

Mitigating
Increased
Risk of
Legionella in
Unoccupied
Buildings

They say the plumber protects the health of the nation, which is especially relevant right now as many buildings sit vacant or under-occupied. Water doesn't flow when buildings sit empty or lack occupancy. When water doesn't flow, the water becomes stagnant. The resulting areas of stagnation encourage biofilm growth, reduce water temperatures to levels that encourage Legionella growth, and reduce disinfectant levels.

A biofilm consists of a layer of microorganisms that stick to each other and materials around them, creating a protective layer that shields the bacteria living inside. Biofilms like to attach to hard surfaces like pipes and can be hard to remove once attached. They create health hazards because they serve as ideal hiding places and breeding zones for Legionella and other bacteria which linger, survive, and proliferate within the biofilm of premise plumbing systems.

In addition to allowing for biofilm formation, extended periods of vacancy can also alter the temperature of the water. Over time, the risk of Legionella increases as cold water tends to warm up and hot water cools down. The normal temperature range for Legionella bacteria to grow is between 68°F and 122°F, with the optimal temperatures for growth being 95°F to 115°F. Legionella starts to die above 122°F and dies more quickly as the temperature increases. As temperatures drop below 68°F, the bacteria becomes dormant.

The risk of Legionella increases if there are dead legs in the building's premise plumbing system. By definition, dead legs are sections of premise potable water piping with no flow, or low flow, due to system design and/or operation. Dead legs are usually the result of a section being altered, abandoned, capped, or simply forgotten. They can include isolated branch lines, pipe sections with closed valves, pipes with one end capped, closed cross connections, and any closed valve connected to a fixture, appliance or equipment.

How do dead legs happen? Even with the best of intentions, renovations and redesigns can lead to abandoned piping. In fact, dead legs can even be intentionally installed when planning in advance for future expansion. They can provide additional options for future construction and unanticipated needs. A dead leg can also be the outcome of a vacant wing or floor that currently isn't in use.

What are the consequences of dead legs? Dead legs with no flow or low flow contribute to stagnant water and biofilm buildup. While biofilm can begin very minutely, it can grow exponentially and serves as an excellent environment for Legionella and other bacteria to hide and thrive. Whether caused by no flow, low flow, or stagnation, the most common end results of biofilm are corrosion, temperature reduction, clogging, and reduced effectiveness of other Legionella risk mitigation solutions like disinfection.

Before occupants return to a vacant building, there are a number of activities that can be considered to help reduce the risk of Legionella and other waterborne pathogens:

- Conduct a risk assessment of the premise plumbing system
- Implement a flushing regime for facility staff
- When occupants return, instruct them to run any water for ten minutes prior to using it
- Hyper-chlorination, superheating, and flushing
- Install point-of-use filters for high-risk areas, or on all outlets to maximize safety
- If the building utilizes low flow faucets, consider that the risks of Legionella could be even higher

To help ensure the mitigation of Legionella and other waterborne pathogens, once the building returns to regular operation, it is highly recommended the facility manager continue opening up taps on a regular basis, and continue to implement other solutions from point-of-entry to point-of-use as needed.

Learn more about mitigating Legionella and other waterborne bacteria at www.legionella-strategies.com.