



EET Water Systems

ENVIRONMENTAL ENERGY TECHNOLOGIES



Clean Water ideas that go Green

Electronic Cooling Tower Water Treatment —Saves Water and Energy

This Brochure describes an electronic equipment designed to minimize fouling associated with scale and microbial growth in Cooling Towers.

Our innovative non-chemical cooling tower water treatment system eliminates the use of chemicals for scale and bacteria control, reduces operating expenses and offers significant cost savings.

The unit is different from those in the market in that there is no need for a shut down during the installation. It also does not need special electrical outlets for power.

First installations started at Rochester Institute of Technology (RIT) about four years ago. Currently there are 16 installations at different buildings at RIT, including the Ice Rink, Student Activities Center.

RIT Facilities Management and Services has been very supportive of these installations as it makes their job of maintaining Towers easier without the worry of handling and using chemicals on Campus ground; **achieving a cleaner, safer, greener, and sustainable environment.**

TECHNOLOGY

Revolutionary Pulsing DC Voltage System Controls Cooling Tower Scale Buildup and Microbiological Organism Growth.

Patent Pending

HOW IT WORKS

The **Electronic Pulse Generator (EPG)** consists of three components; a coil typically wrapped around the pipe from the recirculating pump of the Tower, a terminal box, and a power supply box.

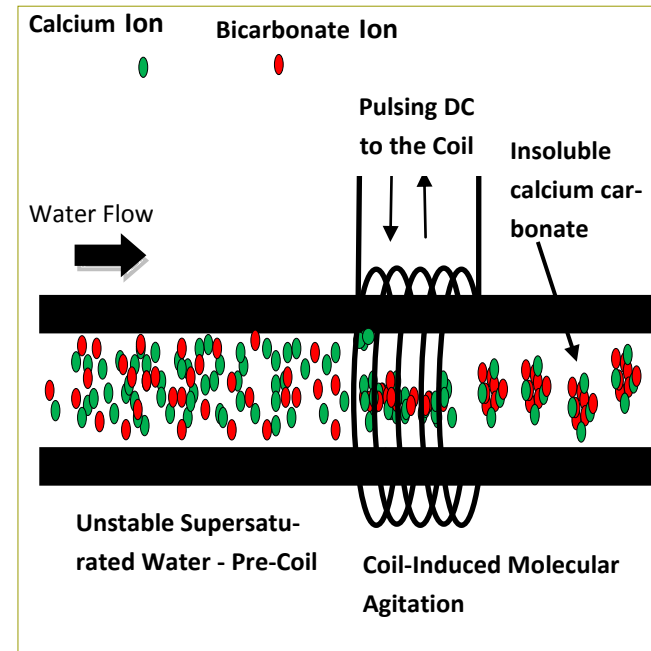
The power supply applies a pulsing DC voltage to energize a set of coils wrapped around the recirculation pipe to generate an intense electrical field in the water.

Microbial Control: The system provides a multitude of frequencies at varying and adjustable voltages and power levels that induce an intense electrical field. The most probable mechanism of biological kill is that the cell wall is disrupted causing eventual rupture. Industry acceptable standard for biological growth is 10,000 cfu/mL. Our historic count at RIT has been 100 cfu/mL, and less.

Control of scale and growth of microbiological organisms in the cooling tower water helps maintain system efficiency—A microbial film of 1/64" can cause up to a 30% increase in electrical demand.

HOW IT WORKS

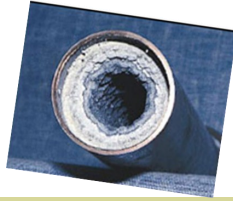
Scale Control: The coil is placed prior to the heat transfer surface(s) of the condenser. The energized coil inputs an inductive signal providing the activation energy that the saturated water needs to complete the reaction/combination of calcium and bicarbonate. Once this reaction takes place, the calcium carbonate cannot react again. A calcium carbonate powder is formed. This stable powder passes through the tower without adhering to the hot surface(s).



Corrosion Control: Water saturated with calcium and bicarbonate has almost no tendency to corrode. Keeping the system water at its calcium saturation point is essential for forming the powder. An added benefit of keeping the water saturated is minimized corrosion. Iron corrosion rates of less than 1 mill/year are common.

APPLICATIONS

- Cooling Towers
- Condensers
- Heat Exchangers

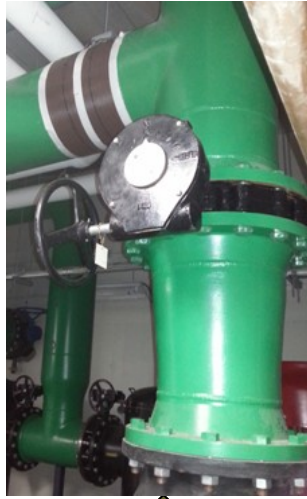


Advantages/Benefits:

**A Cleaner Safer Greener Sustainable
Work Space**

- Cost
- No modification to existing HVAC equipment
- Higher cycle of concentrations operation
- No chemicals required
 - *Eliminates hazardous material handling
 - * Eliminates exposure
 - * No liquids to spill
 - * No drum disposal issues
 - * Eliminates the need for a New York State 7G licensed commercial pesticide applicator
- Controls scale
- Controls microbiological organisms
- Low maintenance
- Monitoring time reduced
- Treated water can be used for flushing and irrigation purposes
- No Interruptions of services to existing equipment

EXAMPLES OF INSTALLATIONS



Pipe
Wrapped-
Coils



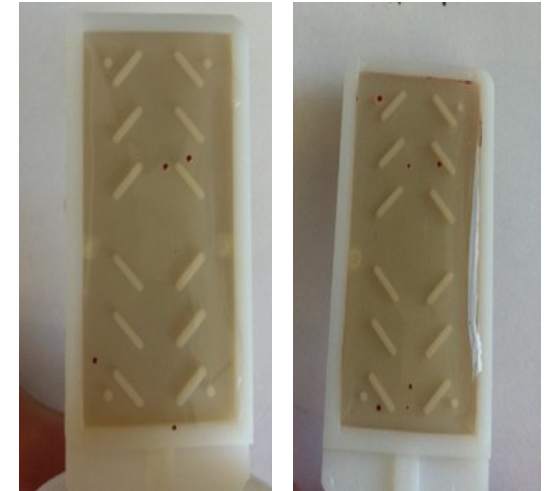
Skid-Based:
Direct
Interface with
Tower



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Sample Results:



$10^2 < 10^4$ Bacteria cfu/ml

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**A LOW COST SYSTEM FOR COOLING TOWER
WATER TREATMENT**