

Lead & Water

Corrosion Control at CLCJAWA

The drinking water that CLCJAWA delivers to each community contains no detectible lead. Lead can enter drinking water through corrosion of plumbing materials in your home. Homes built before 1986 are more likely to have lead containing pipes, fixtures and solder. A common lead source is brass or chrome-plated brass faucets or fixtures with lead solder, from which significant amounts of lead can enter into the water, especially hot water. CLCJAWA adds a drinking water certified corrosion inhibitor called orthophosphate, to the water. This common drinking water and food ingredient binds with metals like lead, to keep them from corroding and getting into your water from your plumbing. This compound reduces lead in many homes but does not remove it completely from all homes or to levels considered safe in some homes. The ultimate way to reduce lead in your water is to remove lead containing plumbing materials in and on your premises.

The primary source of lead in drinking water is lead in household plumbing materials.

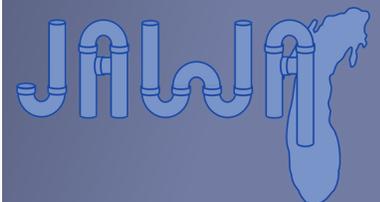
Corrosion Control within your Community

The Lead and Copper Rule was created to reduce the likelihood of lead and copper being introduced into the drinking water from the corrosion of lead and copper plumbing materials. Because your community is responsible for lead compliance, contact them for more information, or go to the state website at <http://water.epa.state.il.us/dww/> to review water results for your community. The primary source of lead in drinking water is lead in household plumbing materials. Should a village exceed lead regulations, the village is also tasked with educating homeowners about specific measures that can be used to reduce lead levels in home drinking water. Every community water supply must collect water samples and test for lead and copper. Samples are collected from homes and businesses approved by the Illinois EPA following specific Lead and Copper Rule criteria. The total number of samples required during each monitoring period is dependent on the population served and past monitoring results. Initial monitoring periods are every six months but can be reduced to every three years if levels are below 0.015 milligrams per liter (mg/l) for lead and 1.3 mg/l for copper in 90% of the samples. If more than 10% of the total samples collected exceed these levels during any monitoring period, an "action level" (AL) exceedance is triggered and a number of additional actions to control corrosion must take place. Exceeding an AL is not a drinking water violation; however, failure to initiate the additional requirements may trigger a viola-



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Lead in the Environment

Inorganic lead is a malleable, blue-gray, heavy metal that occurs naturally in the Earth's crust. Lead can be found in all parts of our environment – air, soil, and water. It can be toxic to humans and animals, causing adverse health effects. Lead was one of the first metals used by humans and consequently, the cause of the first recorded occupational disease, lead colic, which was first diagnosed in a 4th century BC metal worker. Human activities, such as past use of leaded gasoline, lead paint, use of fossil fuels and certain industrial activities result in much of our lead exposure. Lead can be used as a pure metal, combined with other metals to form an alloy (i.e. brass which often contained lead), or as a chemical compound.

In 2012, U.S. production of lead was estimated at 1.6 million metric tons; primarily from refining of scrap metal. The primary use of lead in the U.S. is for automobile lead-acid batteries. Lead has a wide reach though and has been used in a wide variety of products

found in and around homes, including paint, ceramics, pipes and plumbing materials, solders, gasoline, batteries, ammunition, toys and cosmetics. Prior to the mid 1980s, organic lead compounds were used as an antiknock additive and octane booster in gasoline. Environmental exposure concerns resulted in the gradual phase-out of leaded gasoline in the United States. Organic lead compounds continue to be used in high octane fuel in the aviation industry for piston engine aircraft. Lead was used extensively as a corrosion inhibitor and pigment in paints but concerns over its toxicity in 1977 led to banning the use of lead in paint for residential and public buildings. Lead concentration in toys is mainly associated with use of lead in paints, coloring agents, and plastic stabilizers in polyvinyl chloride (PVC) plastics. Federal and state regulatory standards have helped to reduce lead exposure.



Blood lead levels have decreased over the last 30 years for all age groups, correlating with the ban on leaded gasoline, paint, pipe, plumbing solder and food cans.

INTERESTING INFO

Most studies show that exposure to lead-contaminated water alone would not be likely to elevate blood lead levels in most adults, even exposure to water with a lead content close to the EPA action level of 15 parts per billion (ppb). Risk will vary, however, depending on the individual, the circumstances, and the amount of water consumed. For example, infants who drink formula prepared with lead-contaminated water may be at a higher risk because of the large volume of water they consume relative to their body size.

Lead in Drinking Water

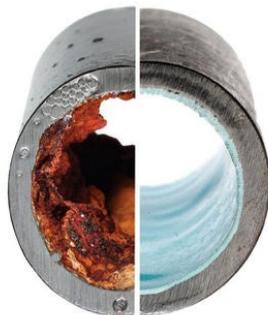
Prior to the EPA initiated Clean Water Act in 2006, tap water used to contribute as much as 10-20% of the total lead exposure in the United States. Source water, such as lakes, rivers and streams rarely contain detectible levels of lead. Lead is introduced into drinking water primarily through the distribution system used to carry water to your home and more importantly from the plumbing within your home. In homes built prior to 1930's, water pipes were primarily made from lead material. Lead pipes can be identified because the piping tends to have a dull gray color, can be scratched with a key, and a magnet will not stick to the piping. Copper piping has often been used since the 1930's for home plumbing, but the solder (an alloy of tin with lead and antimony) used to fuse the pipes together typically contained elevated levels of lead prior to 1986. Lead can also corrode from metal faucets and fixtures made from brass, an alloy of copper and zinc that often contains lead impurities, including chrome-plated brass fixtures. Therefore a home with no copper or lead pipe may still have elevated lead levels due to brass fixtures. Lead may also leech into drinking water from the corrosion of brass fittings on certain types of submersible pumps used in groundwater wells through the mid 1990's. Plumbing fixtures with a lead content of less than 8% used to be legally defined as "lead free" but since 2014, "lead free" refers to fixtures with a lead content of 0.25% or less. Although new laws are in place to restrict the amount of lead in new pipes, fixtures and solder, homes may still contain older materials that were manufactured with a higher lead content.

Lead & Copper Corrosion in Pipe

Water dissolves lead in a process called corrosion. Corrosion is defined as a dissolving or wearing away of metal caused by a chemical reaction. The amount of lead corroded from metal plumbing is partially dependent on water chemistry. For example, softened water (low in dissolved solids like calcium and magnesium) tends to be more corrosive than hard water, and warm water is more corrosive than cold water. The common practice of grounding electrical connections to water pipes also can increase corrosion.

To prevent corrosion of pipe material, a corrosion inhibitor is typically added to the drinking water supply. Most water supplies add

phosphate corrosion inhibitors. CLCJAWA adds a drinking water certified corrosion inhibitor called orthophosphate on a continuous basis to maintain a phosphate film between your home's metal plumbing and your drinking water.



How to Reduce Lead Exposure in your Home

Simple steps like keeping your home clean and well-maintained will go a long way in preventing lead exposure. **If you have lead material in your home** you can lower the chances of exposure by taking these steps:

- ◆ Replace lead containing plumbing and fixtures.
- ◆ Inspect and maintain all painted surfaces to prevent paint deterioration.
- ◆ Drink or cook only with water that comes out of the cold tap. Water that comes out of the tap warm or hot can contain much higher levels of lead. Boiling water will NOT reduce the amount of lead in your water.
- ◆ Flush water outlets used for drinking or food preparation. Allow the cold water to run for 3-5 minutes before using it for food or drink preparation.
- ◆ Clean debris out of outlet screens or faucet aerators on a regular basis.
- ◆ Install a home water filtration system or point of source water filter that has been certified by an independent testing organization to reduce or eliminate lead.
- ◆ Address water damage quickly and completely.
- ◆ Keep your home clean and dust-free. Lead dust can be inhaled.
- ◆ Clean around painted areas where friction can generate dust, such as doors, windows, and drawers. Wipe these areas with a wet sponge or rag to remove paint chips or dust.
- ◆ Wash children's hands, bottles, pacifiers and toys often.
- ◆ Ensure that your family members eat well-balanced meals. Children with healthy diets absorb less lead.

The best way to reduce lead exposure in your drinking water is to replace lead containing plumbing and fixtures on your premises.

History of the Lead & Copper Rule

In 1991, the Lead and Copper Rule (LCR) was put in place by the Environmental Protection Agency (EPA) to minimize the lead and copper in drinking water. The rule set a maximum contaminant level goal of zero for drinking water with a focus on using treatment techniques to reduce corrosion in the distribution system.

In 2000, revisions to the LCR included streamlining monitoring that communities were required to do. Communities that demonstrated consistently low levels of copper and lead could be put on a 3 year sampling schedule.

In 2007, the EPA revised the LCR to enhance implementation in the areas of monitoring, treatment, customer awareness, and lead service line replacement. The update also enhanced public education requirements and ensured drinking water consumers receive meaningful, timely and useful information needed to help them limit their exposure to lead in drinking water.

Currently, the EPA is working on a long-term revision to the LCR which would improve the effectiveness of corrosion control treatment and trigger additional actions that reduce the public's exposure to lead and copper when corrosion control treatment alone is not effective.

Symptoms of Lead Exposure

(Lead exposure is best diagnosed by your physician)

Symptoms in Children:

Developmental delay
Learning difficulties
Irritability
Loss of appetite
Weight loss
Sluggishness & fatigue
Abdominal pain
Vomiting
Constipation
Hearing loss

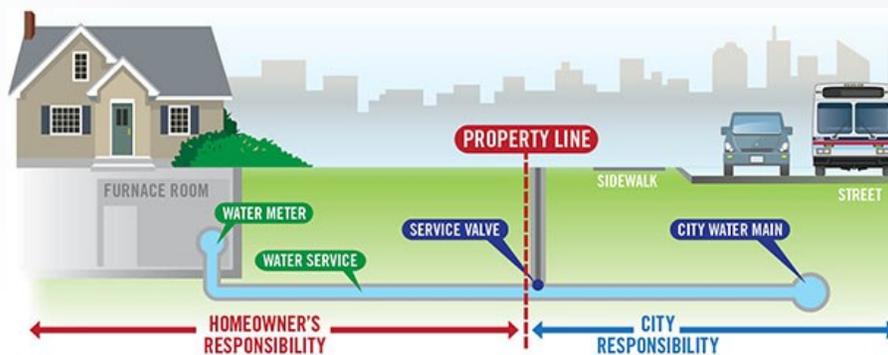
Symptoms in Adults:

High blood pressure
Abdominal pain
Constipation
Joint & muscle pains
Declines in mental functioning
Pain, numbness or tingling of the extremities
Headache, memory loss
Mood disorders
Reduced/abnormal sperm count

Pregnant women can pass lead poison on to a growing fetus which can cause high blood pressure, miscarriage, premature delivery and learning and behavior problems in a child.

Got Lead? Where to go for Testing

Local Health Departments or contract laboratories can assist homeowners in having their water tested for lead and copper. Contact the Lake County Health Department at 847-337-8017 for more information regarding the testing available or you can find local contact information for testing your water for lead by calling EPA's Safe Drinking Water Hotline at 800-426-4791. If you have detectable lead levels in your water, you will then need to determine if it is due to copper or lead plumbing within your home, from the service line running from your home to the service connection at the roadway or from another source. Both your plumbing and your water service line are your responsibility. Contact a qualified plumber for questions about your plumbing.



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