



Condensation Of Electric Water Heaters

On occasion electric water heaters returned under warranty leaking do not leak on hydrostatic testing. What fools many homeowners and servicemen? Condensation.

We have all seen the condensate which forms on a glass of ice water on a hot humid day. Similar to when the first tank of cold water is heated, the same condensation can develop when a water heater is undersized or overdrawn. The thermostat demands heat and the electrical heating elements heat the cold water which has entered the tank. If the water heater is large enough, the mixing action of the cold water inlet and the existing water temperature in the tank will not drop to the point where it cools the interior tank surface to the point of condensation.

Interestingly, the majority of 'nonleaker' returns are found to have been replaced during the winter and early spring months when incoming water temperatures are at their lowest. Cold water inlet temperatures can vary in excess of 30° F between seasons.

While attempting to verify a suspected leaking water heater, first take a good look at all the fittings and attachments to the tank. Check for condensation on the cold in and hot out supply lines and the tell tale signs of evaporated water around the fittings and outer jacket of the heater. Also check the pattern of the water that has pooled into the drain pan. Normal condensation will accumulate and then evaporate. A leaking tank will always leak - leaving larger accumulations of water with little time to evaporate.

While all water heater have some degree of condensation, excessive moisture on the outside of the tank can cause premature tank failure or shorting of electrical components. Premature exterior corrosion of the water heater tank and corrosion of the thermostat and heating element fittings are some of the problems caused by excessive condensation. The moisture in the atmosphere next to the tank can also corrode the electrical contacts inside the thermostats. This may cause erratic heating cycles as the contacts operate.

How to fix the problem

First, this is not an easy solution. It is prohibitively expensive to control the atmospheric humidity inside a water heater closet, wash room or the entire home. In fact, some humidity is desirable inside a home.

Second, accept the fact that some water heaters in some homes will produce visible condensation. If you think your water heater has a condensation problem, try looking at your toilet bowl tank and the lower corners of your windows. Chances are they will also be condensating for the same reasons as the water heater.

Finally try these tips:

A water heater must be of sufficient size to meet the homeowners demands for hot water. Homeowners will over draw an undersized water heater to the extent that the tank is constantly heating and cooling. Recall our glass of ice water? The same thing happens on the outside of the heater tank. The condensation rolls down the side of the tank and collects in the drain pan. Looks like a leaker, but is really condensation. If purchasing a larger capacity heater with a higher recovery rate is not the best solution, try to adjust your usage patterns. Spread out your hot water usage over longer periods of time. Turn on your dish washer before you leave for work; wait 30 minutes or an hour between showers; and use the cold water cycles on you clothes washer.

Try to increase the air flow or venting (drafting) around the water heater. Bathroom vents installed near the heater may work; open the home's heating and cooling vents in the room with the water heater or install door mounted vents to increase the air flow around the heater.