YWCT
Custom Cooling Towers

Legionellosis and cooling towers

General

Legionellosis is caused by the bacterium *legionella pneumophila*, considered the most aggressive water-inhabiting bacteria. Every year cases are reported around the world, with fatality rates between 5% and 30%.

Those infected are usually adults, smokers, and those suffering from chronic lung ailments; or elderly or immune-compromised patients. The bacteria enter the body via the airways, and multiplies in the lungs, where it can cause pneumonia, and in certain cases loss of consciousness and even death. The disease is diagnosed via blood testing and is treated with antibiotics.

Legionella bacteria are naturally occurring in water, reproduce rapidly in humid conditions, and are known for their ability to survive in harsh conditions. Under dry conditions and low temperatures, while they cannot reproduce, they stay alive.

Potential habitats

- Water systems between 25° C and 45° C
- Standing water, where a biofilm is liable to form, as well as sedimentary matter and dirt
- System parts that are not in continuous use, and/or where water is slow-flowing or standing
- Filters, washers, gaskets, and sealing fibers throughout the plumbing
- Sediment, rust, and mineral buildup in pipes, showers, and taps
- Cooling towers and condensation areas

Controlling legionella

According to Ministry of Health guidelines and CTI regulation WTB-148 there are several ways to prevent legionella reproduction in water systems:

- **Initial design –** Proper cooling tower design and installation can reduce the conditions supporting legionella colonies, biofilm formation and contaminants. Correct choice and combination of tower location, piping and coating materials, water flow and drainage, chemical feed, softening, electrolysis, and reliable

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and consistent monitoring of the quality of the water will protect against corrosion, mineral settling, and microbial growth, and thereby prevent legionella colonies from forming.

- **Tower maintenance –** Periodic testing, record-keeping, and familiarizing with the system components are an important part of preventing legionella colonies from forming, in addition to ensuring continuous water flow, filtering, disinfecting, and consistent dosage of chemicals (or other control method) to prevent corrosion, scaling and algae and biofilm growth . These maintenance measures contribute to the cooling tower's proper functioning.
- **Cleaning and disinfecting –** For the most part, disinfection takes place as part of routine cooling tower maintenance, in the form of shock-treating the tower pools with chlorine-based oxidizer such as chloride dioxide or hypochlorite. Prior to disinfecting, the drains must be closed to raise chlorine levels and prevent waste of the compounds. The amount of compound added is a function of the pool's volume plus the volume of the tower's plumbing system. The compound must be left in for 2-4 hours for maximum efficacy.

When treatment is not regular, or in the event that legionella is detected, locale-specific/spot treatment is recommended. If there is no appropriate regulator pump on site, the compound should be added manually directly into the tower pool. Remember to close drains for maximum efficacy.

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