceiling. Because you are not heating a whole mass of concrete or gypsum (the standard floor installation), the wall or ceiling system can increase the room temperature more quickly. Whereas it may take two or three hours for a room to change five degrees using the higher-mass floor system, the response time in a wall or ceiling system can be half that or less.

Because you want your feet to be comfortable walking on the radiant floor, the temperature of the floor surface shouldn’t be higher than 85°F. Walls and ceilings can run at higher temperatures without causing occupant discomfort. (Note that this will cause an accompanying increase in boiler temperature and expense.) If you are able to increase wall or ceiling thickness, you can fairly easily retrofit your home with hydronic radiant walls or ceilings. With added insulation, you can add this system to the inside of an exterior wall, too. It is best when adding hydronic radiant surfaces to set up the system so that you can control each room individually.

Because these systems do not react as quickly as other heating systems, you may want to be able to keep your bedroom, living room, kitchen, and bathroom set at different temperatures.