

## Heavy Metals in Drinking Water

Heavy metals in water refer to heavy, dense, metallic elements that occur in trace levels, but are very toxic and tend to accumulate. .

Most heavy metals are too rarely found in water to justify government regulation, but a few have been given an MCL (Maximum Contaminant Limit) by the EPA (Environmental Protection Agency).

These include:

**Cadmium** occurs mostly in association with zinc and gets into water from corrosion of zinc coated (“galvanized”) pipes and fittings.

**Antimony** occurs mostly in association with lead, where it is used as a hardening agent. It gets into water from corrosion of lead pipes and fittings, but even then it is rarely detectable. More antimony is found in food than water.

**Barium** is chemically similar to calcium and magnesium and is usually found in conjunction with them. It is not very toxic and is rarely found at toxic levels. However, it is common at low levels in hard water areas.

**Mercury** is notorious as an environmental toxin, but not typically a problem in water supplies. Certain bacteria are able to transform it into methyl mercury, which is concentrated in the food chain and can cause malformations.

**Thallium** is as toxic as lead or mercury, but is extremely rare and not often a problem in water.

**Lead** is the most significant of all the heavy metals because it is both very toxic and very common. It gets into water from corrosion of plumbing materials, where lead has been used freely since Roman times. In addition, lead can be found in the solder used to join copper pipes, and in fittings and faucets made from brass.

**Copper and Lead** are regulated together because both are commonly used in plumbing materials and because they are corrodible. A few tenths of a ppm of copper is common and not a problem, but if as much as 1.3 ppm or 15 ppb lead is detected in tap water, the waterworks are required to modify the water chemistry to make it less corrosive.

### Detecting Heavy Metals in Your Water

Heavy metals cannot be detected by sight, smell or taste. If you are concerned with heavy metals in your drinking water, you should have the water tested by a reliable chemical laboratory. First, request a copy of the most recent analysis done by the local waterworks agency, which is required by law to test and report. In addition, the waterworks agency is required to notify you if their own testing for lead and copper shows even a hint of a problem with corrosion of plumbing materials.

If you have a private well, call the county environment or health office and ask if your region has any history of heavy metal problems in ground water.

### Remedies

If you find that heavy metals are present at significant levels in your water, here are some things you can do:

If the problem is corrosion of plumbing materials (lead, copper, cadmium), most of the corrosion by-products can be removed by filters, which have high efficiency for fine (sub-micron) particles. Look for filtration systems that are NSF certified for lead to be sure. Many point-of-use products have been tested and certified by NSF International for reduction of one or more heavy metals. These are guaranteed effective over a wide range of conditions.

Typically the size of a household fire extinguisher, POU systems are installed on the cold water line to a single faucet or outlet. They are designed for consumer use and are installed under the kitchen sink. Commercial systems are larger in size due to their increased capacity and are typically wall-mounted near the incoming water line. As water passes through the POU system, sediment, particles, bacteria and many unwanted chemicals are removed by the system’s main ingredient, activated carbon.

Activated carbon is an extremely porous material that attracts and holds harmful contaminants in the water through a process known as adsorption.