

The Halogens

– A closer look into the halogens –

Introduction

Halogens are cheap oxidizing biocides, which provide excellent bulk water sterilization. These are available as liquid or solid products and are selected, like most products, based on what is to be accomplished under your exact conditions.

Chlorine (bleach) is preferred based on price; it is easy to use, comes in liquid form, and kills bacteria in pH conditions below 8.3. Bromine is becoming more widely used due to increases in raw water pH, and is effective above a pH of 8.3.

History

In 1992, the EPA issued new rulings on allowable lead levels in drinking water. The old 50 PPB standard for lead was replaced with the new 15 PPB standard. Many municipal supplies now increase the pH to reduce lead-leaching, and this has been effective.

Others have opted to add corrosion inhibitors, such as Orthophosphate. The city of New York adds approximately 1 PPM Orthophosphate and carries a free halogen residual of 1.0 PPM.

The Situation

There is not enough testing being performed to ensure adequate copper protection and these situations are worsening.

The water treatment suppliers are currently looking for up to \$850 per service hour. This means less time on-site and less time spent testing.

In order to determine if there is enough copper corrosion inhibitor in a system, you must first run a copper test. To do this, multiply the copper residual by two in order to find out the demand of the water for copper corrosion inhibitor. Then, run a copper corrosion inhibitor test and subtract the demands. If the result is positive, you have protection.

Things to Keep In Mind

The replacement costs for improperly treated systems can easily soar into the millions of dollars.

On the topic of testing copper corrosion inhibitors, water treatment suppliers generally will have many excuses, such as that there is enough azole in the drum, the copper corrosion coupons look great, the field tests take too much time/that they do not have the necessary field equipment, or that the azole tests are inaccurate.

Tolytriazole is absorbed by the system at a different rate than the steel corrosion inhibitor. Halogens and UV degrade the azole. The chemistry at the hotter condenser tube is different than the chemistry in the cooler bulk water, and the field test for azole is accurate enough.