

CORROSION CONTROL INFO

By Richard Winters

Controlling metal pipe corrosion in municipal water systems is a major concern for local drinking water suppliers. Meeting EPA standards for allowable lead and copper in potable water is critical, not just from a health point of view, but also from the perspective of operational cost efficiency. Stabilizing the water is often the simplest form of corrosion control. When stabilizing corrosive water, alkalinity in the form of lime, soda ash, or caustic soda is usually added to saturate or slightly supersaturate the water with calcium carbonate so that it is stable or slightly scale-forming.

Phosphates are also used for potable water treatment to reduce corrosion in distribution systems. In water treatment general orthophosphate and polyphosphate are used. They may be used either alone or mixed to stabilize water quality and minimize corrosion in drinking water systems. Polyphosphate-type chemicals react with soluble metals (Fe, Mn, Ca, Mg, etc..) by sequestering (binding) the metals to maintain their solubility in water. In the treatment of potable (drinking) water polyphosphates are used to:

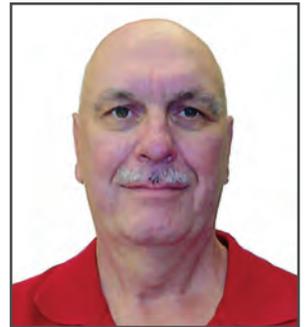
- Prevent "red" (from iron) and "black" (from manganese) water
- Reduce soluble lead and copper in potable water
- Clean or dissolve precipitated mineral scale already existent in water distribution lines
- Prevent and/or retard scale formation (from minerals depositing) and corrosion (from low ph and/or dissimilar metals) in the water distribution system

Orthophosphate is a common corrosion inhibitor used by water suppliers to prevent lead pipes from leaching. When orthophosphate water treatment is added to a water source, it reacts with lead to create a mineral-like crust inside of the lead pipe. This crust acts as a coating which prevents further lead corrosion.

The dosing rate will always be dependent on your water source. That being said, I have found through my travels that a dosing rate of: 1.0 – 3.5 mg/l seems to be the best. Also adjusting your ph to somewhere between 7.3 and 7.6 increases the effectiveness of the product. Studies indicate a ratio of 65% polyphosphate to 35 % orthophosphate provides the best corrosion inhibition on an inorganic phosphate treatment program. Experience has shown that polyphosphates not only inhibit scale formation, but they can also help remove existing hard deposited carbonate or sulfate scale. Pipelines carrying potable water treated with polyphosphate for extended periods of time (several months) first show a gradual softening of the scale followed by disintegration and removal. The soft scale particles are deflocculated by the polyphosphate and carried away resulting in a clean piping system.

An added bonus to using phosphates in your distribution system can be seen in the reduction of your chlorine demand. Your customers will see an added benefit as well as their hot water heaters and boilers will last longer with the added protection provided.

There is much more to come on this topic as we anticipate the Lead & Copper Rule Revision (LCRR). Rest assured, your NYRWA will provide the most current and relevant information once the revision is completed and authorized. 💧💧💧



Richard Winters
Circuit Rider
winters@nyruralwater.org