Cooling Tower Water Treatment



30A avenue du Pacifique Laval Qc.H7N 3X5 Téléphone 450 490 3821 www.Hydro-Techniques.com

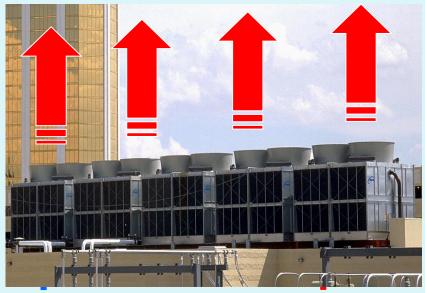
Hydro- Techniques Inc.

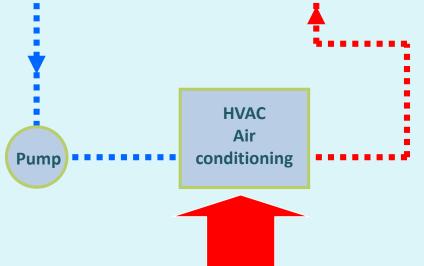


- About Hydro-Techniques Inc
- About Cooling Towers
 - Working principles
 - IAQ problems caused by cooling towers
 - The old way: chemical disinfection
- •Hydro-Techniques Inc solution
 - The new way : Copper + Silver Ionization System
 - How it works
 - Installation , operation and maintenance
 - Benefits
- Sizing
- Pricing

What is a cooling tower?





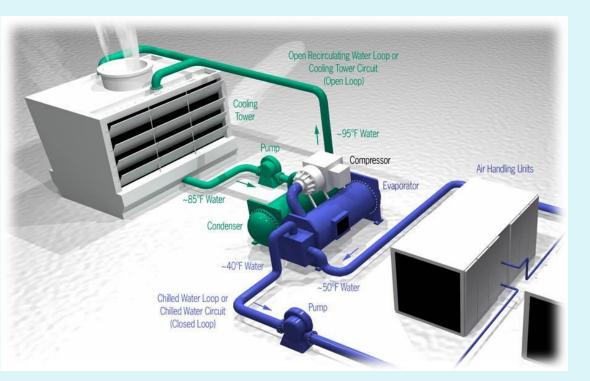


Cooling towers are the outside heat sinks that exhaust the heat carried by the air conditioning cooling water circuit used in buildings HVAC systems.

What is a cooling tower?









How it works



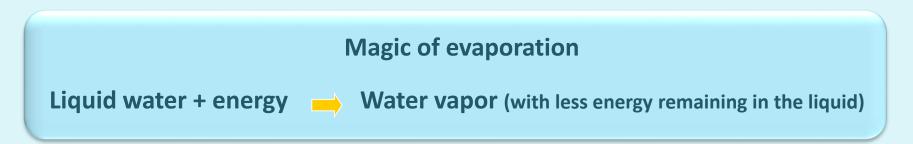
Evaporative cooling

Step 1:

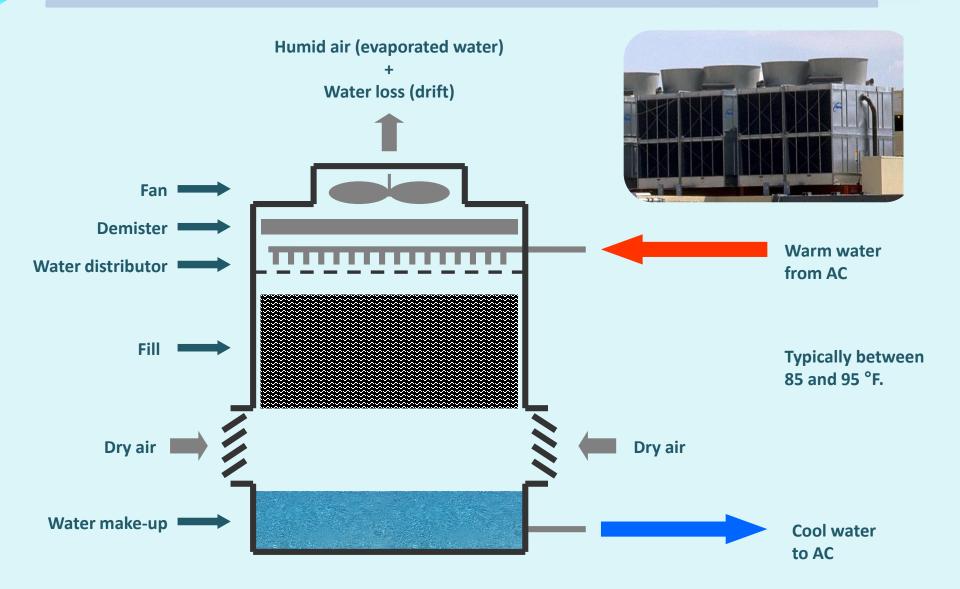


Step 2:





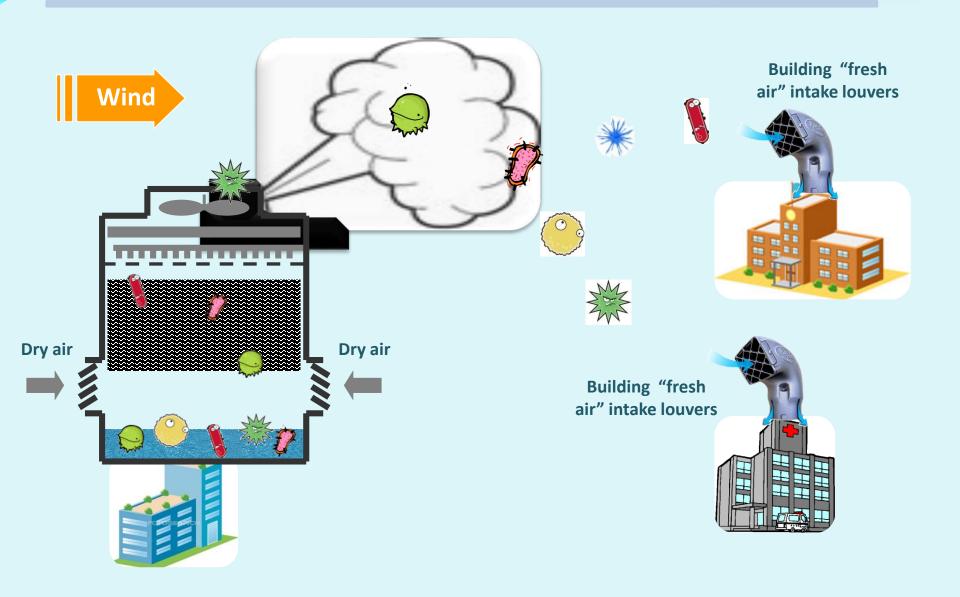
How it works (in a bio-clean world !)



🚯 Hydro-Technique

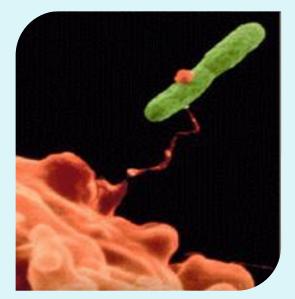
In the real "dirty" world...

🔥 Hydro-Technique



Legionella pneumophila



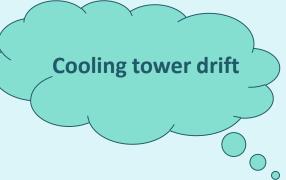


Simple definition:

An ubiquitous aquatic organism that causes Pontiac Fever and Legionnaires' disease (lung infection) if inhaled.

Thrives in temperatures between 77 and 122 °F.

Travels from infected water source through aerosolized water droplets.

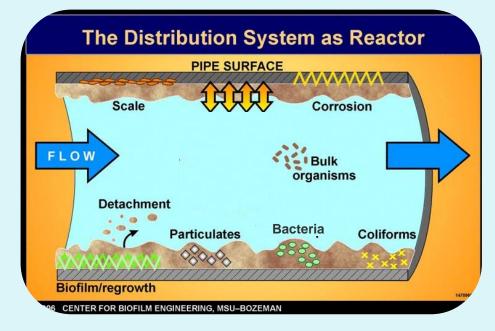


In the United States...

- 10,000 to 20,000 people get infected by legionella every year.
- Various studies have shown that some 40 to 60% of tested cooling towers contained Legionella.
- Legionnaires' disease mortality rate: 10 to 15% of those infected.

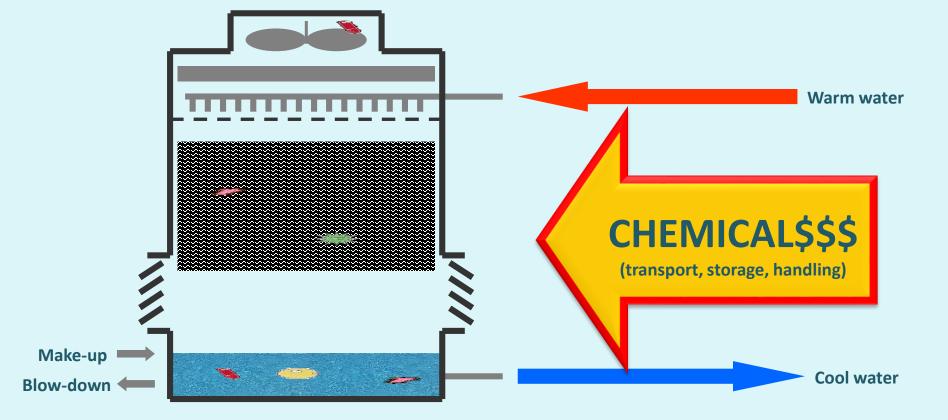






- Form on surfaces in aquatic systems.
- Often resistant to biocides.
- Monitoring is difficult.
- Release organisms into bulk fluid.
- Cost the US nation billions of dollars yearly in equipment damage, product contamination, energy losses and medical infections.

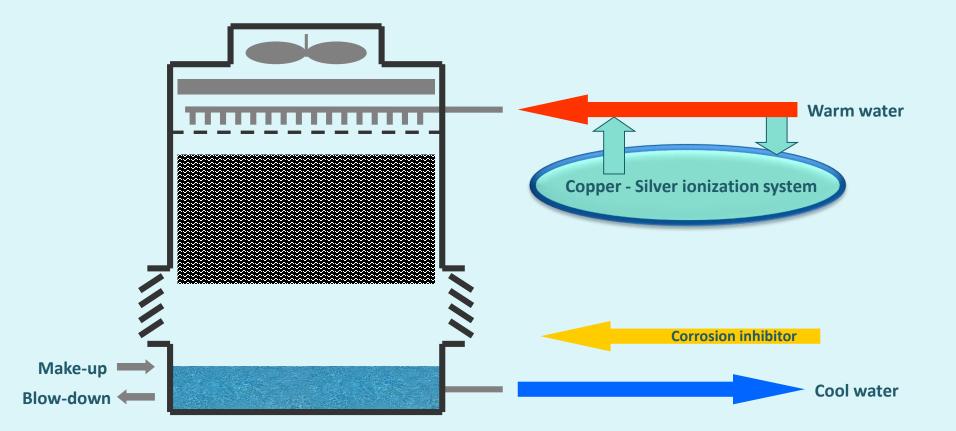










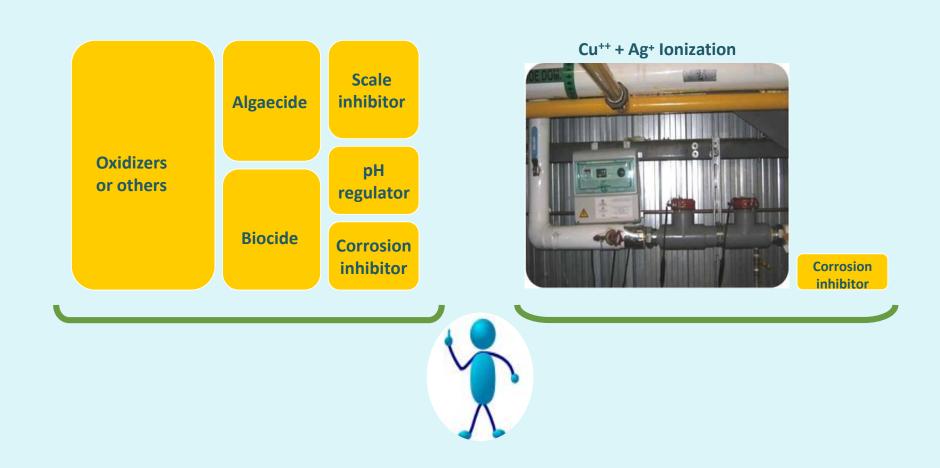


The Hydro-Techniques Inc alternative



Going from this:

To this:



Copper - Silver Ionization





Input: 110-240VAC 50/60Hz Output to electrodes: 0 to 42V

Copper - Silver Ionization



Copper A natural algaecide

Ex: copper cook ware

Silver A natural bacteria inhibitor

Ex: silver utensils

Providing adequate dosage of Cu⁺⁺ and Ag⁺ ions in water, results in 99.9999% (6 Log) kill rate.

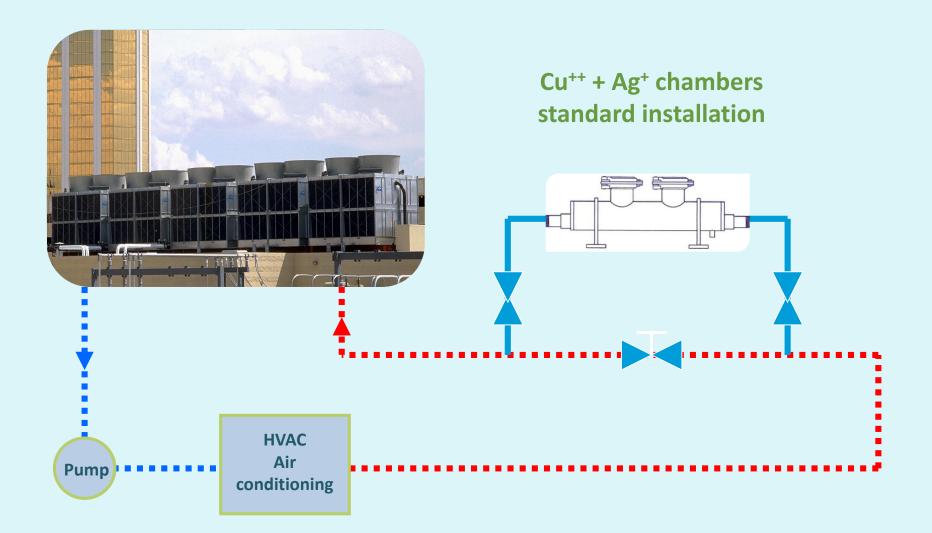
Copper + Silver disinfection is a natural proven method for elimination of water-borne pathogens and algae.



And others approve the use of Copper & Silver Ionization to control and prevent water infections.

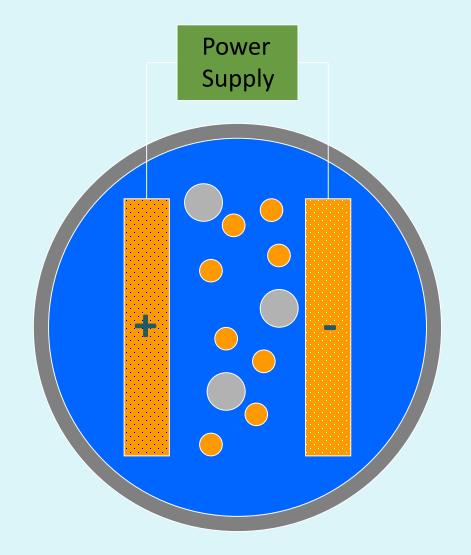
Installation





Copper - Silver Ionization





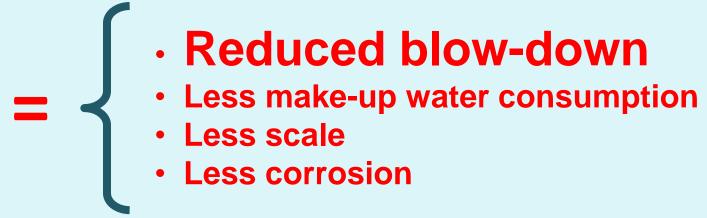
The ionization chamber contains sets of pairs of electrodes made from a calibrated copper-silver alloy.

A safe and low DC voltage is applied to the electrodes.

Water flows between the electrodes and picks up the Copper and Silver ions that are released everywhere in the water system.



And it doesn't stop there...



- Less corrosion

Operation settings



99.9999% disinfection requires:

0.4 ppm of Cu⁺⁺ ions to control algaes Traces of Ag⁺ ions to control bacterias



Step 1:

Step 2:

Measure the copper concentration in the water with the tester kit. As required, increase or decrease the ion production rate with the voltage knob. Silver concentration follows proportionally

Only 5 minutes, twice a week!!!

Maintenance



BioLustral International $Cu^{++} + Ag^+$ System uses a unique polarization inverting technology that minimizes the scale build-up on the electrodes and equalizes the electrodes' wear-out. Nevertheless, it is recommended that the electrodes be mechanically cleaned every two to four weeks.

Step 1:

Shut power off. Isolate unit using the bypass valves and open the hinge lock.

Step 2:

Brush and rinse each electrode plate with fresh water to remove scale Step 3:

Reinstall electrodes and restart.

15 minutes, every two to four weeks!!!

Typical life expectation of a set of electrodes: between 8 and 16 months.





- Powerful algaecide and bactericide
- Eliminates the Legionella and other bacterias & viruses
- Both curative and preventive action
- Penetrates the biofilm and acts directly at the stump
- Effective throughout the entire water system, not just on passing water

Benefits



- Not affected by temperature
- Non-corrosive
- Does not destabilize water pH
- Minimal maintenance
- Compact and easy to install

Benefits



Eliminates all chemicals except corrosion inhibitor

Hydro-Technique

- Reduces the build-up of scale and blow-down rate
- Eliminates the algae surface coating resulting in better heat transfer and lower energy cost
- Extends the lifespan of the cooling tower and coils system
- Generally pays for itself within 1 or 2 years
 maximum

Benefits

And a greener environment

- Less water consumption
- Substantially reduces airborne toxic chemical drift
- Substantially reduces the risks of incidents inherent to chemical transport and handling
- Eligible for Green, LEED and Toxic release inventory points







LEED points



Ionization devices on cooling towers have been shown to providing or contribute to provide LEED points in these categories:

Water efficiency : Cooling tower water management (1 point) (for existing building only)

Develop and implement a water management plan for the cooling tower that addresses chemical treatment, bleed-off, biological control and staff training as it relates to cooling tower maintenance.

Develop a water management strategy addressing treatment and bleed-off to ensure proper concentration levels in the cooling tower. Also, develop a program to avoid biological contamination and the risk of Legionella in the building.

Water Efficiency : Water use reduction (2 to 4 points)

To further increase water efficiency within buildings to reduce the burden on municipal water supply and wastewater systems. Requirements: employ strategies that in aggregate use less water than the water use baseline calculated for the building.

Innovation in design (1 to 2 points)

To provide design teams and projects the opportunity to achieve exceptional performance above the requirements set by the LEED Green Building Rating System and/or innovative performance in Green Building categories not specifically addressed.

Credit can be achieved through any combination of the Innovation in Design and Exemplary Performance paths. Substantially exceed a LEED 2009 for New Construction and Major Renovations performance credit such as energy performance or water efficiency.

Sizing

Function of...

Capacity

Cooling tower tonnage, flow-rate, total water volume, system operating pressure.

Operation

Daily blow-down, daily make-up, days in operation per year, use of other chemicals.

Hydro-Technique

Others

Location, feed water analysis, environmental conditions.

Always maintain 0.4 ppm Cu⁺⁺

Questions such as system operating pressure, piping material and diameter, filling material, etc., are also asked to the customer to make sure our product is fully compatible.

Publications



"Legionella are known to enter cooling tower systems in the make-up water. (...) Stagnant areas or dead legs may be difficult to clean or penetrate with biocides. (...) Cooling towers have been implicated in numerous outbreaks of Legionnaires' disease, and studies have shown that detectable levels of Legionella are present in many, if not most, such devices. (...) Metallic ions, namely copper and silver, effectively control microbial populations."

Minimizing the Risk of Legionellosis Associated with Building Water Systems, ASHRAE

"Copper-Silver Ionization distorts the permeability of the Legionella cell, denatures proteins, and leads to lysis and cell death. A commercial system can be easily installed to perform this ionization. Coppersilver ionization is less expensive than hyperchlorination and provides residual protection throughout the water distribution system."

Legionella: Human Health Criteria Document, Environmental Protection Agency (EPA)

"Copper-silver ionization can eradicate L. pneumofila (most virulent form of Legionella) in a water distribution system. The advantages of copper-silver ionization include relatively low cost, straightforward installation, easy maintenance, nontoxic by-products, and the presence of a disinfecting residual. (...) When the ionization unit was inactivated, water fixtures continued to be free of Legionella species for two additional months."

Departments of Medicine and Engineering, University of Pittsburgh



Thank you!

30A avenue du Pacifique Laval Qc.H7N 3X5 Téléphone 450 490 3821 www.Hydro-Techniques.com