

# On-demand water heaters

(also known as tankless or instantaneous water heaters)

## How are they different?

- They don't store water in a tank. Instead, they heat water as it flows through.

This fact sheet discusses gas-fired on-demand water heaters that are large enough to serve a whole house. Sometimes these whole-house heaters are confused with small point-of-use heaters or with "on-demand" pumps that reduce the waiting time for hot water.



On-demand water heater display model

## Potential advantages of on-demand heaters

- Save energy.
- Never run out of hot water (within flow limits).
- Should last longer.
- Free up floor space.
- Failed components can be replaced. When a tank leaks on a regular water heater, the whole water heater must be replaced.

## Potential disadvantages of on-demand water heaters

- Cost more to buy and install.
- Hot water often takes longer to arrive.
- Can't provide a slow trickle or a splash of hot water.
- May require bigger gas and water pipes or a larger gas meter.
- Many plumbers do not install or service them.

## How much can I save?

- Short answer; about \$40 to \$70 per year.

In theory, an on-demand water heater with an Energy Factor (EF) of 0.83 can save about 25% on natural gas costs for water heating compared to a tank-style heater with an EF of 0.61. The average Wisconsin household spends about \$225\* per year on gas for water heating, and could expect to save about \$55\* per year (\*at \$1.12 per therm). Actual savings depend on the amount of hot water used, and only a few field studies have been published. The savings ranged from 10% to 30% in these studies. Madison Gas and Electric (MGE) customers can estimate the amount of gas they use for water heating by viewing their summer gas consumption online at: [https://www.mge.com/my\\_mge/login.asp](https://www.mge.com/my_mge/login.asp) Or, call our Home Energy Line at 252-7117 to have an energy advisor look at your bills and estimate what you spend on water heating.

## How much do they cost?

- Short answer; about \$1,000 more than a tank-style heater (installed).

If you replace an existing chimney-vented water heater with an on-demand heater that can handle two showers at once, costs are roughly \$1,800 to \$2,300 including venting and piping modifications. Installing an on-demand heater in new construction or an addition usually costs less because fewer modifications are needed. An on-demand heater that can only handle one use at a time costs about \$500 less than this, but these heaters may lack features found in the more expensive models, such as tight temperature control.

(continued on reverse side)

## Where can I buy one?

Some Madison-area plumbers now install on-demand water heaters. MGE recommends hiring a licensed plumber to install water heaters, whether tank-style or on-demand. Check in the Yellow Pages under Water Heaters or Plumbing Contractors. Dealer locators are available on the manufacturers' Web sites.

## Are rebates available?

- Yes, call Wisconsin's Focus on Energy at 1-800-762-7077 or visit [focusonenergy.com](http://focusonenergy.com) to see which models qualify.

## Are federal tax credits available?

- Yes, see [energystar.gov/taxcredits](http://energystar.gov/taxcredits) or call MGE's Home Energy Line at 252-7117.

## How do I compare efficiency? (Look for a high EF.)

You can directly compare the efficiency of on-demand water heaters to tank-style heaters. Look for the Energy Factor (EF), which is much like the mileage rating on automobiles. **The higher the EF, the more efficient the heater.** For example, MGE recommends an EF of 0.61 or higher on gas-fired tank-style heaters. On-demand heaters can achieve EFs above 0.80 on models without a pilot light.

## Sizing is important

If you're expecting to do two tasks at once (for example, showering and dishwashing at the same time), you'll need a heater rated at 175,000 Btu per hour (Btuh) or more. If you're filling a spa or hot tub, even these large capacity heaters may take a long time to fill the tub. You may need to install larger gas pipes within your house to handle the larger burners in these water heaters. Sometimes MGE needs to install a larger meter, but typically, no change is needed in MGE's underground gas piping serving your home.

## Barriers to installation

### Venting

Most on-demand heaters require special venting kits. If the existing heater is too far from an outside wall or

the vent could be blocked by snow, installing an on-demand heater may be impossible. Sometimes the cost of venting the heater correctly may be prohibitive. Manufacturers have strict specifications for correctly venting the exhaust. Sometimes it's not possible to find a legal location for the "vent termination."

### Piping

Less often, the cost of piping modifications makes an on-demand heater too expensive. Usually, modifying piping is cheaper than modifying venting.

### Potential problems

- Heaters can freeze if a damper isn't installed to prevent cold outdoor air from entering.
- On-demand heaters may lime up quickly if fed unsoftened water.
- Check the warranty. Some manufacturers won't cover problems caused by using well water or hard water.



Vent termination with backdraft damper

### Other Considerations

- Ask your installer about recommended maintenance and the availability of parts.
- A permit is required for replacing a water heater in most municipalities.

### Resources

- MGE's Home Energy Line at 608-252-7117
- MGE's water heater Web page: [http://www.mge.com/home/appliances/water\\_heaters.htm](http://www.mge.com/home/appliances/water_heaters.htm)
- Dept. of Energy - Demand water heaters: <http://tinyurl.com/a8ze3>
- National Association of Home Builders Research Center: <http://tinyurl.com/2akcoq>
- Journal of Light Construction-Installing On-Demand Water Heaters: <http://tinyurl.com/oyr2x>