

Ask Jon Eakes

Why do I have condensation on an insulated toilet tank?

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Geoff lives in Newfoundland and is frustrated that he has condensation on his toilet tank every spring despite the fact that it is insulated.

Well Geoff, the fact that you live in Newfoundland helps to answer the mystery. Any time you see condensation, on a toilet tank, a window or a beer mug, it is a combination of the level of humidity in the air and the temperature of the surface. We can get condensation on a window even in a fairly dry house if it is extremely cold outdoors and the inside part of the window is colder than normal. We can get condensation on water pipes in the basement in the middle of a hot summer, simply because it can be extremely humid and the pipe is just a bit cooler than anything else in the room.

TOILET LINER

So why would Geoff's toilet tank, which is not supposed to sweat because of that insulated liner, collect condensation only in the Spring? Well, in the winter the water in the tank is cold, but the air is dried out by the heating system. In the Spring, the water, coming out of the underground piping, is still the same winter temperature, but the air is far more humid, and you may not be heating at all. As you know Geoff, coastal climates can be wettest in the Spring and the Fall. As summer rolls around, the air is less humid, and the water is warming up.

THE SCIENCE SOLUTION

The solution to all condensation problems is to either raise the temperature or lower the humidity or a bit of both until the condensation goes away. That insulation in the tank was supposed to raise the temperature of the outside of the tank, but it isn't doing enough. You could add more insulation, literally gluing foam insulation to the existing insulation. But few new tanks have insulated liners as with the advent of low flush toilets there is another way to control this -- to lower the temperature of the water in the tank.

TANK WATER LEVELS MODERATES WATER TEMPERATURE

Low flow toilets, or adding a "Dual Flush" mechanism on an old tank, gives an interesting temperature regulator to all of this, most of the time. There is almost as much water in the tank with a low flush mechanism as with the old full flush mechanisms. The reason that the volume of the tank has not changed much with the advent of the low-flow toilet is that we need the height of the fall of the water to be about the same to create the necessary force to flush everything through the bowl. The difference is that each flush removes less water from this reservoir, leaving lots of room temperature water behind. The new very cold water refills the tank after a flush but the mixture of the two keeps the tank temperature below what would cause condensation on the outside of the tank. Now, if there is a long line-up at the toilet in the morning and repeat flushing is too frequent, this could get cold and you could get some condensation on the outside, but that usually is a short event and it all dries out. Increasing the ventilation in the bathroom and forcing it to draw its air from the house rather than from the bathroom window will bring dryer, warmer air into the bathroom.

This is usually a marginal problem, and any of these efforts could be enough to tip the humidity scales into your favour.

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