

LEAD IN DRINKING WATER: FILTRATION AS A FIX

There is a growing concern in America today about how much lead is in the water we consume. For decades, many have assumed that lead in water was a thing of the past. After all, most cities have municipal water systems that test, monitor and remove such things, right?

Then along came the very public disaster in Flint, Michigan, bringing with it a heightened awareness of the harm that lead can cause. Suddenly articles began cropping up in well-known publications such as USA Today, questioning whether the issue of lead in drinking water is isolated to that one community, or if the problem is perhaps more widespread (Ungar, 2016).

With the heightened concern about lead in our drinking water, Elkay[®] has received questions about the possibility of using point-of-use filtration to remove lead that has leached into drinking water from the plumbing supply system before it comes out of a drinking fountain and/or bottle filling station outlet.

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In fact, many of Elkay's water delivery products (bottle filling stations, drinking fountains and water coolers) already feature filters that are tested and certified by the Water Quality Association (WQA) to NSF/ANSI Standard 53, confirming that they effectively reduce lead from incoming water levels with 150 parts per billion of lead to below Environmental Protection Agency action levels (15 ppb) for up to 3,000 gallons.

“NSF/ANSI Standard 53 for Drinking Water Treatment Units is the nationally recognized standard for evaluating and certifying drinking water treatment systems for the reduction of contaminants from drinking water. Water filters are tested and certified to NSF/ANSI 53 to ensure they reduce contaminants, including lead, per the requirements of the standard” (Certified Product Listing, NSF).

Ordinarily, the water tested to achieve NSF/ANSI 53 certification contains 150 ppb of lead. To be certified, a filter must reduce that level to less than 10 ppb, which is 5 ppb lower than the action level mandated by the U.S. EPA. In response to many requests from facility managers concerned about elevated lead levels in their water, Elkay tested their filters using the same testing methodology used for certification, but using water with a lead concentration of 1,500 ppb, which is 10 times the lead level used in NSF/ANSI 53 testing and 100 times higher than the U.S. EPA Action Level.

What this means to you: You can feel confident that if your water contains lead up to 150 ppb, bottle filling stations, drinking fountains or water coolers equipped with an NSF/ANSI 53 certified filter from Elkay can reduce the lead to levels significantly below the U.S. EPA Action Level for up to 3,000 gallons. For some applications, such as bottle filling stations, drinking fountains and water coolers, upgrading to a filtered model may be a viable solution for schools and other institutions who want to remove lead from their drinking water.

WHERE IS THE LEAD COMING FROM?

One critically important thing consumers learned through the situation in Flint, Michigan, is that the lead that we are working to keep out of our drinking water is not present when the water leaves the municipal water system (“3Ts for Reducing Lead in Drinking Water in Schools Revised Technical Guidance.” EPA, 2006). With few exceptions, the lead is transferred to the water somewhere between the distribution plant and the device where the water is drawn — originating from either the pipes and fittings that are used throughout the distribution system (which may be the responsibility of either the public water system or the building owner), or from the pipes and fittings within the building itself (which are the responsibility of the building owner).

Please Note: Regular maintenance is required when using filters as a lead remediation method. Should water flow decrease, the filter may need to be replaced sooner, as this may indicate that your building may have experienced a spike in particulate lead that has compromised the filter’s ability to filter lead and other particulates. Always maintain your filters per the manufacturer’s specifications provided with your unit, and replace your filters should output flow level be dramatically reduced, regardless of whether you are approaching the 3,000-gallon filtration capacity.

WHAT IS SO BAD ABOUT LEAD?

Lead has been widely used to transport water for many centuries. Such use was so common that the word “plumbing” derives from plumbum, the Latin word for lead (Plumbing, Wikipedia).

In the United States, lead was a common plumbing material up until 1986. Although there have been regulations and changes in plumbing codes making it illegal to use lead pipes or solder, you will still find lead in older pipelines, solder and in brass fittings in today’s plumbing systems. Lead is also found in metal alloys like brass and bronze, which are commonly used in water faucets and other plumbing fittings.

Despite its usefulness, lead has been proven to create very serious health problems for people (particularly children and pregnant women) who ingest it. Lead is toxic — even at low levels, continuous exposure causes a variety of health problems, including permanent nervous system, brain, and kidney damage, hyperactivity and other behavior and learning issues, memory problems, severe headaches, high blood pressure, hearing problems, impaired growth, reproductive problems, digestive problems, and muscle and joint pain. In some instances, exposure to extreme lead levels has even resulted in death.

Lead is more easily absorbed by sensitive tissue such as that found in growing bodies, and the effects are cumulative, irreversible, can exacerbate other health problems and can last a lifetime. For these reasons, vulnerable populations such as babies, infants, young children, seniors, people with existing health issues and pregnant and/or nursing mothers should avoid ingesting lead at all costs (“3Ts for Reducing Lead in Drinking Water in Schools Revised Technical Guidance.” EPA, 2006).

HOW MUCH LEAD IS TOO MUCH LEAD?

Because lead accumulates in the body, ingesting any lead is considered bad. The target consumption level should always be zero (“Basic Information about Lead in Drinking Water.” EPA, 2016).

That being said, the U.S. EPA has established a lead “action level” for public water systems of 15 ppb. If more than 10% of water sampled, system-wide, hits this level, then corrosion control treatment may be necessary. The level is different for schools. If a school finds that their lead level exceeds 20 ppb coming from a particular outlet at first draw, the outlet should be taken out of service (“3Ts for Reducing Lead in Drinking Water in Schools Revised Technical Guidance.” EPA, 2006).

Lead in Drinking Water | Filtration As a Fix (continued)

Before the 1970s, there was not as much known about the risks of lead in the plumbing supply, and there were no regulations and standards around its use. The first regulations pertaining to lead in the water supply came about as part of the Safe Drinking Water Act (SDWA) in 1974. This act was primarily aimed at the public water systems, providing guidance for how to protect the public from known or potential contaminants in the public water supply including lead. In 1986, amendments to the SDWA provided additional guidance from the EPA aimed at minimizing the corrosivity and amount of lead in water supplied by public water systems (the Lead and Copper Rule), and requiring that low-lead materials be used in all new plumbing and plumbing repairs (the Lead Ban). Later, in 1988, Congress passed the Lead Contamination Control Act (LCCA), which focused on the identification and reduction of lead in drinking water at schools and day care facilities. By 1997, the national plumbing codes had started requiring that plumbing products in contact with drinking water comply with NSF 61, the industry standard used to verify that plumbing products do not contaminate drinking water with lead along with a multitude of other chemicals known to cause adverse health effects.

This gradual awareness and subsequent regulation of lead in plumbing resulted in a number of manufacturers of everything from plumbing components and pipes to water coolers, to modify the materials from which they constructed their products (“Lead in Drinking Water in Schools.” EPA, 1994). This movement to safer materials was further driven by legislation in 2001 and then again by the Reduction of Lead in Drinking Water Act in 2014 lowering the maximum lead content to its current limit of 0.25%, assessed as a weighted average with respect to the wetted surfaces of pipes, pipe fittings, plumbing fittings and fixtures.

It has been illegal in most localities to install lead pipes, lead solder and flux since the 1974 Safe Drinking Water Act was signed into law, but the brass and copper sometimes used in plumbing products can contain some lead content as well. And although the codes prohibit the use of lead in new and replacement plumbing products, a significant number of older buildings still contain lead plumbing products that were installed before the rule change.

Causes of lead within your building’s water system may include recent plumbing work and/or repairs where lead solder or materials containing lead were used, areas where the plumbing has been used to ground electrical circuits, corrosive water with low pH and alkalinity, older water coolers containing lead-lined storage tanks or components, areas of low flow and/or infrequent use, and pipes that are clearly deteriorating where high flow may cause particulate within the pipe to break free (3Ts, EPA).

Seems easy to remedy, then, doesn’t it? Just replace all the lead pipes and plumbing fittings where the lead originates. But the causes of lead



HOW IT WORKS

High-grade filter is made with activated carbon and patented ATS lead-removal media.

Spun polypropylene prefilter mesh to prevent large, coarse sediment and particles from entering and clogging media.

Radial flow-through design provides more surface area for untreated water.

contamination in water are many and varied, and it's not always that easy to identify precisely where the lead is coming from. Even when the source is identified, replacing thousands of miles of pipe in our national water infrastructure is an extremely expensive undertaking. Take service lines, for example. According to the EPA, there are an estimated 10 million lead service lines in the United States. At a conservative estimated cost of \$5,000 to replace each service line, it will require approximately \$50 billion to tackle lead service lines alone (McWhirter, 2016).

Then there are the costs of remediating lead plumbing within a building itself. While it can be costly to remediate lead by testing and then removing all of the suspect service lines, interior pipes, fittings and solder joints in a single family home, lead mediation costs are exponentially higher and more complex for large public buildings such as multifamily dwellings, hospitals, park district buildings and schools that rely on taxpayer dollars to tackle large capital projects of this kind.

There are approximately 90,000 public schools and 500,000 child care facilities in the United States that are not regulated by the Safe Drinking Water Act (SDWA), because they draw their water from a public water system, and therefore are not required to test their water (Ungar, 2016). Many people are beginning to question whether these schools should be required to test their water to determine whether they have lead in their water systems due to old pipes, fittings and service lines. In response, many schools have voluntarily started to test their water ("Lead Testing." CPS : Home), while some states are considering changing their laws to require schools to test their water (Griffeth, Carleigh. "NC Bill Would Require Testing").

Lead is a serious problem that cannot go unchecked, so managers of facilities built before 1986 ("3Ts for Reducing Lead in Drinking Water in Schools Revised Technical Guidance." EPA, 2006) should develop an action plan for testing and remediating any lead issues they may find to protect their patrons. The good news is that the EPA has devised a comprehensive process for identifying lead in our drinking water supply and a number of safe, effective remediation solutions are available to parents, and school, park district and hospital officials who find themselves in the position of needing to deal with lead in the drinking water.

DRINKING FOUNTAINS — A CRITICAL POINT OF USE

Drinking fountains and water coolers, because they are specifically designed with water consumption in mind, are critical to any lead testing and remediation plan. One of the first steps will be to test to determine the amount and type of lead (soluble vs. particulate), if any, that is in the building's water supply. If lead is found to be present during initial testing, a second round of testing will be needed to isolate the "source" of the lead.

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According to the EPA (Basic Information about Lead, EPA), "Many water filters and water treatment devices are certified by independent organizations for effective lead reduction. Devices that are not designed to remove lead will not work. Verify the claims of manufacturers by checking with independent certifying organizations that provide lists of treatment devices they have certified:

- Water Quality Association (WQA).
- NSF International.

There may be other third-party certifiers that also certify filters to NSF/ANSI 53 as well.

WONDERING HOW TO GAUGE QUALITY IN A WATER FILTER?

"Government agencies, such as the EPA, don't test water filters for effectiveness in removing lead from water." (Network, 2016)

To confirm whether a particular brand of filter has been officially certified by an accredited certification body, be sure to check both the [Water Quality Association](#) and [NSF International](#) website listings. If you do not find the filter you are considering on one of these sites, it may not perform to the level you need for lead contamination.

"The American National Standards Institute, a nonprofit organization that oversees development of voluntary consensus standards, has accredited both organizations." (Network, 2016)

You can find information about Elkay's NSF/ANSI 53 Certified Products on the WQA page below: wqa.org/find-products/ctl/detail/mid/1054/cid/elkay_manufacturing/sid/3/keyword/elkayLead

Lead in Drinking Water | Filtration As a Fix (continued)

Elkay's drinking fountain and cooler brands have been lead-free in accordance with all state and federal laws since 1991. When water from an Elkay or Halsey Taylor® cooler or fountain manufactured since that time is tested, any lead found in the outflow is being passed through from the building water supply line leading into the fountain. Despite the availability of drinking fountains, water coolers and water bottle filling stations with specially-designed filters that are certified to meet or exceed NSF/ANSI Standard 53 to remove lead from the water source itself, only a small percentage of schools and institutions actually have these types of units installed. For older institutions built before 1986 that may have elevated lead levels in their water up to 150 ppb, upgrading to a filtered model or retrofitting NSF/ANSI 53 certified filtration onto an older model may be a viable solution to reduce lead in drinking water.

RESOURCES AND READINGS

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