



METSI ENVIRO TECH PVT LTD
Innovative Technological Environmental Solutions



**ENVIRONMENTAL
SUSTAINABILITY**

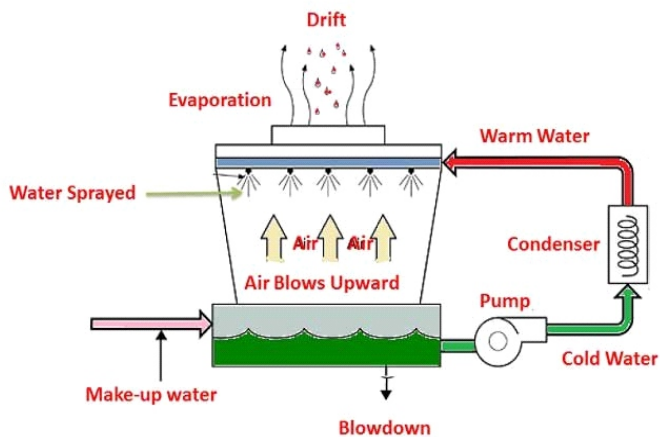
WATER BATTERY

CLAIRE FONTAINE®

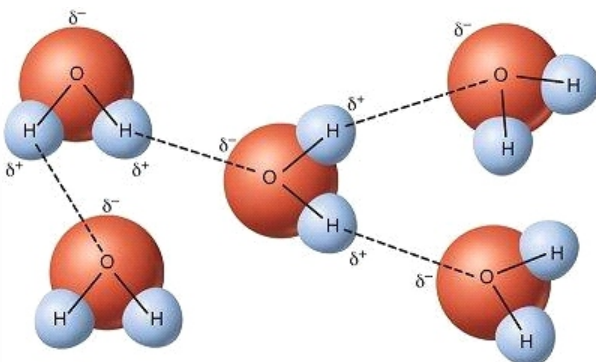
Advanced Electrolyt - ionic Technology

**NON HAZARDOUS
LIQUID
FOR COOLING TOWER**

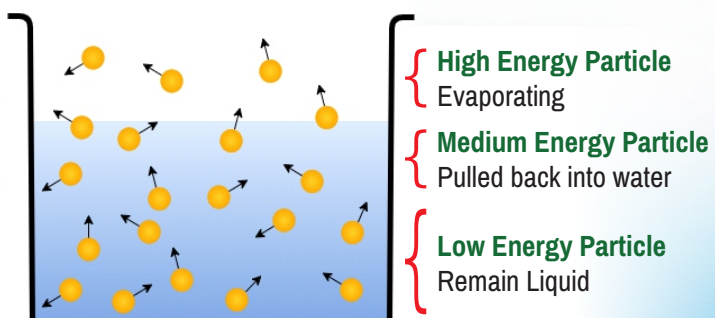
A Typical Cooling Tower



Hydrogen Bonding of Water



Evaporation Causes Cooling



Problems In Cooling Tower



SCALE



CORROSION



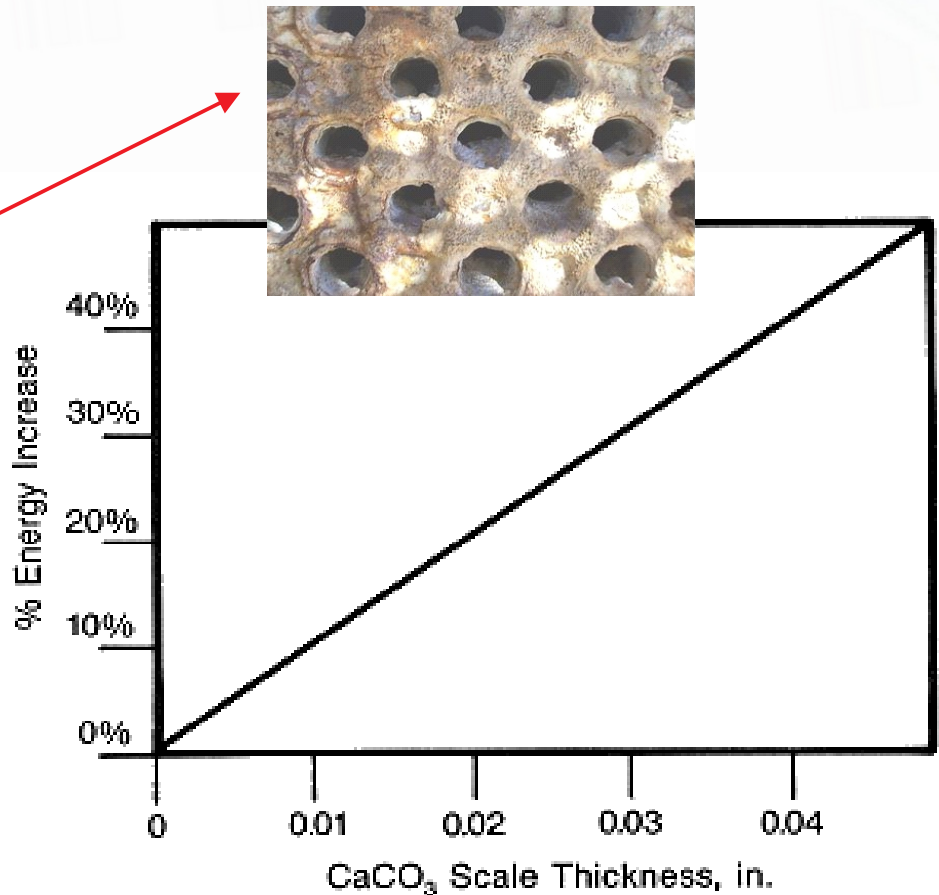
**MICROBIAL GROWTH /
GENERAL FOULING**



SUSPENDED SOLIDS

How Does Condenser Scaling impact your Energy Consumption?

Scaled heat exchangers increase energy consumption & operating costs.



Factors Affecting Scaling

Temperature ↑
pH & Alkalinity ↑
Conc. of Scale Forming Salts ↑
Suspended Solids ↑

How To Control Scale ?

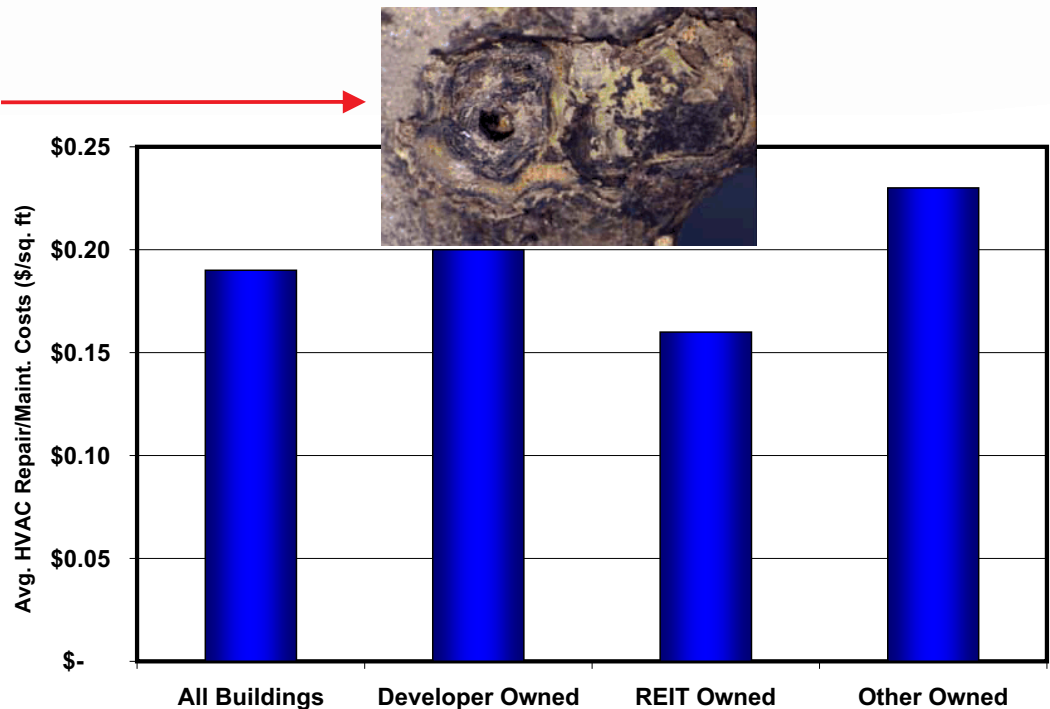
- Limit The Concentrations of Minerals
- Use Corrosive Acids & Chemicals
- Use Safe Eco Friendly

Corrosion

A natural process converting processed metals to their native state.

How does Condenser Corrosion impact your Maintenance Costs

Corrosion failures are expensive and inconvenient!



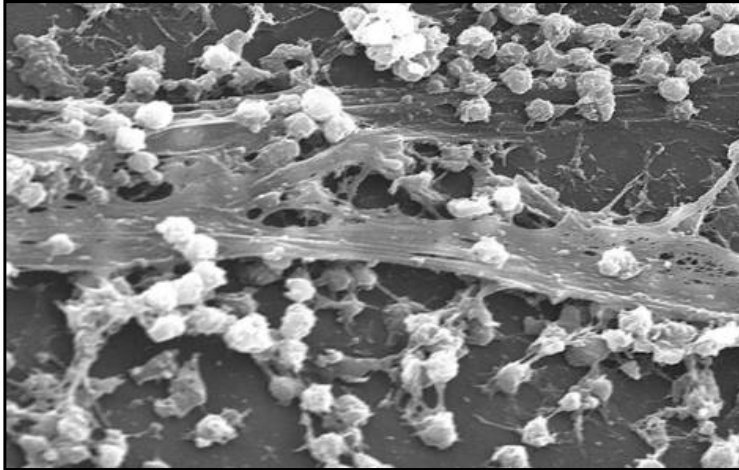
Factors Affecting Corrosion

↑	
Dissolved Gases	
Scale Deposits	
Suspended Matter	
Microorganisms	
Temperature	↑↓
Heat Transfer	
Dissimilar Metals	
	pH
	Dissolved Solids
	Velocity

How To Control Corrosion?

- Use Corrosion-resistant Materials
- Apply Inert Barriers/Films
- Use Sacrificial Anodes
- Apply Corrosion Inhibitors
- Adjust Water Chemistry with

Fouling



- Loose, non adherent deposits made up of insoluble particulate present in the make up water.
- Introduced to the cooling system by process leaks, wind or microbiological growth.
- Proliferation of microorganisms, which can directly or indirectly reduce the performance of Cooling system.

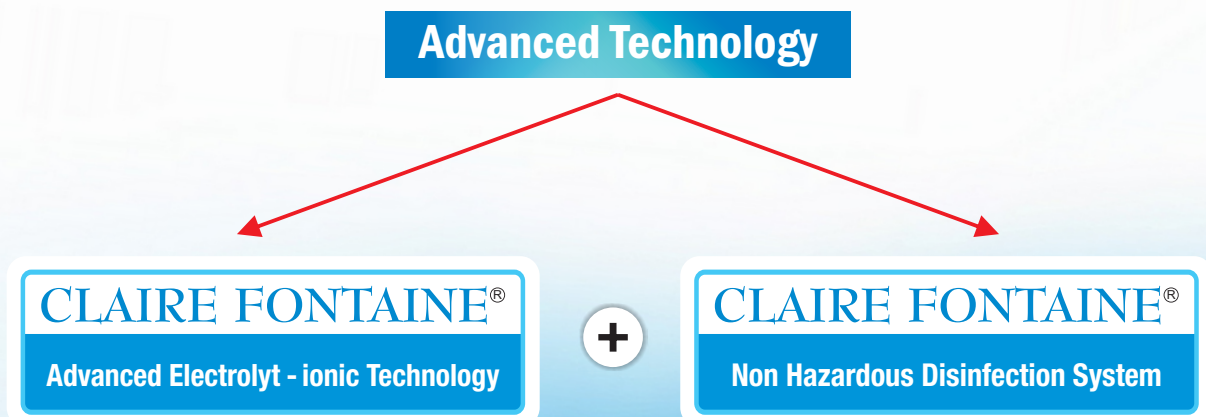
Biofilm adversely affects Thermal Conductivity

Sl. No.	Material	Thermal Conductivity (BTU/ft2h °F in)
1	Clean Carbon Steel	310
2	Analcite Deposit	8.8
3	Calcium Phosphate Deposit	25
4	Calcium Sulphate Deposit	16

5	Magnesium Phosphate	15
6	Magnesium Iron Oxide	20
7	Silicate Scale (Porous)	0.6
8	Fire Brick	7
9	Insulating Brick	0.7
10	Bio-Film	0.4

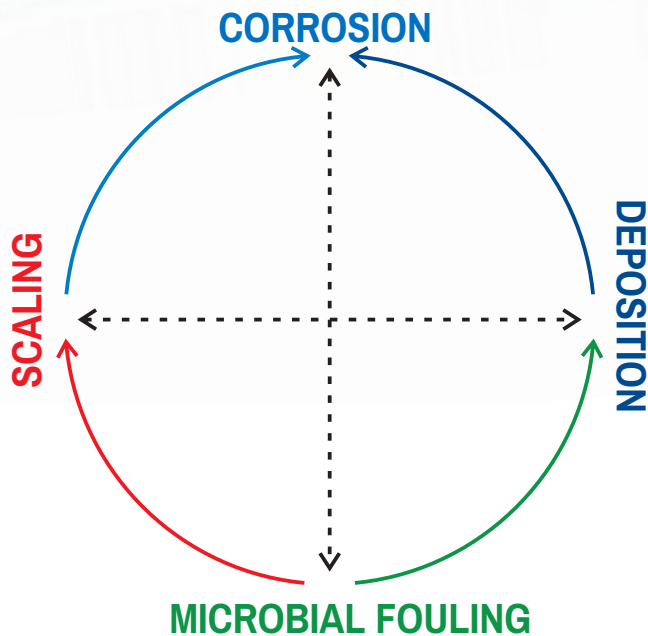
How To Control Microbiological Problem

Traditionally - Adding oxidizing & non-oxidizing biocides.



(Advanced Electrolyt-ionic Technology will generate oxidants without need for hazardous chemicals)

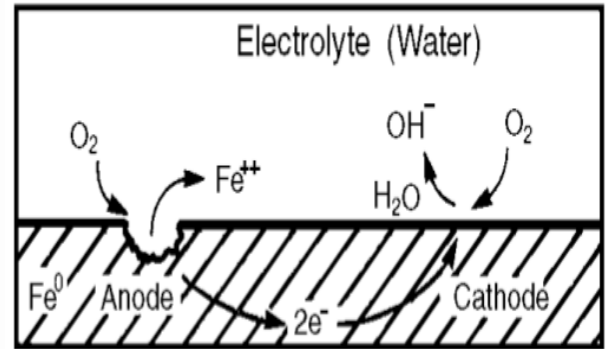
Problem Cycle in Cooling Water System



Technology

- Scale Control
- Corrosion Control

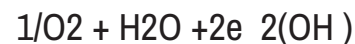
Corrosion Mechanism



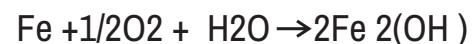
Anode Reaction:



Cathode Reaction:



These can be summed to give the overall oxidation reduction reaction



For microbial growth, disinfection protocol is followed for recirculation.

Eliminates Scaling

Removes temporary hardness (CaCO_3 , MgCO_3), prevents scale buildup and ensures optimal heat transfer with lower maintenance costs.

Control Corrosion

Maintains high pH and balanced water chemistry, Minimizes corrosion risks without over-softening the water.

Biofilm Control

Generates powerful free radicals. Provides support for removal of biofilms, algae, and bacteria.

Targets Pathogens

Actively destroys harmful microbes like Legionella, enhancing cooling tower safety and water quality.

Schematic

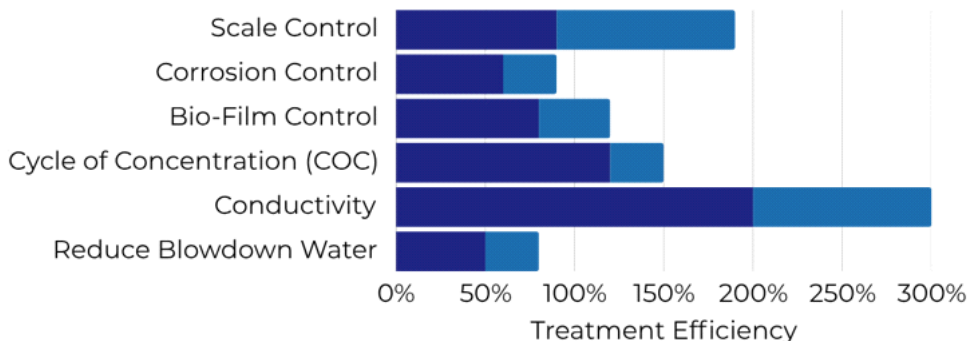


Structure

1	Reactor
2	Control Panel
3	System Inlet
4	System Outlet
5	Feed Pump
6	TDS Sensor
7	pH Sensor
8	ORP Sensor
9	Disc Filter Cartridge
10	Self Cleaning System

Comparison of Efficiency

● Treatment Efficiency (Min.) ● Treatment Efficiency (Max.)



50% Blowdown Reduction

2X. Higher COC

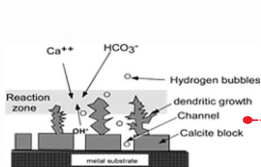
50% Scaling Reduction

30% Better Heat transfer

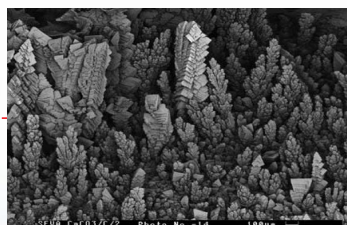
20% Energy Efficient

NIL. No Chemical

Crystal Orientation



Schematic of a Crystal orientation

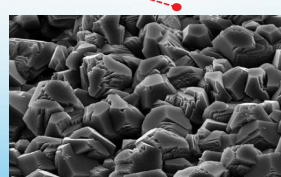


Crystal orientation: Dendritic growth of a thick hardness layer.

Lower face of, showing channels between the crystal blocks.

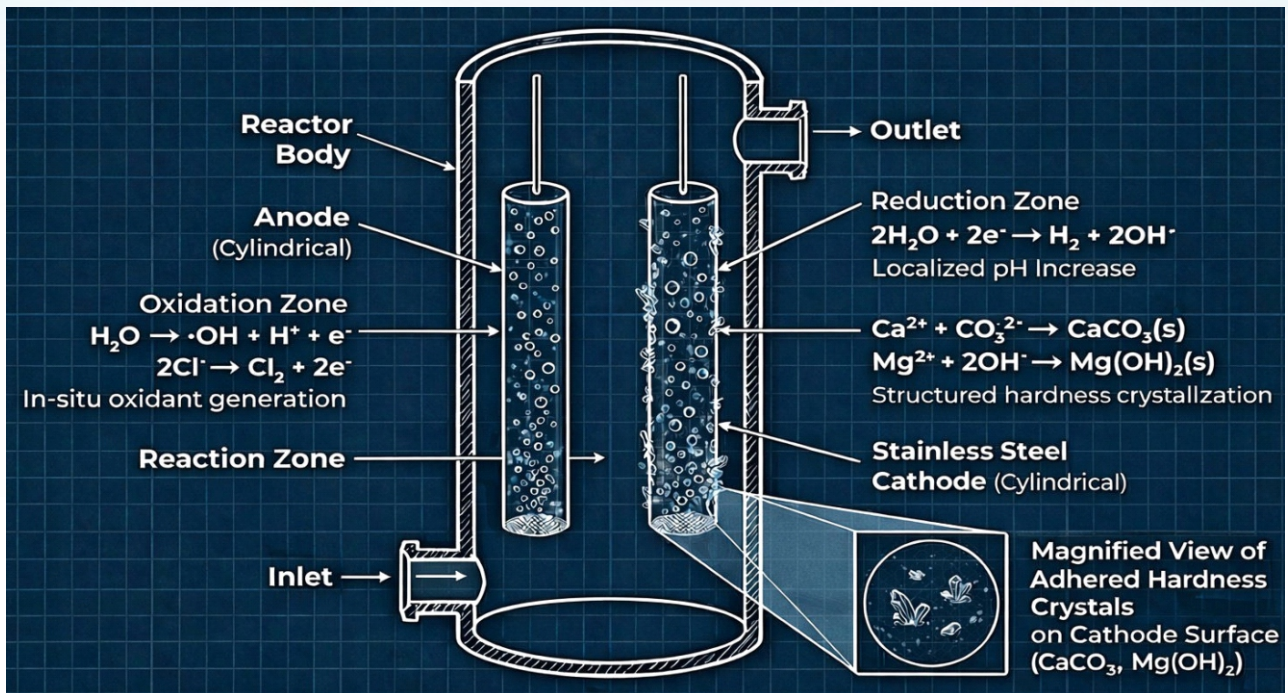


Upper face showing pure hardness crystal



- Power module alters voltage to ensure that dendritic removal is automated via physical surface cleaning of the electrodes.
- Combination of specialized metals for cathode & anode ensures consistency in passing of current & voltage. From the electrodes.

Reactor Process



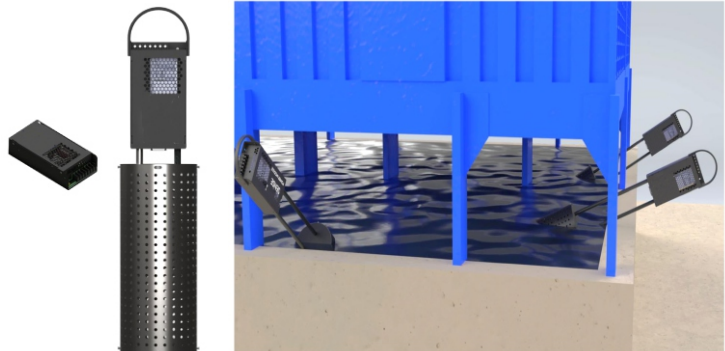
Models

Manual Model

Manual measurement of ORP, Ph, TDS.

Manual cleaning of electrode based on dentritic build up

Upto 700 TR



Automated Model

Online measurement of ORP, Ph, TDS.

Automated cleaning of electrode based on dentritic build up

Above 300 TR.

Customized.

