



**Anode Rod.** The anode rod is a sacrificial metal rod that helps reduce corrosion and premature failure (leaks) in the tank. The anode rod is a consumable item.

## Sections from A.O. Smith Tech Center Bulletin 61:

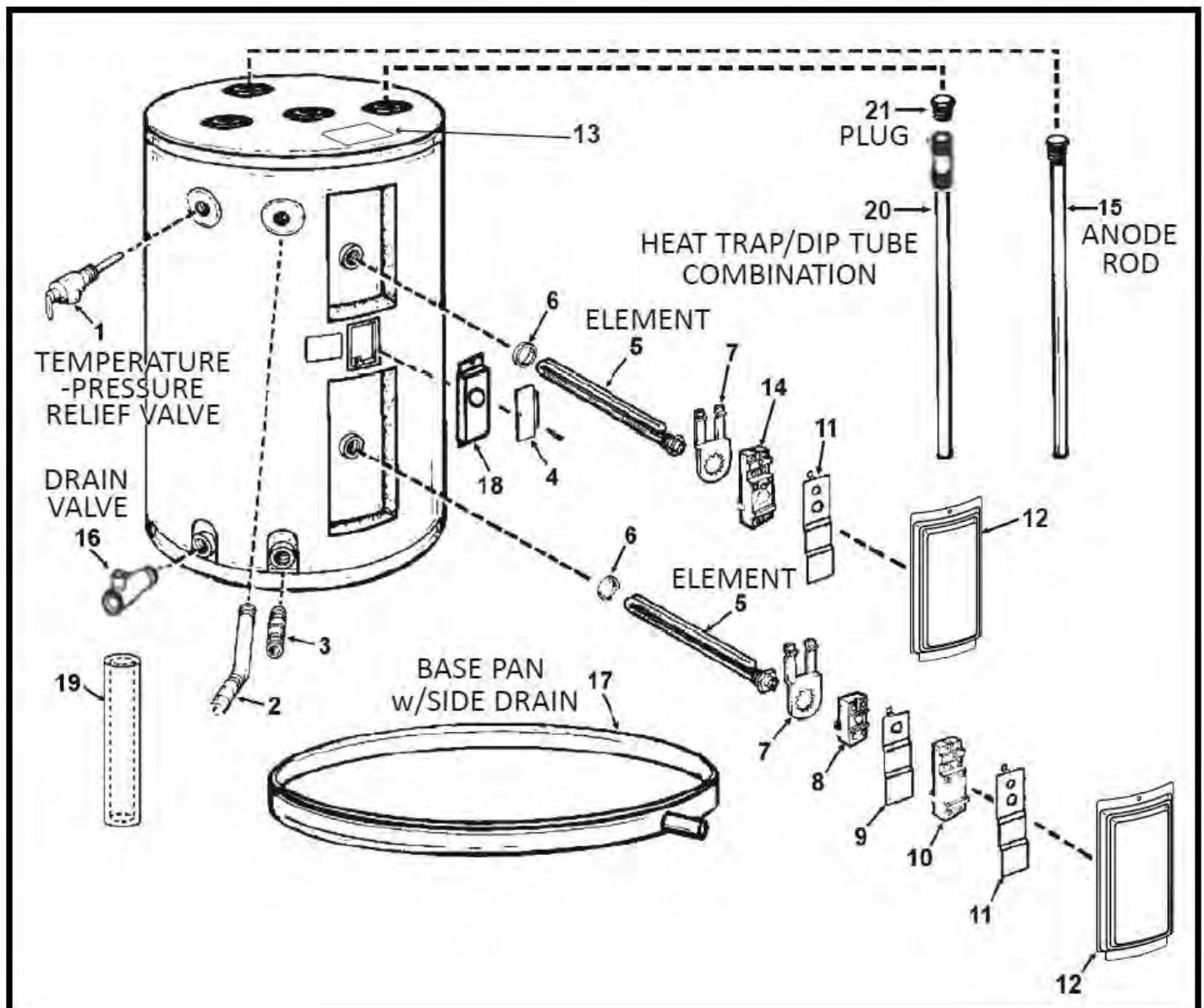
The use of water softeners in hard water areas and even moderately soft water areas is becoming a common occurrence. This practice has a potentially detrimental effect on the performance of the anode in the water heater which can cause a reduction in the life of the water heater.

The water softening process can cause problems. Several effects on the water heater are described below:

- Sodium reduces the hardness of the water but it does not reduce the conductivity of the water. Excessive conductivity in the water will accelerate anode performance resulting in more rapid anode consumption.

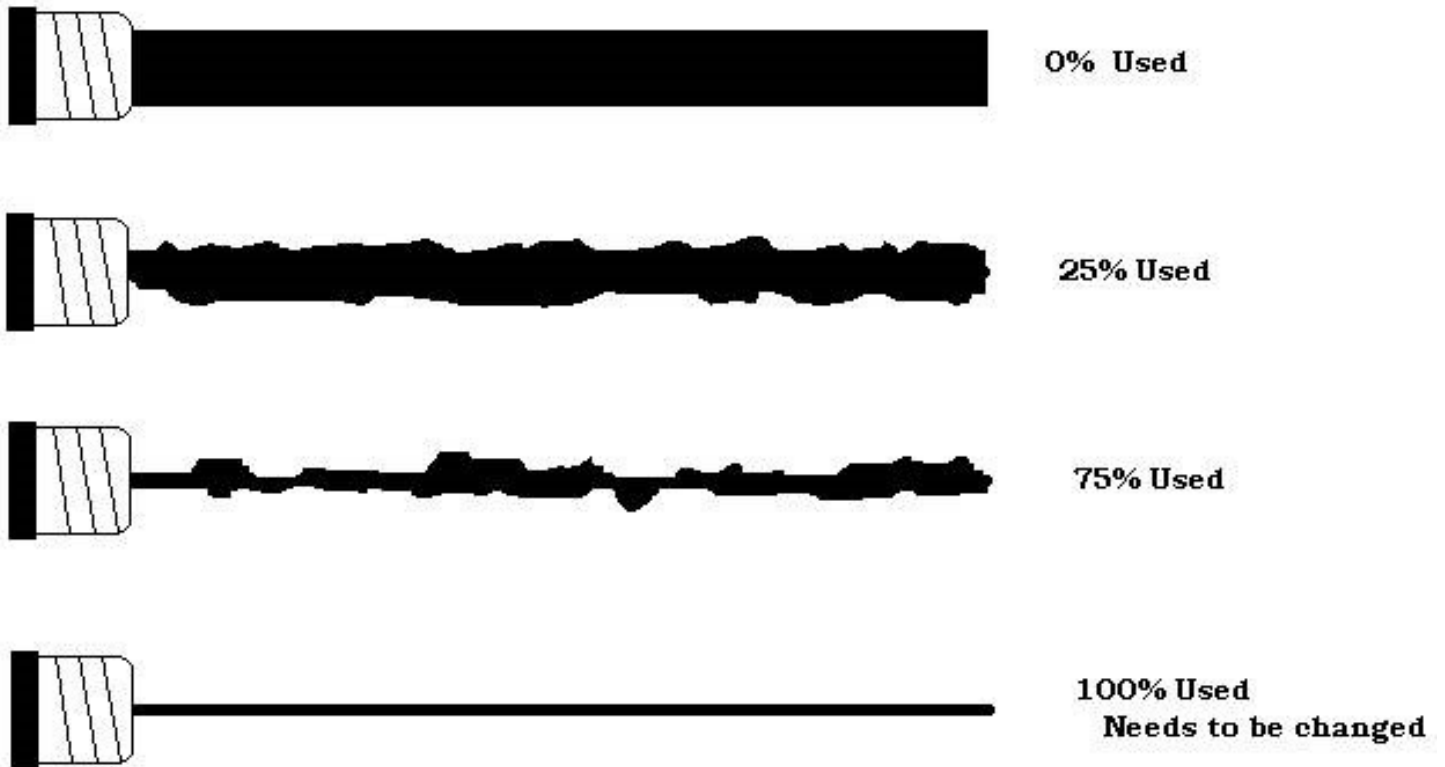
- If the resin bed of the softener is not properly rinsed after recharging with salt, residual salt will get into the water heater. This will increase the conductivity of the water and result in more rapid anode consumption.
- Water softeners accelerate anode consumption because they eliminate the formation of scale in the water heater tank. Light scale formation in a water heater is desirable since it forms a barrier film on the exposed steel surfaces in the tank such as pipe connections and weld areas. Corrosion cell tests at the Corporate Technology Center have shown a steel corrosion rate drop of 33% with the formation of a thin (<1/16") film of scale after only three weeks in moderate conductivity water (17 grains hardness).

Customers using water softeners should expect more rapid anode consumption. Anodes should be inspected more often and replaced when nearing the end of their useful life.



Typically, the **anode rod** screws into the top of the hot water heater. Paste should be used to seal the threads instead of Teflon tape, because metal-to-metal contact is important to the anode rod's performance.

## Another illustration of anode rod degradation:



## Quote from a very educational article entitled, “Replacing anodes, getting rid of odor” published on 10/11/11:

“It’s notable that the water heater manufacturers view the anode as tantamount to the warranty. A six-year warranty water heater usually comes with a .75-inch diameter anode; a nine-year has a .84-inch diameter anode; and a 12-year has either a .90-inch anode or a .75-inch hex anode in its own port and a half-length .75-inch combo rod in the hot port.”

**Bottom line, if you have a water softener, your water heater is not going to make 6 years. Two Verona residents that I know of already had their tank rust through. The anode from the most recent failure was 100% consumed and looked exactly like the “fully depleted” one shown at the beginning of this document. That home closed on 9/15/16 so the tank was just over 3 years old.**

**Jim Sears, 12/30/19**