PEOPLE'S ACTION INSTITUTE
Center for Health, Environment & Justice
Mentoring a Movement, Empowering People, Preventing Harm
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Filters for Removing Lead from Drinking Water

Lead enters the water supply through the corrosion of pipes, fixtures, and solders that contain lead. As many as 10 million of homes, built before Congress banned the installation of new lead plumbing materials in 1986, have plumbing composed entirely of lead according to a 2016 EPA report.[1] Millions of additional homes contain lead solder. Even "lead free" materials were allowed to contain up to 8% lead until 2014 when it was reduced to 0.25%.[2] Thus even recently installed "lead free" plumbing can contain some levels of lead, making this a problem regardless of the age of a house. As long as lead exists in plumbing fixtures, it can leach into drinking water. No quantity of lead ingested is safe for the human body, and while decreasing the amount of lead in plumbing is great progress, it still leaves households vulnerable to exposure to the toxic contaminant. Ingesting even small quantities of lead through drinking water can cause kidney issues, brain damage, less oxygenated blood, and other serious health problems.[3] Developing infants, young children, and pregnant women are at a much higher risk of lead poisoning than adults and can be damaged by lower concentrations of lead that wouldn't have as much an effect on a fully-grown adult.[4]

If you are concerned about lead in your drinking water, you should read our fact sheet on Testing for Lead in Drinking Water. Limitations in testing procedures defined by the Environmental Protection Agency's (EPA) Lead and Copper Rule and the failure of certain tests to account for the fluctuations in lead under different conditions leaves many households vulnerable to drinking lead-contaminated water that they've been told is completely safe.

The Bad News: Essentially everyone in the U.S., regardless of the age of the house they live in or its location, is at risk of ingesting dangerous concentrations of lead in their drinking water.

The Good News: Relatively simple, affordable, and long-lasting water treatment devices can be easily installed to ensure better protection against this looming danger. Precautionary steps are especially important for families with children under the age of six and for pregnant women to protect against serious organ and brain damage due to ingesting high levels of lead in drinking water.

A vast array of certified products are available that remove over 99% of lead in water and achieve lead levels below 15 parts per billion (ppb), the EPA drinking water standard. The Water Quality Association (WQA) and NSF International are independent organizations accredited by the American National Standards Institute (ANSI) to certify products for lead reduction in drinking water. When purchasing a water treatment system intended to remove lead from drinking water, look for these seals to ensure they've been tested by third party professionals and proven to work.

NSF/ANSI Standard 42
Drinking Water Treatment Units - Aesthetic Effects

NSF/ANSI Standard 53
Drinking Water Treatment Units - Health Effects

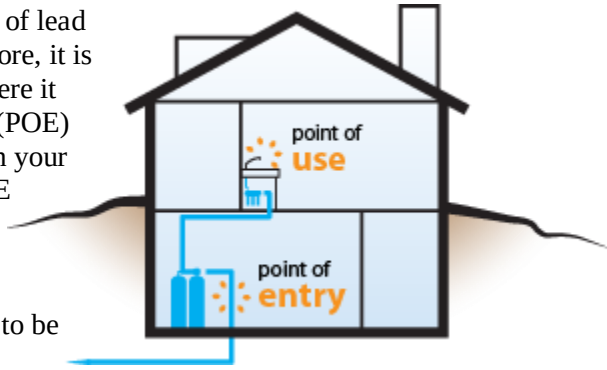
TESTED AND CERTIFIED Water Quality UNDER INDUSTRY STANDARDS ® C USA

[1] https://www.epa.gov/sites/production/files/2016-10/documents/508_lcr_revisions-white_paper_final_10/26.16.pdf
[2] https://www.wqa.org/programs-services/product-certification/product-certification-areas#LowLeadCompliance
[3] https://www.cdc.gov/niosh/topics/lead/health.html
[4] https://www.aap.org/en-us/about-the-aap/aap-press-room/pages/With-No-Amount-of-Lead-Exposure-Safe-for-Children,-American-Academy-of-Pediatrics-Calls-For-Stricter-Regulations.aspx

The best filters for lead should meet the Class I particulate reduction standard (*NSF/ANSI 42)* and the lead reduction standard *(NSF/ANSI 53)*. To ensure these filters keep working, they must be maintained and replaced according to each manufacturers' individual specifications.

While deciding which lead filtration system to use, several short-term actions you might consider include using bottled water and "flushing" the water at the tap before using it. The Centers for Disease Control (CDC) recommends running showers and other high-volume taps on the coldest setting for 5 minutes, then running the kitchen tap on cold for another 2 minutes before using for drinking and cooking.[5] This should be done whenever the water has been sitting for a while in the pipes, such as when you first wake up in the morning or when coming home from work. Some researchers recommend flushing water as often as once every 2-3 hours.[6] The most effective long-term solution is to install a certified lead filter.

The most recent standard for 'lead-free' plumbing still allows some amount of lead (0.25%) and will not guarantee complete safety from contamination. Therefore, it is important to use filtration systems at the Point-Of-Use (POU) for water, where it comes out of the faucet, rather than systems installed at the Point-Of-Entry (POE) where water enters your house (see figure). If there is any lead piping within your household, it would contaminate water even AFTER it was treated by a POE system, and the lead would still reach consumers. Boiling water does not remove lead, so filtration is the only option.



The least expensive POU water treatment systems that remove enough lead to be NSF and/or WQA certified are faucet-mounted filters or filtered jugs and pitchers. Some options to consider are listed below.[7]

Name/Model	Initial Price	Replacement Filter	Recommended Time to Replace Filters
Brita SAFF-100	$19	$19	Every 4 months or 100 gallons
PUR Basic *or* AdvancedPlus	$25-$40	$13-$19	Every 3 months or 100 gallons
Culligan FM-25 *or* FM-15A	$20-$25	$14	Every 2 months or 200 gallons
ZeroWater 30-Cup Dispenser	$40	$10	Every 3-6 months

Several of these filters were distributed to residents of Flint after the crisis there, while others are recommended by non-profits such as Consumer Reports. They have been proven to effectively remove lead from water to below the 15 ppb threshold. Filters remove lead by forcing the contaminated water through specially designed materials where lead is either trapped in tiny pores or stuck to the surface, essentially corralling it away and allowing the treated water to flow through. However, much like a vacuum cleaner that cannot suck up anymore dirt once full, these filters eventually become saturated, or overloaded to the point where all the pores are filled and can no longer separate the lead from the water. If not replaced at this point, lead will flow through the filter as if it wasn't there. When to replace the filter depends on how much water is used, and the concentration of the lead in the water. Higher concentrations of lead require more frequent replacements. Manufacturers suggest different time frames for when filters should be replaced, and it is vital to follow their recommendations. Filters are also much more effective at treating cold water, as increased temperature can corrode lead faster, resulting in higher concentrations of lead.

It is important to note that most filters are only certified to remove a maximum of 150 ppb of lead (10 times greater than the EPA action level). However, some professionals suggest that filters are still effective above this level, as such high concentrations usually result from lead particles that flake off the pipes which can still be trapped by the filters. Lastly, keep in mind that a filter designed to remove lead may not remove other contaminants that may be present in your water.

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[5] https://www.cdc.gov/nceh/lead/tips/water.htm
[6] https://ehp.niehs.nih.gov/wp-content/uploads/101/3/ehp.93101240.pdf
[7] https://www.michigan.gov/flintwater/0,6092,7-345-75251_75315---,00.html