# The Well-Tempered Toilet

by Randy Teets

The phone calls usually start around the end of June. After a run of two or three hot, humid days, there will be a couple of messages on my answering machine asking me to come out and fix a leaking toilet.

When I arrive, the customer points at the damp bathroom floor and tells me his or her toilet is leaking. More often than not, I discover that the toilet isn't leaking, it's sweating. Condensation (the correct term for what's taking place when a toilet sweats) will form on the outside of a freshly flushed toilet as the cold refill water contacts the room-temperature porcelain surfaces of the toilet.

If the customers have difficulty understanding the underlying physics of condensation, I ask them for a cold glass of water, and set it on a table for about five minutes. Seeing is believing: When I pick up the glass and point to the wet ring that forms on the table, they begin to understand why their bathroom floor is wet.

The puddle that forms around the toilet is more than just an eyesore. Mold can thrive in these damp locations, and moisture that works its way into the subfloor can set up a rotting process that may slowly transport the toilet into the basement.

Insulating the toilet tank is a strategy that's touted as a cure for sweating toilets. Most manufacturers offer toilets with factory-insulated tanks, and I've seen various retrofit insulation kits for existing toilet tanks. The trouble with this approach is that insulating the tank does nothing to prevent condensation from forming on the toilet bowl or the incoming supply line.

## Installing an Antisweat Valve

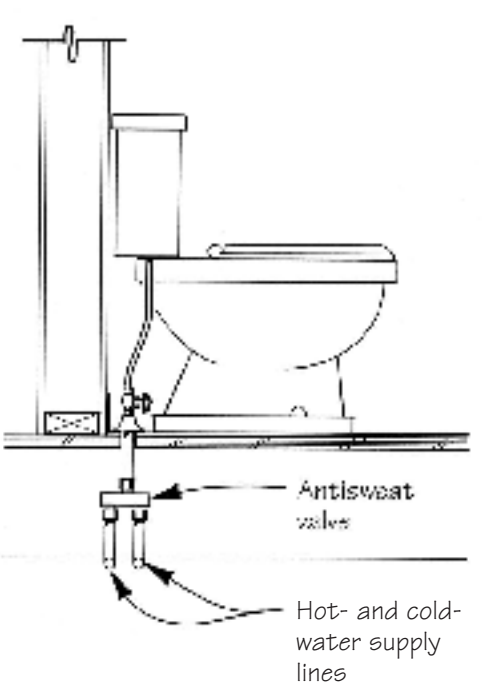


**Figure 1.** An antisweat valve installs easily by interrupting the existing cold-water supply line and running a hot-water line to the valve. The valve may be installed in any position, and can be located behind a partition, or below the floor, as shown.

## Warming the Refill Water

To effectively prevent condensation from forming on the toilet and supply lines, the temperature of the refill water must be raised to near room temperature, or "tempered." There are two types of antisweat tempering valves designed specifically for toilets: adjustable temperature and fixed temperature. These valves can typically be purchased for around $30.

Installation is the same for either type valve. I interrupt the cold-water line that supplies the toilet and connect the line from the toilet to the center shank of the antisweat valve. Then I connect the service side of the cold-water line to the appropriate shank on the supply side of the valve. I tap into a nearby hot-water service line, connecting it to the remaining valve shank (see Figure 1, previous page).

**Figure 2.** Antisweat valves are available in two styles: adjustable (above) and fixed temperature (top), which the author prefers.

Universal-Rundle (see manufacturers list at end of article) makes an adjustable antisweat valve (Figure 2, above). Two adjustment screws control the amount of hot and cold water being mixed together to supply the toilet. The valve can be turned off when the weather is cooler and less humid.

While adjustable-style valves offer the advantage of being able to turn off the hot water, they also contain rubber O-rings. If these O-rings deteriorate or fail, you've got a leak to fix. I've also noticed that after an adjustable antisweat valve is installed, it's more often forgotten than adjusted. It takes a compulsive personality to make sure that an antisweat valve adjustment is included on the spring and fall to-do list.

I prefer to install the fixed temperature style valve made by Beacon Valves. The mixing temperature is preset at the factory, and there are no internal seals that can fail. The fixed temperature valves tend to be smaller — an important point when retrofitting a valve in a confined area.

## Energy Costs

I'm often asked about the "energy penalty" of supplying a toilet with tempered water. The answer depends on a number of factors: the amount of water per flush, the incoming temperature of the domestic water supply, and the type of water heater. My best guess puts the cost at less than a penny per flush. A therm of energy (100,000 Btu) costs about a dollar in my area (depending on the fuel), and it takes about 320 Btu to raise two gallons of 50°F water up to 70°F. I've replaced enough rotted bathroom floors to recognize a bargain when I see one.

One last note: A sweating toilet *can* be cured without using an antisweat valve. I remember hearing of one person who decided to plumb the toilet by tying the toilet supply line directly to a hot-water supply pipe. This strategy prevented condensation from forming, but created quite a steamy sensation when the toilet was used. An antisweat valve was eventually installed.

***Randy** Teets is a veteran plumber from South Montrose, Pa.*

### Antisweat Valve Makers

**Beacon Valves**
2 Jackson St.
Waltham, MA 02154
617/893-0011

**Universal Rundle Corp.**
217 N. Mill St.
New Castle, PA 16103
800/955-0316