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# Take Your Pick

Traditional & non-traditional technologies provide variety of choices for water conditioning

By Susan White

**W**ater conditioning has become a nebulous term over the years. To customers, it may mean softening, filtration, scale prevention, contaminant removal or all of the above. In modern water treatment, though, it is the term used when there is a need for scale control and prevention. With the complexities of water quality, increasing contaminant issues and differing

opinions on technologies, it has become harder to define what types of systems are included under the umbrella of water conditioning.

## **Water Conditioning for Scale Control**

In regard to scale control and prevention, there is a general consensus it is divided into two categories: traditional and non-traditional. Traditional water conditioning has

enjoyed a long-standing track record—polyphosphates date back to the early 19<sup>th</sup> century—and includes proven and tested methods, such as ion exchange water softening, polyphosphate scale inhibitors and oxidation-reduction.

Ion exchange is the go-to method for water softening, but it has come under fire for wasting water and discharging salt into the environment. Consequently, manufacturers are developing improvements to increase efficiency and reduce these impacts. According to the Water Quality Assn., “A 2009 study commissioned by the Water Quality Research Foundation and conducted by the Battelle Memorial Institute found that adding a water softener helps water heaters and major appliances operate as efficiently as possible, while preventing clogs in showerheads, faucets and drains.”

Phosphates as a reliable scale inhibitor water conditioner include crystallized forms, as well as a more recently developed version called Siliphos. According to Aquachemix, the U.K. agent for Siliphos for the past 40 years, it acts as a “threshold inhibitor” in sub-stoichiometric amounts, stabilizing water and preventing CaCO<sub>3</sub> scale from forming. As a guideline, it can prevent CaCO<sub>3</sub> scaling up to a water hardness of 360 ppm CaCO<sub>3</sub> and withstand a water temperature up to 80 °C by sequestering hardness minerals and preventing the formation of limescale deposits.

Oxidation-reduction is accomplished with media consisting of two dissimilar metals, such as KDF process media. KDF Fluid Treatment LLC’s combination of copper and zinc creates an electrochemical reaction. During this reaction, electrons are transferred between molecules, changing some harmful contaminants into harmless components.

In a 2005 WQP article, TowerKlean LLC, a commercial and industrial water treatment system manufacturer, said it uses KDF process media largely because it eliminates the need for corrosion control chemicals. “With the reaction of the KDF media, we are able to modify the crystal structure of the scale compound (calcium carbonate), changing it from calcite to aragonite,” said Harry Manvel, sales manager for TowerKlean at the time of the article. “In this modified form, aragonite is suspended in the water until removed by the filter. As the filter backwashes, the scale is literally flushed down the drain.”

### Today’s Less Traditional Methods

The non-traditional or physical water conditioning category has grown tremendously over the past 15 years and evolved into more environmentally conscious treatment systems. Consumers are demanding alternative options, and the industry has delivered. These systems

include technologies that alter the molecules of the minerals through nucleation-assisted crystallization (NAC) or template-assisted crystallization (TAC), hydro-magnetic systems, and other electronic scale control technologies. Although many water professionals are skeptical of the benefits of these systems, studies have

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been conducted on some to prove their efficacy.

TAC and NAC are physical water treatment technologies using similar media. They do not soften water and are not "salt-free" water softening technologies. They do not change the hardness of the water. Small, specially treated polymer spheres convert dissolved hardness into microscopic crystals. Once the crystals grow to a certain size, they are released from the bead. The crystals are relatively insoluble, effectively isolating calcium carbonate from the water chemistry and anything the water contacts. Look for polymer bead media certified to NSF/ANSI Standard 61.

The popularity of TAC and NAC has risen over the past 10 years due to increased awareness and consumers' desire for more environmentally friendly options. The elimination of electricity, salt, water waste and maintenance combine to make this type of technology suited to residential applications. The flexibility of these media allows them to be used in a

mineral tank- or cartridge-style unit.

Hydro-magnetic and electronic systems also are included in the non-traditional water conditioning category, but their effectiveness has not been proven. Using powerful neodymium magnets, hydro-magnetic devices claim to change the molecular structure of minerals in the water, stopping them from adhering to pipe, heaters and fixtures. Magnetic water conditioning is not new and was first developed and patented in the late 1800s. Electronic systems make similar claims of altering the structure of the minerals to provide scale-free results.

### A Variety of Choices

While traditional ion exchange systems have been specified for decades, the alternatives have increased the available choices for water conditioning. Some traditional and non-traditional systems specifically used for commercial applications in the past are now being re-invented. Multi-tankless water heater racks

now are being utilized in place of boilers for some commercial applications and where water softeners always were specified. For this application, cost-effective systems such as ScaleZERO employ less expensive Siliphos scale control in a stainless steel vessel configuration, while United Filters' NO-SCALE and Impact Water Products' Scaliminator offer Siliphos scale inhibitor cartridges for smaller poly housings. NAC and TAC are being utilized in an array of residential and commercial applications, sold by distributors such as Impact Water Products, Good Water Warehouse Inc. and WhiteWater Concepts.

### Putting the Customer First

Whether recommending traditional or non-traditional water conditioning systems for customers, truth in representation and distinguishing terms to better educate are the most critical factors for growth and expansion of these technologies. There are disreputable companies in the marketplace today misrepresenting their

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systems as “softening” systems, or selling products that are not suited for the specific application. The liabilities can be huge, and therefore OEMs, distributors and dealers should err on the side of caution when selecting water treatment solutions. All water treatment professionals should be transparent and factual in their representations. It is only then that consumers will be able to trust and rely on these professionals to provide effective water treatment solutions. **WQP**

**Learn More:** Industry experts Jerry and Allan Horner of Impact Water Products share advice on water conditioning technologies in an exclusive interview at [www.wqpmag.com/softening-conditioning-choosing-right-technology](http://www.wqpmag.com/softening-conditioning-choosing-right-technology).

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