

Lead

Lead in drinking water is toxic, even at very low levels. The U. S. Environmental Protection Agency eliminated the maximum contaminant level for lead in 1992, replacing it with an action level of 0.015 milligrams per liter (mg/l) as measured at the consumers tap. Because of the health effects associated with lead, even at very low levels, any amount of lead in drinking water is undesirable.

CAUSE:

It is rare for lead to be found naturally in drinking water. The primary cause of lead in drinking water is the corrosion of home plumbing materials containing lead. This includes lead solder and flux used to join copper pipes, lead pipes and service connections, and lead alloy pipes.

A soft, acidic water will more readily dissolve lead. The concentration of lead in water will increase with the length of time the water stands in the pipes.

Houses less than five years old with lead in the plumbing materials are more likely to have elevated lead in the drinking water. With time, most plumbing will develop a protective mineral coating inside the pipes which insulates them from the corrosive action of the water. During the first five years, the plumbing has not had time to develop this protective coating and is more subject to corrosion by the water.

EFFECTS:

Lead is toxic to the human body. It can cause damage to the brain, nervous system, kidneys, and red blood cells. **Pregnant women, fetuses, infants, and young children are at**

the greatest risk of lead poisoning, even if exposed to lead for only a short time. Infants, who consume most of their food in liquid form (baby formula), can receive very large doses of lead through drinking water.

Growing children absorb lead more rapidly than adults. Low levels of lead can have much larger impact on their small bodies than on an adult. Overexposure to lead during this stage of life can permanently stunt their growth.

TREATMENT:

1. **Immediate Steps:** Do not drink or cook with water that has been in contact with the plumbing for longer than six hours (such as overnight or during a work day). Before using, flush the faucet by letting it run until the water feels cooler. Normally, two to three minutes of flushing will be sufficient to remove the metal-containing water from the pipes.

Never use hot water from the tap to cook with. Hot water is more corrosive than cold water and may contain higher levels of lead. *Especially do not use hot water from the tap for making infant formula.*

2. **Corrosive Water:** Acidic water can be treated to make it less corrosive. Please refer to the Section entitled “Corrosive (Acidic) Water” for further information.
3. **Point-of-Use Devices:** In some cases, it will only be necessary to treat the small amount of water actually used for drinking and cooking. Here, point-of-use devices are a reasonable alternative. Point-of-use devices are small treatment units which produce up to 15 gallons of water per day for drinking and cooking. The device is usually located near the kitchen sink. All of the methods described below are available as point-of-use devices.
4. **Reverse Osmosis (RO):** RO units remove dissolved minerals (including lead) by forcing the water, under pressure, through a synthetic membrane. The membrane contains microscopic pores that will allow only molecules of a certain size to pass through. Since the molecules of dissolved minerals are large in comparison to water molecules, the water will squeeze through the membrane leaving the minerals behind. A properly operated RO unit is capable of removing 90 to 99 percent of the dissolved lead from a water supply.
5. **Distillation:** Distillation units are better known as “stills.” They are made of either heat resistant glass or stainless steel. Stills work by heating small amounts (less than 2 gallons) of water to produce steam. The steam is then collected and condensed back into water. The dissolved lead will not vaporize and is left behind in the heating chamber.

Stills require frequent, rigorous cleaning to remove the baked-on mineral salts. The “flat” taste from boiling the water can be reduced by pouring the water back and forth between two containers to aerate it.

6. **Bottled Water:** Where treatment is not desirable or practical, bottled water may be used as an alternative source of drinking water. A chemical analysis of the water (including the lead concentration) will sometimes be listed on the label.