

Evapco Engineering Flash



The Facts: Non-Chemical Water Treatment

Both chemical and non-chemical water treatment systems can be effective in treating open evaporative cooling water systems. Non-chemical, specifically pulsed-power technology, has a proven history of success in treating evaporative cooling water systems. Let us review some of the facts behind this technology!

FACT #1 – Effective Solution to Control Scale, Corrosion and Microbiological Growth

Pulsed-power technology controls the deposition of mineral scale (calcium carbonate) by creating “seed crystals” from small suspended particles in circulating cooling water. By cycling the water beyond normal solubility, the calcium carbonate precipitates onto these seed crystals, eventually settling in the basin as non-adherent powder.

This same technology controls biological growth by two physical mechanisms; agglomeration and electroporation. Agglomeration is the mechanism where “seed crystals” form with calcium carbonate and in the process trap bacteria and other small particles. These trapped bacteria cannot ingest food or reproduce and therefore become inert. Electroporation is the process of damaging the bacteria’s cell wall through high frequency pulsed electric fields generated by the treatment chamber.



Bacterial cell wall damaged by electroporation

Pulsed-power technology controls corrosion by operating the system in an alkaline environment beyond the normal saturation of calcium carbonate. Corrosion potential is further reduced by the elimination of oxidizing biocides and other potentially harmful chemicals being fed into the system.

FACT #2 – Environmentally Responsible Alternative Water Treatment Solution

Pulsed-power technology is chemical free, thus eliminating environmental and health concerns associated with liquid water treatment chemicals. In addition, the blowdown from an evaporative cooled water loop treated with pulsed-power technology can be reclaimed as gray water and recycled for other purposes. Remember, combining non-chemical water treatment with evaporative cooled equipment can contribute toward satisfying credit requirements for Water Efficiency and Innovation categories under the LEED® Green Building Rating System.

FACT #3 – Makeup Water Quality is Important

The quality of the makeup water supplied to the evaporative cooling system is very important to understand. Lab testing needs to be conducted prior to selecting **ANY** water treatment technology in an effort to prequalify the water, select materials of construction for cooling equipment and to provide the most efficient water treatment technology for the project.

Pulsed Electric Field Devices can be applied to a variety of water qualities around the world, however some water qualities can make the application of non-chemical treatment more challenging. Case in point, since non-chemical treatment systems utilize the naturally occurring calcium in the makeup water to control corrosion by natural cathodic protection, 100% softened makeup water is not appropriate.

Ultimately, non-chemical pulsed-power technology is proven and effective in treating a wide range of evaporative cooling applications and makeup waters. Remember these facts when specifying these safe, environmentally friendly non-chemical water treatment systems!

For more information on meeting your project specific water treatment needs, please contact your local EVAPCO Sales Representative!

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