

Copper-Silver Ionization Water Treatment and Building Water Systems

What Is Copper-Silver Ionization Water Treatment?

Copper-silver ionization water treatment is EPA-approved for disinfection and is most commonly used to control Legionella bacteria in building water networks. The water treatment uses a process where very small amounts of ionic copper and silver are added to water to eliminate bacteria. When this type of disinfection treatment is used, safe levels of copper and silver in the water are maintained depending on the type of controller, water usage, and other conditions in the building system.

What Are Copper and Silver?

Copper and silver are naturally occurring metals used to make many products, including copper-silver electrodes. Copper is commonly used for plumbing because of its lightweight nature and durability and has natural antimicrobial properties (which means bacteria do not grow easily on its surface). Silver is a well-known bactericide that is commonly used in the medical industry to prevent infections.

Both copper and silver are required to control and kill Legionella in building water distribution systems. Copper alone is a well-known algacide that kills algae. Silver alone is an excellent bactericide that kills most bacteria. However, for Legionella, both are needed.

What Are the Effects of Copper and Silver?

It is common to see existing copper levels in potable water ranging from 0.01ppm to 3.5ppm. Rarely are copper levels over 3.5ppm unless observing a new plumbing system where temporary values could be higher for a short period of time until the system is properly flushed. Copper-silver ionization systems typically inject a minimum of 0.4ppm ionic copper into water while keeping the total measurable values under 1.3ppm (the high limit).

With extremely high levels of copper ingestion over time (from drinking the water), a person could experience abdominal pain, nausea, and vomiting. Generally, people do not experience these symptoms because the water will smell or taste bad when copper levels exceed the permissible high limit of 1.3 ppm.

What if the Copper-Silver Values Are Higher Than Required?

Copper and silver levels detected in water samples do not cause health effects at recommended efficacy levels. In fact, the New York City Department of Health and Mental Hygiene (NYC Health Department) works with buildings that use copper-silver ionization water treatment and does not recommend changes in water use, even if there are temporary elevations in copper or silver.

2025 Next-Generation copper-silver ionization systems, CSIPhoenix®, is the only known CSI technology that can prevent over-ionization possibilities by providing 24/7 in-line water monitoring.



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1-888-988-4667
solutions@csiphoenix.com

