

# WATER CONSERVATION IN THE HOME

By Corey Gerlach  
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While the debate over increasing our local water supply and/or capacity rages on, we should continue the less contentious battle to conserve water. This article will focus on water conservation within the home.

The average American household uses about 146,000 gallons of water annually or 400 gallons per day; 42% of this usage is indoors. We can significantly reduce this usage by addressing the individual points of use (faucets, dishwasher, toilets, and laundry) as well as the piping system. Greywater systems, while worthy of consideration, are outside of the scope of this article.

The bulk of this water is going down the drain at the shower and sinks. Once we've decreased our shower times, water usage can be further reduced by the installation of low-flow fixtures. Newer fixtures are mandated by federal law to be low-flow; they are not mandated to be good. Cheaper units can be replaced with venturi-effect or aerating units that can reduce water consumption while feeling extravagantly wasteful. Look for shower faucets that deliver about 1.5 gallons per minute (gpm). Energy Technology Laboratories ([www.energytechlabs.com](http://www.energytechlabs.com)) and Bricor Conservation Products ([www.bricor.com](http://www.bricor.com)) produce well-received fixtures.

Are dishwashers more efficient than hand-washing? If you can wash a dishwasher load using less than 4 gallons of water, you can beat a newer dishwasher. The average person uses about 27 gallons of water for dishwashing. Look for an Energy-Star rated dishwasher.

And then there are the toilets, which account for 20-26% of indoor water usage assuming no leakage. Unfortunately, a study by the American Water Works Association found that 25% of our toilets leak, some squandering more than 500 gallons per day (gpd). Some toilets can leak up to 100 gpd without being noticed. Leakage can be confirmed by placing food coloring into the tank; if the coloring shows up in the bowl, the toilet leaks. Most toilets leak at the flapper, which is easily replaced. Beware of the generic flappers, however. A recent test showed that 85% of low-flow toilets equipped with replacement generic flappers averaged 2.9 gallons per flush (gpf) rather than the mandated 1.6 gpf. Match the flapper to the toilet brand and model.

It is best to replace older toilets (pre-1992) with a new low-flow toilet. While some of these toilets have earned their reputation for poor flushing, many more outperform the old 5-6 gallon units while using 1.0-1.6 gallons per flush (gpf). New toilet technology includes dual flush toilets that use 0.8-1.1 gpf for liquid waste and 1.4-1.6 gpf for solid waste. Pressure assist toilets using a flushometer tank can be very effective and less likely to leak over time, and that "whoosh!" sound is getting quieter. Top performers for flushing capacity include the Mancesa Cyclone at 1.0 gpf ([www.mancesa.com](http://www.mancesa.com)), the Toto Drake at 1.4 gpf ([www.totousa.com](http://www.totousa.com)) and the Toto Ultramax at 1.4 gpf. The Albemarle County Service Authority ([www.acsanet.com](http://www.acsanet.com)) and the City of Charlottesville ([www.charlottesville.org/utilites](http://www.charlottesville.org/utilites)) offer \$100 incentives to replace old toilets; other locales may offer similar programs.

In the laundry room, water conservation is best achieved by replacing the top loading washer with a front loading washer, which saves from 15-30 gallons per wash. The front loaders typically wash better, use less electricity, are gentler on clothes, and spin faster, which extracts more water from the clothes before they leave the machine.

Finally, how much water do we waste waiting for hot water? About 9,000 gallons per year per household. Such waste can be dramatically reduced in new construction simply by locating the water heater in a central location. More sophisticated systems may employ parallel or "home-run" piping rather than the branch or "tree" distribution commonly employed. While the tree distribution uses a large pipe from the water heater with several branches to each hot water fixture, parallel piping provides an individual small diameter pipe from each hot water fixture to the water heater, thereby greatly reducing the volume of water that needs to come through the faucet before hot water arrives. On-demand water heaters (a.k.a. tankless or instantaneous) are becoming increasingly popular because their small size allows them to be placed close to where they are needed, which reduces stand-by water losses. While more energy-efficient than standard water heaters, on-demand heaters are expensive to install.

A less costly and effective solution to stand-by water losses is to employ an on-demand hot-water recirculation system such as the Taco D'MAND system ([www.taco-hvac.com](http://www.taco-hvac.com)), which readily provides hot water and provides energy savings by recirculating warm water in the lines back to the water heater. This system should not be confused with a continuous recirculation system, its costly and energy-guzzling cousin.

Sources include Environmental Building News ([www.BuildingGreen.com](http://www.BuildingGreen.com)) issues 4/03, 5/03, 7/03, 1/04 and Home Energy ([www.homeenergy.org](http://www.homeenergy.org)) Volumes 20.6 and 21.5.

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