



DRINKING WATER CORROSION PROBLEMS

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The following information was taken from <http://soiltesting.tamu.edu/publications/watercorrosion.pdf>

One of the most common problems affecting domestic water supplies is corrosion, a chemical process that slowly dissolves metal, resulting in deterioration and failure of plumbing pipes, fixtures and water using equipment. One type of corrosion attacks and gradually thins the entire metal surface, often causing red-colored stains in iron or steel plumbing systems or blue-green stains in copper and brass plumbing systems. Another type of corrosion attacks small areas where deep pits can develop and penetrate pipe or tank walls. This type of corrosion may not add significant amounts of iron or copper to the water, but can create small holes in a pipe or tank that destroy its usefulness, cause water leaks, and result in major water damage to a home or business. A third type of corrosion caused by the oxidation of metals involves conversion of copper or other base metal to an oxidized form in a process similar to the rusting of steel. It often results in reduced water flow through supply lines and destruction of water valves and other machined water flow control surfaces, thus resulting in internal and external leaks at valves and faucets. This type of corrosion does not necessarily occur due to the water chemistry, but is caused by exposure of the outside surface of the plumbing supply lines to soil or other corrosive environments. The most commonly referred to toxic metals: Lead and Copper are usually found in older homes and are almost always caused by leaching caused by corrosion. Elevated levels of lead can result in physical and mental development problems in children, and high blood pressure and kidney problems in adults. Elevated levels of copper can cause gastrointestinal problems and with long-term exposure result in liver and kidney damage. The other two most commonly found metals are iron and zinc which can cause water to have a metallic taste.

WHAT ARE THE CAUSES OF CORROSION?

Corrosion is a natural process that occurs when metals are in contact with oxygen and react to form metal oxides. All water is corrosive to some degree as it contains some amount of dissolved oxygen. The rate of corrosion depends on a number of factors including acidity or low pH, electrical conductivity, oxygen concentration and water temperature. Each of these factors play a key role in the corrosion process.

HOW DO I KNOW IF THERE IS A CORROSION PROBLEM?

Most people first realize they have corrosive water because of its negative effects. Common symptoms are:

- The cold water has a bitter taste when you first draw it in the morning, and flushing the line by running the water for a few seconds improves taste
- Blue-green stains in sinks and/or at the joints of copper piping.
- Water leaks in floor, wall or ceiling areas as a result of pin-size or larger holes in metal pipes.

HOW CAN CORROSION BE CONTROLLED?

Eliminating corrosion completely is generally not possible, but it often can be reduced to acceptable levels by treatment. The appropriate treatment method depends entirely on the type and causes of the corrosion. You can contact your water supplier for information on what they may already be doing with your water for corrosion control purposes.

This information was taken from the following existing publications:

Hermanson, R.E. 1991. Corrosion from Domestic Water. EB1581. Washington State University. Pullman WA.

Oram, B. Corrosion, Saturation Index, Balanced Water in Drinking Water Systems. 2009. Wilkes University Center for Environmental Quality. Wilkes-Barre, PA.

Swistock, B.R., W.E.Sharpe, and P.D. Robillard. 2001. Corrosive Water Problems. F 137, Penn State University. University Park, PA. 💧💧

