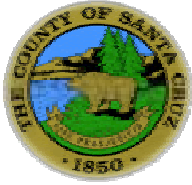


## Water Conservation Devices



# What To Know Before You Go Low-Flow

- » Selecting a Toilet?
- » Be Sure The Toilet Will Work In Your Building
- » Purchasing an ultra-low-flush toilet
- » Choosing a Licensed Plumber/Contractor
- » What should I know about maintaining 1.6 gpf toilets?
- » Disclaimer of Liability

### Selecting a Toilet

Not all ultra low-flush toilets are the same. The ultra low-flush toilet you would install in your multiplex, commercial or industrial bathroom will probably be different from the toilet you install in your home. You want to buy a new toilet and you want to make sure it works properly.

Toilets have two basic operational elements: (1) the intake of water used for flushing and (2) the discharge of wastewater. However, there are different types of toilets based on the way they perform these operations. You need to identify which type(s) of toilets are currently in your building and which is the most appropriate type to replace them with before you make a purchase.

#### **Gravity-Fed Tank Toilets:**

If you see freestanding water when peering down into the tank, your toilet is gravity-fed. Gravity toilets, which have a bowl and a tank, are the most common type of toilet found in residential settings but are in some commercial/business settings. They rely on the weight of the water and head pressure (height of the water in the tank) to promote the flush. They depend on the volume of water in the tank to flush wastes and usually require water pressure of no more than 10 - 15 pounds per square inch (psi) to operate properly. The tank and bowl are usually two separate pieces, although this is not obvious once they are in use. A few one-piece toilets are also available. Gravity tank toilets are relatively inexpensive, with retail prices for two-piece toilets ranging from \$75 - \$225 and one-piece models costing somewhat more.

#### **Wall Hung or Wall Discharge Toilets:**

This toilet is usually attached to the wall, rather than the floor. The tank can be either "exposed" outside of the wall or "concealed" within a 6inch wall. They can be either gravity or flush valve type toilets. Their prices start at around \$600.

#### **Two-button Flush Toilets:**

These innovative products offer two flushing modes – a half-flush (0.8gpf) for liquid and a full-flush (1.6gpf) for solids. Dual flush models have been shown to use less water than standard ULF toilets (DeOreo et. al. 2001).

[Water Savings](#)



### **Vacuum-assisted toilets**

One of the more promising developments in gravity-flush toilet design is the new vacuum-assist technology. Vacuum assisted toilets have been on the market less than one year. The system allows the toilet to give a complete, clean flush using only the rim holes inside the upper toilet bowl. When a vacuum assisted toilet is flushed, a vacuum is created which draws the water with more force into the bowl. There is no siphon-jet hole in this toilet. With all the water that is coming out of the rim holes, the bowl stays cleaner.

The downside to these toilets is they may require a second flush to evacuate everything, and to plunge the bowl, you must take the lid off the tank and hold your hand over an opening so that the plunging action works. The vacuum assisted toilets cost approximately \$100 more than gravity flush toilets.

### **“Pressurized Tank”, “Pressure-assisted” or “Flushometer” Tank Toilets:**

If old pipes are your problem, you may be interested in the power-assist toilets that many toilet makers now offer. These are toilets that use compressed air to force the waste down the trap.



If you look inside the toilet tank of a pressure-assist model there should be no freestanding water visible. The cylinder, along with the “roaring /whooshing” sound when you flush it, are sure signs of a pressure-assisted toilet. “Pressurized-tank”(“PT”), “Pressure-assisted,” or “Flushometer-tank” toilets look like regular gravity-flush (i.e., tank-and-bowl) toilets, but the usual porcelain tank contains a metal or plastic tank which holds water under pressure, pressurized by the building's own water pressure. When flushed, the pressurized water provides a rapid and powerful flush. The trapway (channel which carries waste from the bowl down to the waste line) in a PT toilet is just as large as the trapway in a 3.5 or 5-gallon toilet, thereby virtually eliminating the problem of clogs.

Flushometer valves are typically made by one manufacturer and the china bowl by another. Unlike tank-type toilets, flushometer valve toilets must accommodate different water pressures at different points in a building. Pressure-assist toilets require a minimum water pressure of 25-40 psi to operate well. It is very important that there is a proper match between the valve and the bowl when purchased.

One benefit of a power-assist flush is that the water is contained inside the pressure tank, which is inside the china toilet tank. That insulation results in little or no tank sweating. Drawbacks include noise and price: Power assist generally adds \$ 100 or so to the cost of a toilet.

### **Flush Valve Operated Toilets:**

This is the type of toilet usually found in many public restrooms. These toilets have no tank. They have what looks like a standpipe located behind the toilet seat, with the flush valve located inside the top of the pipe. Instead of a storage tank, this toilet uses a valve directly connected to the water supply plumbing of a building. This valve controls the quantity of water released over time by each flush.

## **Be Sure The Toilet Will Work In Your Building**

### **Pressure**

While true gravity tank toilets will operate at water pressures of only 10 - 15 psi, pressure-assist tank and flushometer toilets usually require 25 - 40 psi and, sometimes, even more. This is the pressure at the toilet, not the pressure coming into the building. If you are considering pressure-assist tank or flushometer models, be sure to have your plumber or consultant survey pressures throughout the building. Buildings with roof tanks or buildings that depend on street pressure may have lower pressure on the upper floors. Make sure your building's pressure is adequate before switching from a gravity type toilet to a flush valve type toilet.

### **Noise**

Listen carefully to the noise level of the toilet models you are considering. Some are quieter than others. This is especially important for situations such as apartment buildings with shared walls.

### **Building Pipes**

If your building has had previous problems with clogged or improperly pitched drain lines or a bad venting system, these problems should be addressed as part of any toilet replacement program. The installation of new low-consumption toilets may exacerbate previous waste line or venting problems. Have your drain line slopes checked before replacing the toilets.

## **Purchasing an ultra-low-flush toilet**

See H2Ouse.org's toilet [purchase tips](#) and the National Association of Home Builders Research Center [low-flow toilets performance test](#) results.

## **Choose a Licensed Plumber/Contractor and Review a Work Proposal**

Ask prospective plumbers to perform a pre-proposal inspection of your building's restrooms and related plumbing prior to your selection. The proposal should include any accessory jobs that need to be part of the project and any extra work items that could develop during the job (see: "[Anticipate Possible Additional Work Required](#)" under Purchase Tips). The proposal should also include the total number of hours, the plumber's rate per hour and an itemized list of direct expense costs so that a comparison between proposals can easily be made

## **What should I know about maintaining 1.6 gpf toilets?**

The flapper on most 1.6 gpf toilets is very inexpensive and likely will last only 6 months to two years. A good quality replacement flapper should be purchased and will likely last as long as 5 years. Korky is one company that specializes in 1.6 replacement flappers that have a five-year guarantee.

There are some 1.6 toilets that have a specialized early closure flapper that must be replaced with the same type of flapper in order to maintain the flush volume at 1.6 gallons. If a generic flapper is used, the flush volume could increase to 3 to 4 gallons per flush, greatly increasing your water bill. Peerless is one manufacturer that has toilets that need these specialized early closure flappers.

### **DISCLAIMER OF LIABILITY**

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