

Hot Water on Demand

Imagine a touch-screen pad next to your tub. Enter a desired temperature and the tub fills with water at exactly that temperature. Imagine never running out of hot water again. Welcome to on-demand water heaters. There is more to on-demand water heaters than endless hot water. They save energy, too. The concept is not new. In fact, these systems have been around for over 40 years and are common where the cost of energy is high such as Europe and Japan.



How It Works

A standard water heater heats a large reservoir of water over a long period of time. When you need hot water, it's there waiting for you. Once you use it up, you have to wait if you want more. A hot water on demand system heats water as you need it using gas or electricity. When you turn on a hot water tap:

1. Cold water flows into the system triggering the flow sensor.
2. Powerful burners ignite and heat the water as it flows through the heat exchanger.
3. The water comes out at the required temperature.

There is no tank or reservoir of water to heat up. For this reason, a hot water on demand system is commonly called a "tankless water heater."

Tank Versus Tankless

When your water heater gets old should you replace it with another standard system or should you install a hot water on demand system? There are three key benefits of a hot water on demand system:

- All the hot water you want.
- More energy efficient because there are no standby heat losses. Standard systems use energy to maintain the temperature of the water stored in the tank.
- A hot water on demand system is a small box mounted on the wall. You'll recover some extra floor space by removing your old hot water tank.

The main downsides are:

The up-front costs are much higher, including purchase price and installation costs.

- It takes an experienced technician to select and install a system properly. There are lots of ways to go wrong with a hot water on demand system.

- If your power goes out, you don't get any hot water. With a tank system, at least you have a tank full of hot water.

Saving Energy

A hot water on demand system is energy efficient because there is no reservoir of water to keep hot. The **operating efficiency** is not a good measure when comparing a standard system and a tankless system because it does not account for the standby losses. A better point of comparison is the **energy factor**. The energy factor is an estimate of the total energy cost for hot water. For example, the energy factor for a typical tank style hot water heater is about 0.55. This means that on average, for every dollar you spend on gas you get about 55 cents worth of hot water. A modern gas-fired tankless system has an energy factor of about 0.84.

Saving Money

You can save energy with a hot water on demand system but can you save money? Is the higher up-front cost justified by the energy savings? Most product literature is misleading. A 20% energy saving is a realistic comparison of a modern tank system and a modern tankless system. Depending on your energy cost and the amount of hot water you use in a year, the payback may be 4 to 9 years. This is not bad when you consider that these systems last about 20 years compared to about 10 years for a standard tank hot water heater. If you are planning to live in your house for a while, you will eventually benefit from a lower life-cycle cost and from lower energy costs.

Skilled Technician

Thinking of installing a hot water on demand system? A skilled and experienced technician is a must! A hot water on demand system requires a powerful burner to heat the water as it flows past the flame. The burner has to be powerful enough to heat the water even if several hot water taps are running at the same time. A skilled technician will know how to size the unit to supply the needs of the home. Many less skilled installers get this wrong. You have to consider how cold the water is to start with. For example, consider two identical houses, one located in Florida and the other located in Ohio. The home in Ohio will need a much more powerful burner because the water entering the system may be only 45 degrees in the winter!

A skilled installer will be able to anticipate problems such as an inadequate gas line. The burner in a tankless water heater is so powerful it needs a large gas flow rate to feed it. If the existing gas line is not large enough, a new line will have to be installed.

