



Energy • Environment • Sustainability



Electrochemical Scale Treatment

An Initiative of
ENSAVIOR

www.aquaire.in

AQUAIRE

Innovate • Restore • Engineer

In this age of globalization, the smarter and healthier buildings require high-performance engineering solutions.

Today, is the need for businesses to make a switch to best engineering practices & promote environmentally responsible products and services.



WHO WE ARE

Ensuring Quality, Retaining Trust

AQUAIRE is accepted with a vision to provide solutions related to world's most precious resource water. We at Aquaire; Innovate, Restore and engineer the water through its cycle specially in the area of filtration, Purification, Deaeration, Pressurisation, Make-up, and Thermal Storage for number of industries including construction, environmental, food and beverage, government, industrial, public utilities, residential and commercial building services.

We design, build and install the products and systems using cutting edge technologies based on scientific breakthroughs not only for improving energy efficiency and optimizing production but also promote sustainability and contribute to a green future.

Product Range

- ❖ Electrolytic Scale Removal System for Dissolved Salts
- ❖ Water Filtration System for Suspended Solids
- ❖ Pressure Maintaining System
- ❖ Deaeration System

- ❖ Water Make-up System
- ❖ Thermal Storage Systems
- ❖ Condenser Cleaning System (Automatic On-line Rubber Ball Cleaning)

We engage in the project right from the conceptualization stage and help in right selection, optimum design and implementation of most energy-efficient products. Besides that, we ensure on-site job training to project managers, facility managers and operators so that the systems are operated in most efficient and simplest manner. Based on the needs of the project, we also undertake the operation and maintenance of the system for which we have back up of spare parts and trained manpower.

Every project for us is a golden opportunity for continuous improvement and swift growth. This results in maximum cost effectiveness, efficiency, and productivity for our customers.



EST CAN TAKE CARE OF

- ❖ Scale Formation
- ❖ Algae Formation
- ❖ Slime Formation
- ❖ Waterborne Bacterial Growth
- ❖ Disinfection (Prevent Legionella)
- ❖ Alkaline pH Environment that Prevents Corrosion



Aquire introduces the Electrochemical Scale Treatment (EST) system, that helps remove scale by electrolytic operation without adding chemicals (Zero Chemical).

Open and closed loop water circuits encounter three main problems – **Scale, Corrosion, Bio-fouling and Algae**

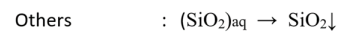
The following operational issues arise from these problems:

- ❖ Increase in electricity consumption
- ❖ Increase of water consumption
- ❖ Reduced efficiency of the cooling tower
- ❖ Health hazards
- ❖ Shorter life of equipment

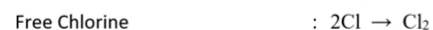
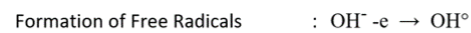
Technical & Chemical Process

- ❖ By applying electrical power between the anode and the cathode, a chemical reaction is activated, and electrolysis process takes place. Water from the cooling tower basin is circulated through the electrolytic scale remover reactor.
- ❖ Due to the electrolysis process, the dissolved calcium molecules get deposited on the cathode and the water returns to the process.

- ❖ The chemical reaction on ESR cathode is as shown:

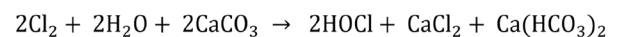


- ❖ The chemical reaction on ESR anode is as shown:



- ❖ The main ingredients of scale in water ($MgCO_3$, $CaCO_3$, $Mg(OH)_2$, SiO_2) are almost completely removed from the water.

- ❖ Chlorine in water forms hypochlorous acid (HOCl) and hydrochloric acid (HCL). When HOCl and HCL reacts for a sufficient time with limestone (calcium carbonate) the reaction is:



- ❖ Calcium chloride and carbon dioxide solubility are rather high, so these reactions of HOCl and HCl would tend to decompose calcium carbonate scale to form rather soluble calcium chloride.

- ❖ Oxidants generated mitigate Corrosion, Bio-fouling, Micro Organism growth, Scaling and spread of Bacteria.

Potential Benefits of Electrochemical Scale Treatment System

- ❖ Design performance parameters are sustained of the equipments in the water loop,
- ❖ Increase in heat transfer efficiency of Cooling Towers, Chillers, Heat Exchangers etc. in the water loop,
- ❖ 100% savings on chemicals,
- ❖ No need of softeners,
- ❖ Savings on blow-down water,
- ❖ Savings on maintenance labor cost,
- ❖ Water savings,
- ❖ Energy/Power savings of cooling fan,
- ❖ Energy savings on cooling energy.

Effect in Condenser

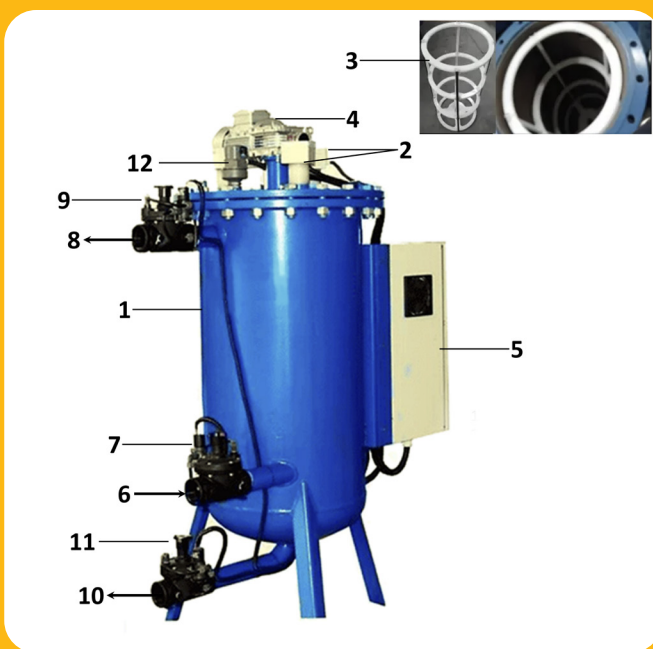
The photograph shows the conditions of heat exchanger tubes before and after installation of Electrochemical Scale Treatment system. Previously (top photo), scale had built-up so much that heat exchanger tubes were blocked, but after installation and operation (bottom photo), the adhesion status has significantly improved.



Before Installation of EST



After 6 Months of Installation of EST



Key Components of Electrochemical Scale Treatment System (EST)

1. Reaction Tank
2. Electrodes
3. Scrapper (see the Inset picture)
4. Scrapper Motor
5. Control Panel
6. Inlet Connection
7. Inlet Valve
8. Outlet Connection
9. Outlet Valve
10. Drain Outlet
11. Drain Valve
12. Air Release/Intake Valve



Ensavior Technologies Pvt. Ltd



+91- 9658 373 373
+91- 11- 47350382



Plot No. 17A, Block A, Sector 19, Dwarka,
New Delhi-110075, INDIA



info@ensavior.com
www.ensavior.com

Branch Offices: Bengaluru | Kolkata | Mumbai | Singapore

CIN: U72900DL2011PTC222724