



## What are the advantages of hot water in-floor heat versus baseboard heating?

Radiant hot water (hydronic) floor heating systems usually cost more than baseboards, however they do offer very significant performance advantages. The typical hydronic floor heating system consists of tubing installed in a looping pattern in the floor. This arrangement is specifically sized and spaced to release a given amount of heat from the hot water flowing through the tubes.

There are two primary types of installations: “wet” and “dry.” A wet system is also known as “slab heating” and involves embedding the tubing in a poured concrete or gypsum floor. “Dry” systems route the tubing either under or on top of an existing wood subfloor. Depending on the insulative properties of the floor covering (such as carpet), dry systems may need to operate at higher temperatures to perform comparably to wet systems. With both types of systems, insulation is often added under the tubing to insure that most of the floor heat travels in the desired direction, rather than into the soils around the foundation.

One of the biggest arguments in favor of in-floor heat is the comfort level. With such a large surface area emitting radiant heat very evenly, most occupants with warm floors tend to feel more comfortable even if the air temperatures are slightly cooler, which in turn may lead to lower thermostat settings.

From the energy savings perspective, hydronic floor heating runs significantly cooler than hot water baseboards. For instance, the water temperatures in the tubing running through a concrete slab usually range between 80 and 130 degrees F while baseboards operate between 130 and 165 degrees F. Usually, the lower water temperatures needed for slab heating allow the boiler to run cooler. A cooler running boiler has several advantages, such as less heat loss up the chimney when the boiler is in an off cycle. Similarly, the boiler has less “jacket loss” where heat is lost from the boiler to the room. Cooler water heating can also make the best use of a condensing boiler, which can operate at lower temperatures and generate efficiencies of up to 94%. Conventional boiler efficiencies top out at around 87%. When it comes to conventional boilers, cooler operating temperatures produce less system stress, which can extend the service life of certain boilers.

Although the initial costs are higher, the long-term benefits of hydronic floor heating are worthy of consideration, and can also contribute to the value of the home.