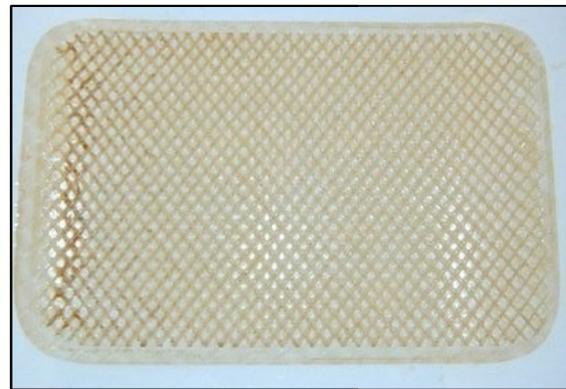


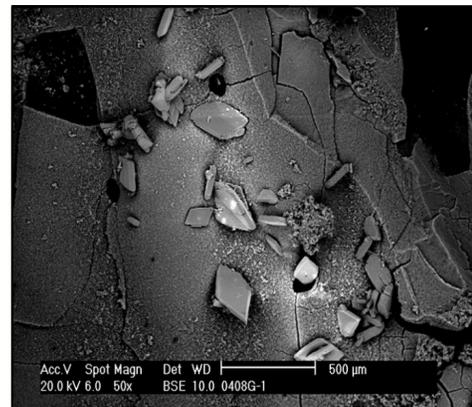
## A Water Softener Alternative for the Prevention of Scaling in Reverse Osmosis Systems

In any membrane filtration system scaling is inevitable. Scaling is the accumulation of salts and particles on reverse osmosis membranes. There are many forms of scale, some of the most common being calcium carbonate, calcium sulfate, barium sulfate, and strontium sulfate. Ions draw together like a jigsaw puzzle and begin to crystallize, pushing water away. As water is pushed away the crystal becomes solid and eventually attaches to the membrane. Left unmanaged the crystal scale will accumulate and become a mass of crystals on the surface of the membrane, causing blockage. This is harmful to the reverse osmosis system because it will increase the operating pressure. High pressure can put stress on the system and reduce product output and efficiency levels. A severely scaled membrane can easily reduce its gallon output by more than half.



In general, reverse osmosis systems operate by having the water forced through a membrane that is located inside of a pressure vessel and is pressurized. The water that is pressurized will permeate through the membrane and exit as the product (permeate) water. The water that does not permeate through the membrane will become concentrated with impurities and is normally called the waste water. The high concentration of ions coupled with the high pressure in the pressure vessel will eventually give rise to scale formation. This is where preventive measures become crucial.

There are many ways to prevent scale from forming, one of them being the traditional water softener. However, with membrane chemical technology advancing, new and improved antiscalants are being offered into the marketplace. An antiscalant is a chemical formulation that is fed into the feed water treat of the reverse osmosis system. The antiscalant works in the form of crystal modification, thresh-hold inhibition and dispersion. Crystal modification will distort crystal shapes resulting in soft non adherent scale. As crystals form the antiscalant destroys the positive charges of the scale nuclei interrupting the electronic balance necessary to propagate crystal growth. Thresh hold inhibition and dispersion work in a similar fashion. All in all, the main function being to disrupt ionic charges and cause ionic repulsion.



The advantages of using an antiscalant is that it is effective, cost efficient, larger range of treatment, involves less maintenance and is environmentally friendly. In addition, it allows for repeat business as it is a consumable and does not allow the individual servicing the system to purchase bags of salt at the local hardware store. This means that the re-occurring revenue stream from this product will be directed back to you, since this item normally cannot be sourced locally.

Antiscalant is recommended for treating scale as it is a simple process and is a better investment than water softening. It is necessary for the prevention of scale formation inside of reverse osmosis membranes.