



Water-Saving Toilets

Water-saving toilets are now standard on all new construction because of a 1992 federal mandate for plumbing fixture manufacturers. Also known as low-flow toilets, water-saving toilets use 1.6 gallons per flush (gpf) of water or less, compared with older toilets that use 3.5, 5.0, and up to 7.0 gpf. The 1.6 gpf models significantly reduce the amount of fresh water consumed and the corresponding amount of blackwater generated. For example, using a 1.0 to 1.6 gpf toilet instead of 3.5 gpf models cuts indoor water use by more than 15%; when used instead of a 5.0 gpf toilet, it cuts water use by 20—25%.

Performance and Standards

The earliest models of water-saving toilets were introduced in the 1970s. Some have been notoriously poor performers, requiring multiple flushes to remove waste completely. Often, these early models were not engineered specifically to use less water, but were simply modifications to existing conventional toilet designs. By contrast, *high performing* low-flow toilets currently available are engineered to use less water and use it more powerfully. Today's high-performing models do remove waste as efficiently, or more efficiently, than conventional toilets while using much less water.

WaterSense has recently announced the first product specification that covers high-efficiency toilets (HETs)—those that use 1.28 gallons per flush (gpf) or less. WaterSense (www.epa.gov/watersense) is a voluntary public-private partnership program sponsored by the U.S. Environmental Protection Agency (EPA). With the announcement of the final HET specification, manufacturers, retailers, and distributors of water-efficient plumbing fixtures can use third-party certification to gain permission to use the WaterSense label on their products. In time, consumers will be able to recognize products with the WaterSense label as quality and high-performing water savers.

Choices

A variety of high-performing, low-flow toilets is available for residential use. Using different technologies, they provide a clean, efficient flush while meeting the 1.6 gpf maximum. The following is a rundown of the technology types with some benefits and drawbacks for each.

- Gravity-assisted toilet. When the toilet is flushed, the flapper valve in the tank allows water to flow from the tank into the bowl, where the water and waste are pulled down the drain by gravity. Gravity-assisted models typically are the least expensive type of low-flow toilets, and they are able to work with low water pressure. A drawback is that they have the weakest flush.
- Dual-flush gravity-assisted toilet. This toilet also uses gravity to remove waste, but it gives homeowners something more: one toilet with two flushing options. With the press of a button, a homeowner can choose a full flush of 1.6 gallons to remove solid waste or a half flush of 0.8 gallons to remove liquid waste. Relatively new to the U.S., dual-flush toilets have been widely used in Europe, the Middle East, the Far East, and Australia for years. While these have great water-saving potential, dual-flush toilets are currently the most expensive type of water saver.
- Pressure-assisted toilet. The line pressure of water entering the toilet tank compresses trapped air within a sealed tank, until air pressure equals water pressure. When the toilet is flushed, the pressure of the compressed air reinforces the normal gravity flow. This increase in pressure works particularly well to remove waste with low amounts of water, although pressure-assisted toilets can be noisy, expensive, and require frequent repairs.

- ▶ Vacuum-assisted toilet. Flushing this toilet activates vacuum chambers in the tank, which act like a siphon to pull water into the bowl. This design allows water to reach a greater area in the bowl, which keeps the bowl cleaner than other types of low-flow toilets. The vacuum-assisted toilet is quieter than pressure-assisted toilets, but the flush is weaker.

To learn more about water-saving toilets, visit:

www.terrylove.com/crtoilet.htm

www.purdue.edu/dp/envirossoft/watcon/src/waterst1.htm

www.awwa.org/waterwiser/watch/index.cfm#Watersense_toilet

www.rmi.org/images/other/Water/W95-36_WaterEff4Home.pdf

www.rmi.org/images/other/Water/W98-07_WatEffNxtGen.pdf