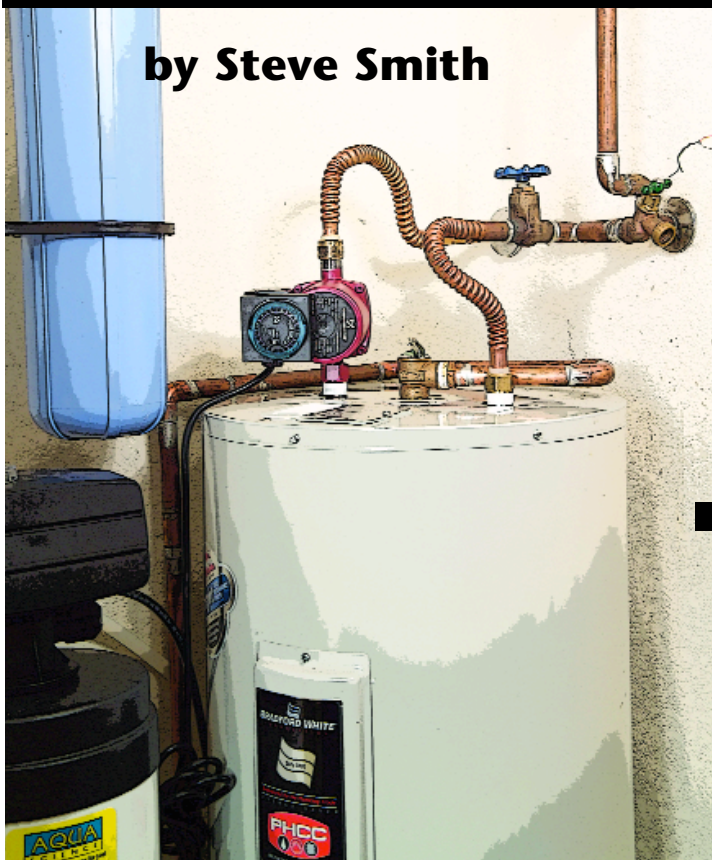


Why Wait For Water To Get **Hot?**

by Steve Smith

A family of four can waste as much as 38,000 gallons of water each year just waiting for hot water.



THERE'S A LOT OF BUZZ these days about hot water recirculation for domestic water systems. Not only does it provide hot water, but it also *conserves* water. That last reason alone might be a great selling point as more Americans take a "green" approach to their energy and water use.

Your customers may be so accustomed to waiting for hot water that they may not know there are better ways. Studies we've seen from various makers of recirculation systems say

Photos courtesy of Grundfos

Why Wait For Water To Get Hot?

a family of four can waste anywhere from 12,000 gallons to 38,000 gallons of water annually just waiting for hot water at points of use. When you think about it, water is just like any other commodity that gets marked up as it goes through distribution. First, homeowners pay to have it delivered, then pay to have it heated and then pay to have paid-for heated water go down the drain. Meanwhile, any hot water remaining in the pipes will cool off, and the waiting game starts all over again.

Water rates are rising across the country, and homes are getting bigger. So is the number of bathrooms in each home. Water rates, larger homes, more faucets and showers, longer water lines between the water heater and distant bathrooms, and you can see how the waiting game will take longer to play.

Hot water recirculation systems are ideally suited for new construction, where a dedicated return line can be installed before the walls and ceiling go up. But what about retrofits?

Grundfos was the first company to make a hot water recirculation system for existing homes or businesses. Unlike technology for new construction, the Grundfos Comfort System recirculation system for existing homes or businesses uses the cold water pipe as the return line. A non-electric bypass valve and a pump with a built-in thermostatic control and timer control water flow and eliminate the cold water runoff at the faucet or showerhead. The pump is installed at the water heater, providing the proper amount of pressure and recirculation required to maintain circulation.

Hot Water Help: Pennsylvania plumbing technician **Bob Sieger**, F.W. Behler Inc., York, Pa., recently installed the system for some homeowners who had tried another way to reduce the wait for hot water. The family constructed their 3,250-sq.-ft. home five years ago, and were dissatisfied with waiting for hot water at the most remote taps and showerheads, which in this case, were in the master bath. It's a 70-ft., 1/2-inch PEX tubing run from the indirect-fired water heater to the master bath. In the winter, that

amounted to a 90-second wait for warm water.

Two years ago, the homeowners saw a demonstration of a wall-hung, tankless water heater at a local home show. They decided on the spot that the unit would solve the problem in the master bath. The unit was installed at a spot in the basement, with about 15- to 20-ft. of PEX line from the master bath loop, and was dedicated to heating water just for that bathroom.

"Tankless units definitely are a reliable source of hot water that's produced quickly," Sieger said. "However, a lot of people think a tankless unit means instant hot water." Sieger added that it is confusing, since there certainly are instantaneous tankless water heaters that quickly provide hot water and are designed to be installed under sinks, for example. Whole-house tankless units are a related device, but won't necessarily provide the same performance.

The tankless water heater purchased by the homeowners was a microprocessor-based, high-efficiency unit, weighing only 15 pounds and capable of heating water at up to 14 gpm, a nice feature when heating the jetted tub. The wall-hung water heater was installed to preheat only the domestic water for the most remote bathroom — the master bath. It is set to activate when incoming water is less than 98 degrees F. When the incoming water reaches that temperature, it shuts off, permitting heated water flow to come from the boiler-heated, indirect-fired water heater, the home's primary source for heating domestic water.

Yet, there was still a 20- to 30-second wait for hot water as it quickly heats, and then courses its way from the wall-hung unit into the master bath fixtures. The husband was glad that the 90-second wait was trimmed to 20 or 30 seconds, but his wife wasn't enamored with the solution.

"The homeowner asked about that, and we reminded him that the wall-hung unit, though very reliable and responsive, was still some distance from the nearest master bath fixture, and it took time to evacuate that line," added Sieger.

Finding The Solution: Fortunately, Sieger had just spotted an advertisement for new technology that would, as a retrofit, recirculate domestic hot water without the need for a dedicated return line.

When the system calls for the water to be heated, the circulator pump turns on and moves the water through the water heater to each faucet, shower, water appliance, etc.

"There's a timer on the pump to make it more efficient during evening and mid-day downtime — homeowners can dial in what time they want the system to be operational," explained Sieger.

The unit begins working when the timer-activated pump at the hot water tank pushes hot water toward a valve beneath the furthest fixture in the house. The valve connects the hot and cold water supply lines.

As long as the water in the hot line is less than 95 degrees F, the valve stays open and the cold water is sent back to the heater through the cold water line. Hot water stands ready to come out when the tap is turned on.

The system operates because the pump creates a small pressure differential between the hot and cold water sides. A thin wax filament within the valve enclosure expands and contracts with perfect predictability, forcing opening and closing of the valve. It expands as the water temperature increases. At less than 95 degrees F, the valve remains open to permit circulation through the water lines. Then, at 95 degrees F, the wax expands to the point where the "recirc" valve simply closes, stopping circulation, and reopens when the hot water temperature dips below the device-activated 95-degree F setpoint. The flow is minimal. The pump moves water at one-tenth of a gallon per minute.

"So we did a bit of re-plumbing and installed the Comfort System with the pump connected to the indirect-fired water heater, and the valve below a sink in the master bath," Sieger added. "Now the homeowners have hot water in an instant throughout the home."

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