

WATER CONDITIONING TREATMENT SYSTEMS AND MAINTENANCE

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What is water conditioning?

Water conditioning is the process of removing or altering minerals, chemicals and contaminants from a water source. Most residents in our area use private or public wells or reservoirs as a water source, which draw water from aquifers, underground water-bearing rock. Given the variety of rock and soil types in our area, it follows that there would be variations in the natural chemistry of the water.

High levels of naturally occurring elements in your water can create unpleasant side effects such as staining of plumbing fixtures, bad taste, odor and corrosion to piping. More importantly, these same elements can greatly decrease the efficiency of fixtures and appliances such as dishwashers, water heaters and boilers, and could result in damage to your plumbing system.

Fortunately, treatment systems are available that, after installation into your home's water piping system, will protect you from these unwanted conditions. After a careful assessment of your property's water quality, Patriot Plumbing will offer the right water conditioning system solution for you, your family and your property.

Hard water, water softeners, de-scalers

Hard water contains high levels of dissolved minerals, mainly calcium and magnesium, which can pose serious problems to your plumbing and other fixtures or equipment that handle water. This type of water can greatly reduce the efficiency and life span of appliances, water heaters and boilers; create staining on dishes, faucets, tubs, sinks and shower doors; and is often indicated by lack of suds formation when soaps and cleaning products are agitated in water. To combat the effects of hard water, the most common solution is installation of a water softener.

Water softeners: Conditioned water from a conventional type of water softener will remove high calcium and magnesium levels in your water. It does this through a process known as "ion exchange." Simply put, a water softener trades hardness (minerals) for something else, in most cases sodium.

Two of the components of a water softener are a mineral tank and a brine tank. The mineral tank contains resin beads that carry a negative charge. Calcium and magnesium in water both have positive charges. As water passes through the mineral tank, the negatively charged resin attracts and holds the unwanted positively charged calcium and magnesium minerals. Once the resin becomes saturated with these minerals, a strong saltwater solution, or "brine," is flushed through it, removing the calcium and magnesium minerals. The brine tank contains softener salt that creates this solution. Once this flush is completed, the resin is rinsed with fresh water to remove excess brine.

Hard water treated with a water softener has many benefits:

- It will preserve the life of all water-handling appliances such as dishwashers, ice makers and clothes washers, as well as reduce the yearly energy cost of water heater operation.
- With a water softener your silverware and glassware will be cleaner and shinier and shower doors will no longer look hazy and streaky.
- Your hair and skin will feel softer, cleaner and smoother.
- Fabrics are also softer and whiter and last longer.
- Less soap and shampoo is needed and they produce a much richer lather.

While soft water produces many desirable conditions, the most important is the protection it delivers to your plumbing system. Water treated with a water softener will increase the lifespan of all piping and fixtures and greatly reduce the many negative impacts of hard water.

Maintenance: A water softener will need to be replenished with salt. You can be placed on our call list for regular delivery and replenishing.

De-scalers: De-scalers or “salt-free water softeners” are actually anti-scale systems. They do not remove hardness minerals from water; rather, they transform them into crystals that remain in suspension, which prevents the minerals from adhering to fixtures, appliances or piping. The size of the crystals allows them to be flushed away easily by the normal flow of water. Unlike a conventional water softener, a de-scaler will not produce richer soap lathers or a cleaner, smoother sensation on your skin and hair, but they do protect your plumbing system.

The main benefit of de-scalers is their ability to soften without introducing sodium into the water, thus making them more heart-healthy and environmentally friendly. Conventional water softeners that use salt may affect people with high blood pressure or heart disease. They also use water to flush themselves of brine, and that saltwater is then discharged into the environment. Another difference is de-scalers require less maintenance. The mix or “media” inside the tank does not dissolve, and can last up to 5 years. Water softeners, on the other hand, consume salt and require occasional replenishment throughout the year.

Salt-based systems are a common, highly effective way to treat hard water. However, they do come with potential health concerns to some and require ongoing salt replenishment. De-scalers offer a salt-free, more eco-friendly alternative.

Maintenance: De-scalers require maintenance every 5 years.

pH and neutralizers

Another very common and more serious water quality issue in our area is low pH, or “acidic water.” The pH value of water is measured on a scale of 1 to 14, with 7 being “neutral.” Values lower than 7 are acidic, while values higher than 7 are considered alkaline. Pure water has a pH value very close to 7. Water with a pH of 6.5 or less is detrimental to your plumbing system and your health.

Acidic water causes corrosion to piping, which results in “pinhole” leaks and greatly diminishes the life of dishwashers, water heaters, boilers and all other water-using appliances. The corrosiveness of acidic water also causes leaching of heavy metals such as iron, copper and lead from its surrounding environment into your drinking water. Acidic water causes green/blue staining on bath fixtures and can stain your clothes in the laundry. You may also notice a metallic or sour taste in your water.

Overall acidic water wreaks havoc on your plumbing system. A pH neutralizer raises the pH level of your water and combats the problems associated with acidic water. It will extend the life of your plumbing and appliances while protecting your health and your family’s.

Maintenance: The media in your neutralizer needs to be evacuated and replenished annually or in some cases semiannually. You can be placed on our maintenance call list to ensure your maintenance is performed on a timely basis.

Sediment and whole-house sediment filters

Well and public water systems often contain sand, rust, silt and other forms of sediment that will deposit itself in your plumbing system, aerators and shower heads. It will clog screens and diminish flow. It will also find its way into your plumbing fixtures, resulting in running toilets and dripping faucets.

More seriously, sediment will collect in the bottom of water heaters, where it can cause multiple problems. In gas water heaters, it forms an isolative layer between the gas burner and the water. The sediment slows heat transfer and overheats the bottom of the tank. Overheating weakens the steel and damages the glass lining, shortening the life of the heater. In electric water heaters, sediment can bury the lower element, causing it to burn out.

Well tanks, if not flushed out routinely, will leak and ultimately fail prematurely.

By straining out solid particles, a whole-house sediment filter will greatly reduce the amount of sediment allowed to enter your plumbing system. This type of point-of-entry filter is installed directly into your property’s main water line and is an essential tool in water treatment.

Maintenance: The cartridge in your sediment filter needs to be changed annually or semiannually. If this is not done, you may experience decreased water pressure caused by sediment that has collected in the filter, obstructing water flow. You can be placed on our call list to have this service performed on a timely basis.

Drinking water filtration and reverse osmosis (RO) systems

Reverse osmosis is a process in which approximately 99 percent of dissolved inorganic solids are removed from your water. This is accomplished by your property’s water pressure pushing your water through a semi-permeable membrane. The membrane allows only the water to pass through; impurities and contaminants are flushed down the drain. The result is pure, clean drinking water.

Reverse osmosis filters can remove myriad organic and inorganic contaminants from your tap water. These systems specialize in removing chlorine taste and odor, and also alleviate common

worries about public water by reducing or completely removing arsenic, fluoride, lead and VOCs to name a few. RO systems purify water daily, which is more naturally fresh and healthier than the stagnant water that has been sitting in plastic bottles. RO systems also ensure the purity of the water, something bottled water cannot do.

These eco-friendly systems also protect the environment from plastic waste, as RO users will never have to purchase and dispose of plastic water bottles again. Options for dispensing RO filtered water are a sink spout dispenser and/or from your refrigerator ice and water dispenser.

Maintenance: Filters need to be changed annually. You can be placed on our call list to have this service performed.

Bacteria and ultraviolet light treatment

How it works: Ultraviolet purification uses a UV light source (lamp) that is enclosed in a protective transparent sleeve (usually quartz). The lamp is mounted so water passing through a flow chamber is exposed to the UV-C light rays. When harmful microbes are exposed to the UV rays, their nucleic acid absorbs the UV energy, which then scrambles the DNA structure of the organism. The cell is rendered sterile and can no longer reproduce. The cell is now considered dead and is no longer a threat.

Applications: UV treatment is an excellent choice to eliminate biological contamination from most home drinking water, whether your home is on a municipal water system or untreated private system (well, lake water, etc.). Its sole purpose is to kill harmful biological contaminants, and therefore should always be combined with other forms of filtration (GAC / carbon block, KDF, or reverse osmosis) for reduction of heavy metals, chlorine, VOC's, and other chemical contaminants.

What it kills: There are no micro-organisms known to be resistant to UV, unlike chlorination. UV is known to be highly effective against bacteria, viruses, algae, molds and yeasts, and disease-causing oocysts.

If you get your drinking water from a private well, you are responsible for its maintenance and testing for quality. It is highly recommended that bacteria tests be performed. Pathogens can be deposited in water by animals and humans through various activities and weather conditions.

The results of a "bad" water test would indicate the presence of coliform bacteria, which should not be present in your drinking water. Their presence indicates that disease-causing organisms (pathogens) could be in the water system. Ingestion of these organisms can result in gastrointestinal illness with flu-like symptoms and can lead to such serious diseases as hepatitis, dysentery and cholera.

Note: Requires pre-filtration to maintain effectiveness — sediment and other contaminants can create a "shadow" that prevents UV rays from reaching the harmful microorganisms.

Advantages: UV water purification offers these advantages:

- It is one of the few affordable technologies for the home that effectively kills the majority of bacteria, viruses and other harmful microorganisms.

- It is energy-efficient — it requires about the same amount of energy as a 60-watt light bulb.

Maintenance: UV lamps (bulbs) require annual replacement to ensure optimal performance. UV lamp performance, just like any other light source, will slowly diminish over time. Beyond one year, there is no assurance that the UV light emitted from the bulb will provide sufficient disinfection. Remember, UV light cannot be seen. The bulb may still produce light, but not necessarily UV rays. The quartz sleeve does not need replacement unless it gets broken; however, it should be cleaned several times per year (outside only).

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