FACTS ABOUT LEGIONELLA REMEDIATION OR PREVENTION WITHIN FACILITY POTABLE WATER DISTRIBUTION NETWORKS

Legionella Growth Prevention Tech 101

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Part 2 of 2:

Legionella Growth Prevention Tech 101

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As mentioned in part 1, "The Biofilm Identity," biofilm is known by industry experts to play a critical role in the protection, growth and spread of Legionella bacteria within facility potable water distribution networks. These elaborate water networks are commonly found in healthcare facilities, nursing homes, hotels and many other larger-type facilities.

The technologies used to address the relative risks associated to Legionella exposure can vary based on if the facility is in "remediation" or "preventative" mode.

Either way, when secondary water disinfection is required for Legionella growth control or prevention, a reliable secondary water treatment technology will be required to address the issue.

The following will attempt to guide you and shed some light on the advantages and limitations associated with various known and accepted water treatment technologies linked to Legionella growth-prevention issues.

Do you need a short-term or long-term water treatment technology?

Unless you are in remediation mode with existing Legionella issues in your facility, chances are you should install a long-term "preventative" type secondary water treatment technology to "prevent" potentially dangerous Legionella exposure to facility occupants.

Additionally, as part of ASHARE 188, most facilities with a relative risk of Legionella growth will be advised to implement a preventative-type secondary water treatment technology. The same can be said in relation to the summer 2017 Legionella directive issued by the CMS in the USA.

Given the nature of facility occupants or the age of the facility, higher-risk facilities normally include hospitals, nursing homes and hotels.

Yet what if you want to deal with existing Legionella issues in your facility potable water distribution network and require a short-term solution? What should you do to fix this quickly in anticipation of a long-term solution?

What about UV, filtration, ozone short-term Legionella growth remediation water treatment technologies?

All of these technologies are extremely reliable and well proven, yet for the most part, they provide little to no residual effect that can be distributed within a facility's potable water distribution systems. Since the objective to prevent or remediate Legionella growth requires a "Systemic" type of technology that can attack biofilm, UV, filtration or ozone are not considered to be appropriate as a first line of defense against biofilm-related Legionella growth.

Short-term Legionella growth remediation water treatment technologies include:

A: Hyper Chlorination
B: Thermal Eradication

I'm not going to go into great detail here, yet the big lines are simple. Both Hyper-Chlorination and Thermal Eradication are short-term Legionella growth remediation methods. They will provide you with a three to six week window before you start to see those Legionella CFU counts start to rise again. I always recommend one of these approaches when a facility is in remediation mode and need to fix the issue immediately to lower the exposure risks associated with Legionella.

Additional realities associated with these two methods include strong chlorine vapors or the risk of severe scalding, and in both cases, the reality of physical damage to the plumbing and its features. All distal outlets (faucets, showers, etc.) require flushing and facility occupants, and staff, run the risks of chemical exposure or scalding. This is definitely not discreet and will cause major inconveniences to facility occupants.

That said, when you have no other alternative, a short-term secondary water treatment remediation should protect facility occupants from Legionella exposure for a few weeks while you develop a long-term Legionella growth prevention strategy.

Long-term Legionella growth prevention water treatment technologies include:

A: Chloramines (NH2Cl)
B: Chlorine Dioxide (ClO2)
C: Copper Silver Ionization - CSI ($Cu^{2+}Ag^{+}$)

Again, I'm not going to go into great details here, but the big lines are simple. Chloramines and Chlorine Dioxide require on-site chemical storage and handling of either Ammonia, Sodium Chlorite or Sodium Chlorate. Both of these technologies generate EPA-regulated byproducts that need to be monitored.

Chlorine dioxide (ClO2) is considered to be less corrosive than regular chlorine and has shown better performance than both Chlorine or Thermal eradication. Chlorine dioxide will also eventually penetrate biofilm yet can take up to 17 months to accomplish measurable results in Legionella growth control.

ClO2 must be generated on-site; it's illegal to transport ClO2, and the generators require a relatively larger technology footprint compared to other technologies, and has also been reported to develop hardware corrosion issues that require good service contracts.

For **Chloramines (NH2Cl),** this chemical has shown to be more "stable" than Chlorine or Chlorine dioxide. The word "stable" means that, unlike chlorine alone, NH2Cl stays in the water longer without evaporating. This is not necessarily a good thing (look into it). Also, it does not provide as good efficacy in killing bacteria compared to practically all other technologies. It's easy to produce with the use of ammonia combined with chlorine and works best in pH values of 8.3. The THM byproducts associated with this method are approximately a third of those of regular Cl2.

Chloramine is known to cause dangerous vapor byproducts that can accumulate in enclosed areas such as showers, utility rooms, mechanical rooms basically any small room with a faucet. It's also associated with rapid infrastructure deterioration and degradation of valves and fittings. It's 200 times less effective than chlorine in killing e-coli bacteria. Another red flag for healthcare facilities is that it affects dialysis equipment and can cause potential anemia in patient care. It has limited to no biofilm penetration and can require periodical use of higher chlorine concentrations. Legionella growth prevention related studies are very limited. You will be required to have on-site ammonia storage, and potential overdosing will result in the production of dichlorimines or nitrogene trichlorides. All in all, if you absolutely want to use chemicals, I'd use something other than chloramines for Legionella prevention.

Facts about Legionella Remediation or Prevention Within Facility Potable Water Distribution Networks

Can Legionella Prevention be Productive & Easy?
I say "YES!" As long as you know what you're doing naturally. So let's look into Copper Silver Ionization (CSI).

Copper Silver Ionization (CSI) is arguably one of those technologies that you can try to hate, and if you cherry pick the data, and not actually understand the details of what is presented to you, you'll have a false sense of knowing what you believe is reality and disregard the technology completely. This is especially prevalent by those with an agenda to promote alternate technologies that clearly don't perform as well as CSI Technology. After all, how else can they compete? Yes copper silver ionization requires monthly cleaning maintenance, yes the alloy needs to be replaced yearly. Only a handful of business manufacture this technology and it is a recognized by the WHO, EPA and CDC. No harmful byproducts and it's discreet to use and implement.

Ask Questions!
I'll occasionally get the pointed question from someone who discovered something negative about the technology and tries to discredit its merits. The fun part for me is that when you're an industry expert on the subject matter of CSI engineering and technology development (so I'm told), explaining the realities of any such assumption can be addressed with facts and science. Not my opinion. Who cares about my opinion anyway? But it's hard to dismiss the preventable or inappropriate circumstances that can cause some technology shortcomings in the first place. The same can be said for any technology.

The fact is whenever you read or hear that Copper Silver Ionization technology failed, regardless of where or when it was used, always go deeper and ask, "why did it fail?" and you'll discover the real reasons.

As a scientist, I always ask the question "why" and then go look for the answers. I have to admit that you need to somewhat understand the technology in order to find the holes, yet in all cases, the faults that caused the issues were present. For almost 20 years, every single time copper silver ionization technology was accused of having shortcomings (and there are much less than you'd expect), I'd take the time to investigate. Every single time I was surprised to discover that 100% of the shortcomings scientific or field related were all either linked to ionic values below the industry requirements of 0.40 ppm Cu+2 and 0.04 ppm Ag+, lack of maintenance, depleted electrodes were not replaced or that the technology used was simply too small, under powered and not engineered for Legionella growth prevention.

Copper Silver Ionization is a technology that has its place in the industry. Lack of education is not the basis to dismiss a nearly perfect track record.

I hope this article sheds light on the realities associated with Legionella growth prevention technologies. Remember, if you keep asking questions, you'll come to your own conclusions on which technology best fits your expectations.

For additional information on "Systemic Long-Term" Legionella Control and Prevention for your facility potable water distribution network, please visit: **http://csidefender.com**

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