Improving the water quality of the cooling tower for refrigerators and heat sources

ECOION

To achieve IoT and SDGs,
New water quality management without any chemicals,
suitable for the coming era

The Ecoion makes agglomerates scale components in circulating water and drains them by an electrolytic reaction using unique electrodes.

Patent registered

Introducing mechanism with Video





Installation Image

By the Eocion, these issue will be solved

Water quality improvement and energy saving by preventing scale, slime and corrosion

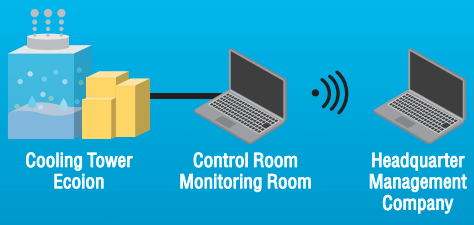
* The effect depends on the water quality

Improved in 3 weeks after introduction

<Calcium hardness> **35% reduction**

60% reduction <Ionic silica>

Remote monitoring of water quality to **reduce costs**



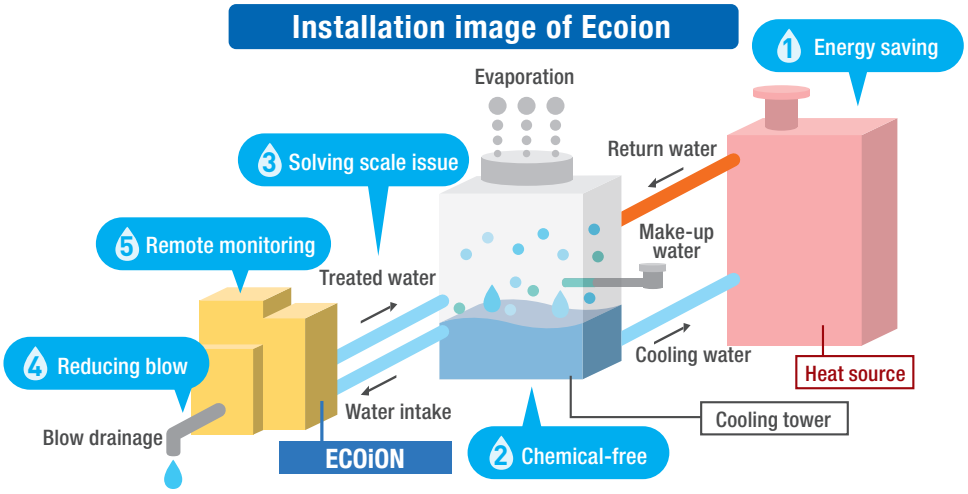
If you have the following issue with your cooling tower?

1. Wanted **the energy saving of refrigerators** and compressors
2. Wanted to cut the chemical costs, **works and maintenance** for water quality management.
3. Wanted to **solve the problems of scale, slime and corrosion from the ground up**
4. Blowing water to maintain quality, Wanted to reduce **the amount of water usage.**
5. Wanted to check the water quality **in real time**, and to reduce **access to the site**

Turn the leaflet for solution

ALPHA TECHNICAL RESEARCH CO.,LTD.

Installation image of Ecoion



Mechanism

Ecoion makes an electrolytic oxidation at the anode due to a special electrode, and metal ions and O_2 are generated. At the cathode, an electrolytic reduction occurs and H_2 is generated. It is a system that removes scale components in water

$$Ca^{++} + CO_3 \Rightarrow CaCO_3$$
(Calcium carbonate)

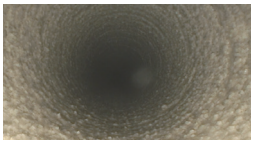
$$Mg^{++} + OH^- \Rightarrow Mg(OH)_2$$
(Magnesium hydroxide)

$$Si(OH)_3O^- + H^+ \Rightarrow (SiO_2)_n + (H_2O)_m$$
(Silica)

1 Achieve energy saving by reducing energy loss

Energy Saving for Industory and Innovation

By introducing Ecoion, the quality of circulating water can be improved and preserved. This reduces scale and slime and maintain in heat-exchanger efficiency. As a result, it also contributes to extending the life long of refrigerators and compressors



Inside the heat exchanger by the conventional management
Silica scale adheres and thermal efficiency decreases



Inside the heat exchanger after introducing Ecoion
Maintaining a healthy copper tube

2 No chemicals required! Enabling to control water quality without chemical injection

For Environment

Water quality was analyzed every month to change the amount and type of chemicals. With Ecoin, don't worry about chemicals replenishment, storage, or selection. Since chemicals are not mixed in the blow drainage, it can also contribute to global environmental conservation.

Comparison table Ecoion and Chemical

	Emission of silica and inorganic salts	Occurrence of scale	With or without maintenance	running cost
ECOiON	○ Aggregates and settles and automatically drains to the outside of the system	◎ No scale	○ It only takes about 3 years to replace the electrodes.	○ Electricity bill only
Conventional method (Chemical)	× The concentration will increase because it is forcibly dissolved.	× "If the dissolution limit is exceeded, scale will occur. Strong acid required for removal	× Chemicals should be infused once a month.	× Needs chemicals + electricity bill

3 It fundamentally solves the problems of scale, slime and corrosion.

Water Quality Improvement

It was limited to symptomatic treatment that dissolves scales and slimes attached by chemicals. Ecoion drains scale and slime out of the system and solves it from the ground up. *It is also possible to suppress the growth of bacteria. (* Option)

Effect of suppressing bacterial growth



Before introduction　After introduction

Effect of suppressing corrosion



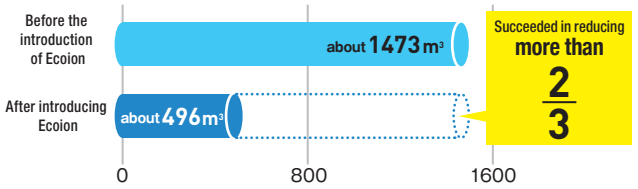
Before introduction　After introduction

4 Reduce water usage in the cooling tower

Water Saving

Blowing was performed so that the concentration factor was about 3 times. Howvwe, after the introduction of Ecoion, the amount of water used has been reduced by more than two-thirds in one year.

Changes in water usage (m³)



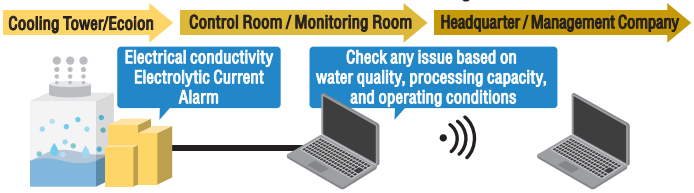
* The amount of reduction depends on the quality of make-up water and circulating water.

5 Enabling remote monitoring of water quality managemnet ※Option

IoT for cooling system

By measuring the daily electrical conductivity and electrolytic current value and transmitting them to the control room, etc., the water quality is notified in real time. With various alarms, it is possible to respond quickly even in the event of an abnormality. Measurement data can be accumulated, making it easier to plan changes such as load factors.

Overview of remote monitoring



Specification

Model number	ETS-300
Circulation water volume	200-300m³/h
Treated water volume	15-20L/Min
Power-supply voltage	Three-phase 200V

power consumption	Up to 600W
size	W 1,146×D 715×H 1,103mm
weight	90Kg
Operating weight	350Kg

■ Manufactured

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