OVERVIEW BY JOHN HOPKINS UNIVERSITY

Disinfection Methods for Legionella in Potable Water Systems

Parameters	Copper/Silver Ionization	Continuous Chlorination	Heat and Flush	Chlorine Dioxide
Concentration Applied	Cu = 0.2 - 0.8 ppm Ag = 0.02 - 0.08 ppm	2 - 4 ppm as free chlorine	160 F for 30 min	0.5 - 1 ppm as ClO_2
On-site efficacy documented in peer-reviewed literature	Yes	Yes	Yes	Yes
Residual protection throughout the distribution system	Yes	Yes	No	Yes
Time to recolonization after system shut-down	6 -12 weeks	1 -2 weeks	Varies[1]	No information available
Temperature	Residuals unaffected by high temperature	Residuals decrease as temperature increases	NA[2]	Residuals decrease as temperature increases
pH	Elevated pH (>8.5) may affect efficacy	Elevated pH (>8.0) affects efficacy	No effect	No effect
Disinfection by-product	None known	Trihalomethane (THMs)	None	Chlorate and Chlorite
Taste and odors	None	Yes	No	Minimal at high concentrations
Pipe corrosion	Non observed	Highly corrosive	Old pipe may be affected	Corrosive
Maintenance issues	Scale control Routine electrode cleaning Routine ion monitoring with AA or ICP[3]	Chlorine storage Concentration control and monitoring. Corrosion control with silicate	Scalding possible Labor intensive	Concentration control and monitoring using DPD method

1. The delay of recolonization is variable. Elevated hot water temperature can delay recolonization not applicable.
2. Atomic absorption (AA)/Inductively coupled plasma mass spectroscopy (ICP)Reference

www.legionella.org/biocides_research1.htm