

Your Water, Your Business

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Not taking your water seriously could cost you

Water is just water, right? Just turn on the tap, and there it is. What's the big deal? Unfortunately, a light attitude toward your water could be costing you money and customers. Consider all the ways you use water. Is water an ally to your bottom line, or is it another problem you deal with on a daily basis? With today's water processing technologies, you should have few problems. A myriad of readily available water filtration and water processing and formulation equipment can give you the water your business needs.

No Small Feat

When was the last time you had to run down to the stream or well to grab a bucket of water to use in your home or business? It's pretty amazing that we have all the water we need right at our fingertips wherever we need it.

It's no small feat that your local municipal water supplier provides a constant supply of clean, drinkable water at a constant pressure and volume to wherever you demand it as long as you keep paying that bill. Because our local municipal water authorities provide this extraordinary service to us day after day, most consumers take the quality of available water for granted.

The water delivered to our businesses and homes meet specific safety standards for consumption. However, only 0.5 percent or so of tap water is consumed; the great majority is used for commercial, industrial, manufacturing, landscaping and other purposes. So addressing the flavor quality of drinking water is simply not a high priority for your water purveyor. Instead, we consumers are expected to treat the water we use.

The most common water constituents that are known to make trouble include sediments (particulates in the water stream), total dissolved solids, water hardness and chlorines. Before we can formulate a successful strategy to remove or reduce the problems in our water, we first will need to perform a few simple water tests. Testing for these items is relatively simple, and water testing kits are available on many water treatment supplier websites. Any qualified water treatment tech would be able to quickly test for these parameters in your water.

Sediment

In many cases, holding a clear glass full of water up to the light may be enough of a test to know to what degree you have a sediment problem. Sediment filtration is also referred to as pre-filtration, as we want to first remove these larger particles of dirt, rust, sand, grit and other suspended solids before treating other issues. Neglecting this first stage of filtration would foul subsequent filter mediums.

Sediment is removed by mechanical filtration, since the goal is to remove larger particulates that can be seen by the naked eye. In a retail establishment, this is done using a cartridge-style meltblown or spun polypropylene filter, which is available in various sizes. Often you will see this filter in a clear polycarbonate filter sump. As sediment filters are not rated by gallons of water usage, visual appearance and pressure loss will tell you when this filter needs to be replaced.

Total Dissolved Solids

In short, total dissolved solids are any minerals, metals or salts dissolved in water. These dissolved solids can come from many different sources: organic sources such as leaves, silt fertilizers or runoff from urban areas; industrial waste; or inorganic materials such as calcium, nitrogen, salts and sulfur which the water encounters while traveling through underground aquifers, lakes, rivers and streams.

Although we express total dissolved solids (TDS) quantities in water in parts per million (ppm), which sounds like a profoundly small quantity, they have a big effect on water-fed equipment. In most cases, we do not want to remove TDS entirely but reduce it. The most economical and reliable method available to us now is reverse osmosis (RO), a water purification process where water is forced through a membrane. RO can treat water for a wide variety of health and aesthetic contaminants that cause unpleasant taste, color and odor problems. The RO process sends purified water to the points of use and discharges contaminants to a drain. When combined with pre-filtration, RO can remove 90 to 99 percent of dissolved impurities that reside in municipal waters.

Water Hardness

Almost all water will contain amounts of dissolved minerals. What we describe as "hardness" is minerals, calcium and magnesium that are less soluble in water and tend to precipitate when water changes by pressure or temperature. These changes allow hard minerals to form tenacious deposits referred to as "scale." In water-heating equipment, scale builds up in layers on heat transfer surfaces, insulating water from efficient heat transfer and resulting in higher energy costs.

If your water is hard, you will see scale formations on your faucet aerators and on the chrome finish on your faucets. RO will effectively remove water hardness minerals, but too much water hardness will quickly foul RO membranes, greatly reducing their efficiency. Many RO system manufacturers suggest installing a water softener before the RO system to protect the membrane and extend its lifespan. Sequestering agents such as polyphosphates, siliphos and hexametaphosphates are commonly employed to control mineral scale deposits. This type of water treatment has been widely used for many years and is effective in cold water applications such as ice machines.

Chlorines

Here, activated carbon in the form of carbon-block cartridges are our go-to guys. Activated carbon is a well-established technology for the reduction of a wide range of contaminants, including residual disinfectants (chlorines, fluorides and chloramines). Activated carbon removes these constituents by a process called adsorption, meaning a cartridge can collect many organic molecules on its surface.

Carbon filter cartridges are usually rated in gallons. That rating would refer to how many gallons of water could flow through the filter before its effectiveness will be depleted. Most activated carbons are made from raw materials such as nutshells, coal and wood.

Problem Areas

What are the areas of water use we should be concerned about? Do you sell coffee or tea? Do you use any ice machines, beverage dispensing equipment or steamers/combi-ovens? Any water-fed equipment is quite dependent on water quality.

Coffee and tea. Ninety-eight percent of a cup of American brewed coffee is water, so it is hardly surprising that the quality of water used is critical to the flavor of the coffee. For the best-tasting coffee and tea, you must first know what is in your water. Untreated water from the tap will contain varying amounts of TDS. TDS can be comprised of various components such as minerals, hardness (calcium and magnesium) and salts. Brewing coffee with high TDS water will result in a weak-tasting brew due to under extraction of the flavors from the ground coffee. Too low of TDS will result in over extraction of the grinds, resulting in a very bitter taste. This is especially true of water that has been softened by a water softener before being sent to a coffee brewer, as ion-exchange water softeners remove water hardness. Without the proper amount of water hardness, which is essential for extracting the flavors from the coffee bean, you will be left with a bitter cup of coffee.

Here we should mention that the process for espresso extraction is quite different. Espresso extraction does not depend so much on mineral content. Very hot water is forced under high pressure through a finely ground coffee "puck," through which water will not pass easily. As the water is not in contact with the coffee for very long, the minerals in the water do not have much of an effect in the role of extraction.

Tea is especially sensitive to water quality. Make your teas with water that is low in mineral/hardness content, high in oxygen and as free from additives and contamination as possible.

Water purveyors will also use chlorine or chloramines as a method of disinfecting the water supply. The aromas and flavors from these additives will certainly ruin any beverage and must be greatly reduced, if not removed altogether. Chlorine is also a major contributor of corrosion in water-fed food service equipment. Carbon filtration and RO systems are commonly used to remove chlorines from water. RO and ultrafiltration systems have been used to reduce TDS in water for several decades.

Ice machines. The three main water quality issues plaguing ice making equipment are scale accumulation due to high water hardness, chlorine and sediment. Some of the more common issues include water hardness scale deposits, high TDS suspended matter plugging distribution tubes and float valves, ice bin corrosion, evaporator tubes and ice auger pitting. You can increase your equipment's energy efficiency and lifespan by using water filtration designed for ice machines. By removing the problem constituents in your water with ice machine specific water filtration, you will avoid up to two-thirds of your ice machine service calls.

Steamers and combi-ovens. Once again, poor water quality can be identified as a major contributor of problems associated with this equipment as it promotes the formation of hardness scale deposits on steamer/oven surfaces and liquid level sensing probes. As with ice machines, reducing or removing chlorines in your water will greatly reduce problems with corrosion and will result in longer equipment life.

The Bottom Line

The road to better tasting beverage products and fewer breakdowns and emergency service calls goes right through the water you send to your water-fed equipment. Contact a water treatment dealer experienced with water filtration and formulation systems to find out which water systems they might suggest to achieve your water quality goal. Ask about intervals of system maintenance, availability of replacement filter cartridges or repair parts. Do not assume that more expensive filters or systems are better. Make sure your water treatment dealer knows about your industry and how the equipment will work for you. To the extent that the quality of your water can be improved, the taste and ultimately the quality of your product and business will be improved as well.

Ted Riggs is the Owner and Tech Service Director of Riggs Water Service, a Colorado service company for many coffee and tea operations in the Colorado Front Range. He has 12 years of experience in service, repair and all things water filtration and formulation, with an emphasis on the coffee and tea markets. He has 25 years of plumbing and facilities maintenance service experience.