



# FACTS ABOUT LEGIONELLA REMEDICATION OR PREVENTION WITHIN FACILITY POTABLE WATER DISTRIBUTION NETWORKS

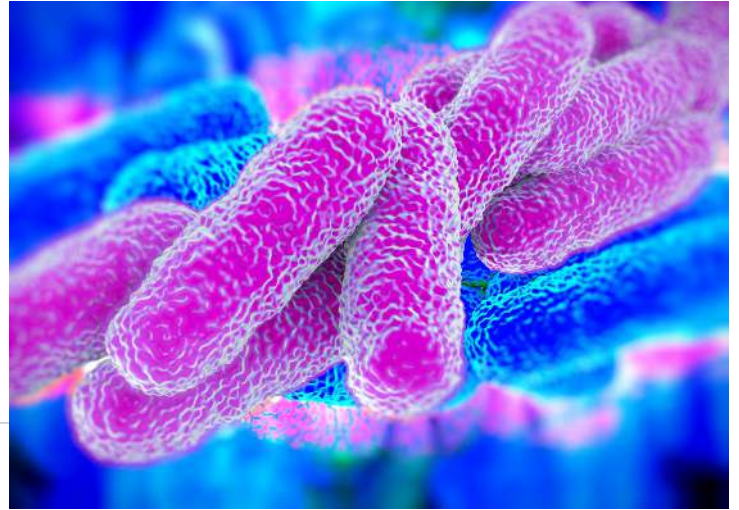


Part 1 of 2:

# The “Biofilm” Identity

January 19, 2019

By: Chris Gauthier, Environmental Legionella Microbiologist



Most industry experts agree that consultant engineers, facility managers, owners or infection control personnel, at some point in their careers, will be faced with the reality of environmental facility safety issues associated to:

- A:** Legionella bacteria (LB) prevention,
- B:** Legionella bacteria remediation, or
- C:** ASHRAE188 compliance recommendations

We can even assume that upon facing Legionella related issues; most will embark on a “quest” to identify the best facility potable water treatment technology that best fits their particular situation.

From what I’ve seen in the past, this “quest” is normally time consuming and in the end, the most Frequently Asked Questions (FAQ) in relation to Legionella control and prevention are:

- “What should I do about Legionella control?”
- “What is the best water treatment protocol or technology to implement?”
- “What is the most affordable way to go?”
- “Which technology is the easiest to maintain?”
- “How much will be the operational costs?”
- “What are the risk factors?”
- “Who can help?”
- “Should we seek external help?”

All of these FAQs are quite common and very important. With ASHRAE 188 “Legionella Prevention Standard” an industry reality, most of these questions are now more and more frequent.

This first installment of two-part series will attempt to shed light on facility water treatment technologies intended to control and/or prevent Legionella growth within facility potable water distribution networks. Facilities such as hospitals, hotels, nursing homes, military structures, condominiums, cruise ships and other types of buildings that have an elaborate water distributions network.

Wait! Before talking about potable water treatment technologies for Legionella control and prevention, let’s spend some time on a the subject of “Biofilm”.

## The “Biofilm” Identity

When concerns arise over Legionella control and prevention, I commonly hear one of the following:

**A:** Potable city water is the source and cause of Legionella outbreak or

**B:** City potable water is how Legionella bacteria is spread once it becomes infected.

Both are somewhat true yet not 100% accurate. In reality, the actual source of a Legionella outbreak, when dealing with facility potable water distribution networks, requires 3 key environmental components:

**A:** A source of contamination (i.e. the municipal water supply normally has LB).

**B:** Warm water hovering around ideal Legionella growth temperatures of between 68°F - 122°F (20°C - 50°C) and

**C:** The presence of biofilm.

Fact is that we cannot fully eradicate Legionella from the environment or municipal water supply. Also, facility engineers with experience will attest that the removal or elimination of biofilm from a facility water distribution network is practically impossible without causing major structural damage.

It is therefore a sound and practiced strategy to focus on making biofilm, found within the facility potable water distribution network, inhospitable to Legionella growth.

## So, what is biofilm?

A very simplistic definition of biofilm is that it's composed of three (3) primary components:

**A:** Organic living microorganisms,

**B:** Organic dead microorganisms and

**C:** Inorganics such as CaCO<sub>3</sub>, Fe, Mg, etc...

Over time, within a few months or years, depending on water quality, biofilm will accumulate or "grow" (I use this term loosely) to eventually accumulate a self-producing substance within the potable water plumbing and become part of the water distribution network piping.

Industry experts have named the composition of this self-producing biofilm substance as a "matrix" (No, it's not

the movie). This biofilm "matrix" generally provides two (2) things:

**A:** Provides nutrients to existing or newly colonized microorganisms.

**B:** Layers "thickness" can protect the existing microorganisms from most external aggressors such as chlorine or thermal eradication.

That said, biofilm is generally the true culprit associated to facility related Legionella growth within a potable water distribution network.

Water management experts with experience who understand the dynamics of Legionella control and prevention will normally focus on treating the biofilm.

**Why not remove the biofilm?** Experienced facility engineers will tell you first hand not to remove biofilm. Why? If biofilm is removed from a water distribution network, you will normally experience the wet inconvenience and costly reality of water pinholes leaks soon after.

## The "systemic strategy" of facility related Legionella control and prevention:

Since we can't remove biofilm, treating it will become the focus of a Legionella control or prevention intervention strategy. A "systemic strategy" can be accomplished by implementing one of few industry known and accepted facility potable water treatment technologies making biofilm inhospitable to microorganism growth.

## Can water testing leads to trouble?

For a few years now, some industry consultants have started promoting the practice of water sampling and testing for Legionella monitoring as a more affordable alternative to secondary facility potable water treatment. However, when you look at their respective business backgrounds, most, if not all of these consultants, are

directly or indirectly associated to laboratories that provide Legionella water testing and clearly have an agenda to promote their own services vs. the use of reliable water treatment technologies. For most facility owners and managers, this approach might seem easier to implement on the short term, and also more affordable, yet it only provides a false sense of security while lowering the perceived short term perceived Legionella prevention costs. The real danger does not go away.

The reality that surrounds this passive “water sampling & testing” approach is that sooner or later, Legionella will become problematic within a facility’s potable water distribution network and then instead of dealing with an affordable preventative approach, facility owners or managers are left with a costly “emergency” type Legionella remediation situation. They will still have to proceed with water sampling yet now they will also be required to face the reality that their facility is infected with Legionella. Furthermore, litigation risks associated to a preventable outbreak combined with dealing with health authorities and the media creates an environment that could have been prevented with secondary water treatment technology. I’d compare this to manually switching “off” an automobile’s air-bags or ABS systems until the moment someone thinks they need them.

In my opinion, and I emphasize “opinion”, regardless of what Legionella growth prevention technology you decide to install, any “ACTIVE” reputable technology is better than just relying on simple water testing to then wait for a Legionella issue to pop its head. And turning “off” a previously installed technology, and leaving it off, until it needs to be activated, could easily be considered as being negligent, reckless and even possibly criminal in nature. Why take the risk? Understand that I do encourage facilities take a proactive approach of regularly testing their potable water for Legionella presence yet this should be considered as an indicator to Legionella presence, not a first line of defense against these preventable public exposure risks.

For additional information on

“Systemic Long-Term” Legionella Control and Prevention for your facility potable water distribution network please visit:

<http://csidefender.com>

Disclaimer: The information contained in this whitepaper is for general guidance on matters of interest only. The author has made every attempt to ensure that the information contained in this document has been obtained from reliable source. All information in this document is provided “as is”, with no guarantee of completeness, accuracy, timeliness or of the results obtained from the use of this information, and without warranty of any kind, express or implied, including, but not limited to warranties of performance, merchantability and fitness for a particular purpose. In no event will the author, its related partnerships or corporations, or the partners, agents or employees thereof be liable to you or anyone else for any decision made or action taken in reliance on the information in this newsletter or for any consequential, special or similar damages, even if advised of the possibility of such damages. The author makes no representations as to the accuracy or any other aspect of information contained in this newsletter

**Water Treatment Legionella Strategy Basics:** Only a few facility water treatment technologies are capable of accomplishing Legionella control or prevention as a first line of defense. What you need to identify immediately is:

**A:** Are you in remediation mode? or

**B:** Are you in preventative mode?

Once you’ve answered these questions, you’ll then be able to proceed to the following questions.

### **Should you walk into door A, B or C?**

When we look at various industry accepted facility potable water treatment technologies, we can identify three (3) general classifications and one that should be avoided as a primary line of defense:

**A:** Targeted, (Example: U.V.)

**B:** Systemic Short-Term (Example: Cl2) and

**C:** Systemic Long-Term

(Example: Industrial Size Copper-Silver Ionization)

Each of these three (3) facility water treatment classification technologies have their own application advantages and limitations when dealing with Legionella issues.

All three classifications are important topics that will be included in part 2 of this whitepaper.

### **So, if you are a:**

**A:** Consultant engineer with a design stage construction project, or

**B:** Facility manager (or) owner

**C:** Infectious control or water management consultant,

I strongly encourage a “Systemic Long-Term” type legionella prevention technology such as a medical, commercial or military size copper silver ionization (CSI) unit. I’ll explain why in part 2 of this whitepaper.

# LEGIONELLA PROTECTION & COMPLIANCE FOR DOMESTIC HOT WATER NETWORKS

CSI DEFENDER



## TIME TO UPGRADE YOUR FACILITY PLUMBING

E-MAIL  
[support@csidefender.com](mailto:support@csidefender.com)

PHONE  
1-888-988-4667

© 2019 – All rights reserved – CSIDefender® Industries Inc.  
CSIDefender® and AquaLyse® are registered trademarks.  
Manufactured in CANADA / Country of Origin: CANADA  
Find a certified CSI vendor online at: <https://csidefender.com>

**CSI DEFENDER**<sup>®</sup>  
COPPER SILVER IONIZATION SOLUTIONS  
UL SP CE