

Ask Jon Eakes

Softening water -- do electronic water softeners work?

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John from Halifax wrote in asking about replacing his salt based water softener with an electronic water softener to make it easier to water his lawn.

Note 2020: I originally wrote this article in 2004 and many products have come and gone since then. I recently received several requests to link to further information -- which I rarely do. One real estate company in Virginia surprised me with a very good overview of what hard water means to a homeowner. As realtors, they are not trying to sell any water treatment devices, just inform homeowners about hard water. Click here for Your At Home Team's "Hard Water Guide". I also got a request from a US water treatment information website to link to their section on water softening: www.best-osmosis-systems.com. With "best-osmosis" in their web name I expected to find a fluffy site covering a blatant sales pitch for a system of reverse-osmosis. I was surprised to find a very competent and objective exposition of all the water softening systems and even evaluations of specific systems -- no mention of reverse-osmosis. So I dug further into this extensive site to discover their home page is a section explaining and evaluating systems of reverse-osmosis -- as well as sections on all kinds of other water treatments. Given that Canadian water has much the same variations as US water except for significant temperature differences, and many US products are not available in Canada -- read my overview on softeners below and if you want to dig much deeper, an hour on these websites would be time well spent. - Jon

Ion-exchange with salt will soften water

Most of our water softeners add salt to the water in a process called ion exchange. This actually changes the chemistry of the water, changing the harsh minerals in the water, usually calcium, from affecting the way that soap acts to get things clean. Softened water is easier on the skin, but hard on plants because of the salt. Most people will install a cold water by-pass to provide untreated cooking water, drinking water and even the outdoors hose bib. That simply requires tapping off some water before the connection to the water softener.

Others use an alternative scheme and only soften the water heading to the hot water tank, leaving all the cold water in the house untreated. If you always clean with at least some hot water, that works fine, uses less salt and does not affect the plants.

But John was asking about electronic water softeners. Are they real?

Magnets can prevent calcium deposits

There is a long standing and well proven technology of submitting water to very large magnetic fields by running the water through special magnets. This does not change the chemistry of the water at all, but simply stimulates the mineral molecules so that they remain in suspension for about 72 hours, meaning that they won't stick to anything as calcium or lime usually does, and by 72 hours the water has gone through your house. Water with calcium in suspension is considered "soft water" and allows soaps to act normally. Industrial sized magnetic conditioners will actually cause old accumulations of calcium to come loose and end up cleaning out the system. The problem is that most magnetic softeners made for the domestic market are far too small, and those that are large enough, like the one I showed on the show, didn't make it commercially because they tended to plug up often. These smaller magnets had to slow down the water while it was in the magnetic field so they had very small passageways which plugged up. Commercial ones work because they are simply very much larger. A couple of little magnets strapped onto a pipe are useless gadgets. So the technology is good, but its application to a home is problematic.

Electro-Magnetic devices do not block water flow

Electronic water softeners are actually breaking into the residential market with some legitimate products because they can create a strong electro-magnetic field without restricting the flow of water. The of the early models that have shown some results in residential water systems are one shown above called Clear Wave made by Field Controls Inc. Another credible model is called ScaleBlaster from ClearWater Enviro. The red antennas create a strong magnetic field of varying frequency over several inches of water flow. It is not the strongest or most effective of water softeners but it is economical.

More recently HydroFlow has produced a different technology that appears to be working better than all the rest. They send a very strong 150kHz frequency which propagates throughout the plumbing system. The unit simply straps onto the main water supply pipe and plugs into a 110v outlet. A full explanation of how their "HydroPath Technology" works can be found on the bottom of their website home page. In my testing I could detect that signal throughout the piping of the house – but since I am a person concerned about electromagnetic waves in our living space, I was delighted to see that I could not detect the signal 6 inches away from any of the pipes. The signal does indeed flow through the water, with copper or plastic piping, but not all over the living space. The manufacturer also claims that these devices will clean out biological pathogens, and that the signal will travel back down the water pipe to a well system and sanitize the well. I believe their story but have not confirmed it with tests myself. They make two units sized for residential use, and many more for industry.

One catch is that if there is a lot of iron in your water, none of the magnetic or electronic softeners will work well. You always need to test your water before choosing any water treatment or filtration device. One long term test to see if they are working well is to see if your shower heads still clog up with calcium, or perhaps even get very slowly cleaned by the flow of this water that is pulling calcium into clusters. I have not had to clean my shower head since I installed a HydroFlow and I can say that 4 years after installation, it is working better than any other device I have tried to date.

Aside from long term observation, how do you tell if a system works on hard water? Take separate water bottles and put a small measured amount of soap into each. Half fill one with untreated water, as in the centre bottle above, and shake. The bottle on the left is the same water softened by ion exchange, making about twice as much suds when shaken. The third is filled about 3 days after installing the electronic device, giving suds someplace in-between the hard water and the regular water softener. You want to wait three days because it can take water up to 72 hours for water to flow through your house, and you want to be sure the water you are testing has gone through the device you want to test. So the electronic water softener is not doing quite the same job as a salt based water softener with this homeowner's water supply although it is definitely softening the water, but there are no continuing salt costs, no maintenance and no problems watering the lawn.

What magnets will NOT do

One caution: magnetic systems will not remove iron or any impurities. They are not filter systems. They do not add anything to the water -- like salt that can cause problems with plants or with down stream water systems. They only put whatever calcium is already in your water supply into suspension long enough for it to get used or flushed through your house. They don't make "soft water" with that slippery sensation in the shower common with ion-exchange systems, but if strong enough, they can eliminate or reduce your "hard water".

Test your water to know what you need to accomplish

Testing your water is the first step in making it better -- especially true when choosing water filters. Bottom line? Magnetic and electronic water conditioning can be legitimate if the mineral composition of your water is appropriate for their use and the units are sized for your water flow. Actually, in industry they often treat the water with magnets before sending it through an ion exchange unit, the end result being the soft water they want with far less use of salt. But the water softening industry doesn't want to encourage lower continuing revenue, so they don't size their residential units to work in tandem with magnetic or electro-magnetic systems.

With the exception of one specific electromagnetic conditioner mentioned on www.best-osmosis-

systems.com, I am sorry that I know of no objective listing of just which systems would work well with different types of water, or a rating of which work better than others, or even a good listing of what is available, although stories I have received indicate that price does appear to have a direct correlation with the strength and effectiveness of the field.

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