ELGRESSY
ENGINEERING SERVICES LTD.

# E.S.T SYSTEM

## Cooling Tower Water Treatment

## E.S.T - Electrochemical Scale Treatment System for cooling towers

### Addressing Cooling Towers Problems

Where there is a need for cooling water, four factors cause concern for engineers and plant management: Corrosion, Scale, Bio-fouling and Algae
Together, they cause major problems including:

- Health hazards
- Increased electricity and water consumption
- Reduction in cooling efficiency
- Reduced equipment life expectancy

Until now, the common method of treatment for these problems entailed the use of chemicals which are expensive, environmentally unfriendly and don't guarantee results.

## E.S.T Provides the Right Solution

State of the Art System

The Electrochemical Scale Treatment System (E.S.T) is a state of the art, patented system which prevents scaling, alga and corrosion.

Electrochemical Process

Using a unique electrochemical process, the E.S.T system actively, efficiently and cost effectively deals with the problems associated with cooling water systems without using harmful chemicals.

## E.S.T - One System, Many Benefits

Multiple solutions and benefits in one system:

Save up to 60% on operational costs:

- savings on chemicals
- decrease in water usage
- lower energy costs
- reduction in labor costs

Green Technology

- No chemical feeds or discharge
- Water can be recycled and reused for irrigation

Scale and Corrosion Control

- All precipitation of salts occurs in the reaction chamber
- No scale in the system heat exchangers
- Control over corrosion potential due to low aggression of water

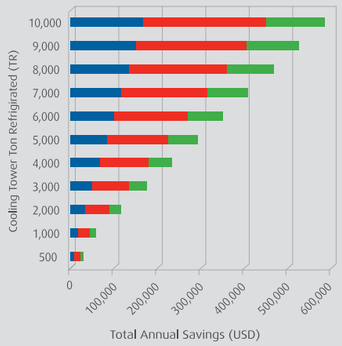
Longer system lifespan

- Cooling system works better and longer

Full control and supervision

- Performance is monitored with complete control of all parameters

Cooling Tower Saving Calculation




Annual savings - water (USD)

Annual savings - reuse of water for irrigation (USD)

Annual savings - chemicals (USD)

Basic assumptions:

- Savings calculation is based on actual case stusies done by Elgressy Engineering Ltd.
- Chemicals cost: 0.3$/m³ (make up water)
- Water cost = 1.5$/m³ (including sewage disposal costs)
- Tower operation: 2000 hrs/yr.

## E.S.T Installations (partial list)

HONDA · TOYOTA · Hilton · Sheraton HOTELS & RESORTS
intel · posco · PLASSON · AZRIELI GROUP
Ford · Club Med · Mercedes-Benz

## E.S.T – The Electrochemical Process

The E.S.T System is connected to the cooling system or the cooling tower externally so no intervention in the system is needed. This significantly reduces installation costs and time. A reaction tank, with electrodes (anodes) installed inside, acts as a cathode.

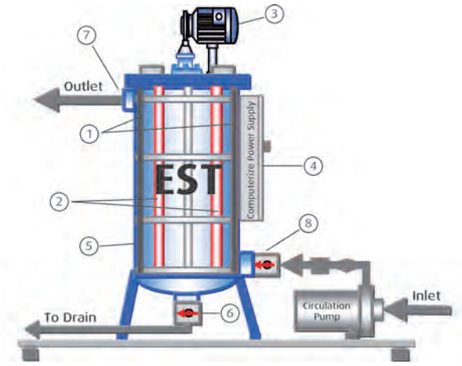
The reaction tank is connected to the cooling tower via a circulation pump, and the water is circulated from the cooling tower basin to the reaction tank and back to the cooling tower.

The anodes installed in the tank are constructed from titanium coated with nickel oxide, an exclusive Elgressy patent.
DC current passes from the cathode, through the electrolyte (water) in the reaction tank, to the anodes and produces OH ^- ions, which causes a rise in the pH level near the reaction tank walls. This causes scale to precipitate on the tank walls.
The scale that accumulates on the walls of the reaction tank is extracted by a scraper which is controlled by a pump.

OH+ ions that remain near the anodes cause a decrease of pH levels and produce oxidants which disinfect the water.

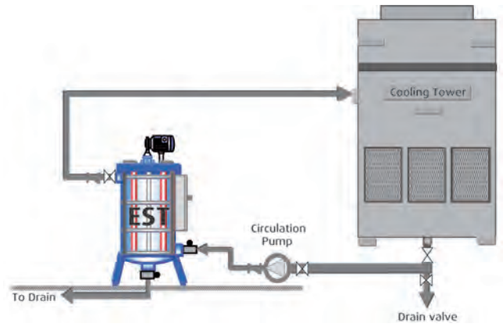
Maintenance and control of the E.S.T system is performed on site with constant access to all figurers and parameters relating to water quality and system performance online. The Elgressy support team is available to provide on-line support and solutions.

creates an environment that prevents the development of harmful micro-organisms.




1. Scraper
2. Electrodes
3. Scraper Motor
4. Power Supply
5. Reaction Tank
6. Drain valve
7. Inlet valve (optional)

External connection of the EST system to the cooling tower

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## Elgressy Engineering Services

Elgressy Engineering Services Ltd. has been active in the field of water treatment for over 37 years and has thousands systems installed worldwide.

Elgressy develops and markets comprehensive solutions and systems for the treatment and prevention of common water related problems including: scale, bacteria and corrosion. Elgressy also provides solutions for the reclamation of water with high concentrations of organic matter, waste water and effluent reuse.

The Elgressy team consists of highly experienced professionals with many years experience in engineering and the industry.

Through our distribution and client network we continuously monitor the market and if necessary update or develop new solutions to meet the changing needs of the industrial water treatment sector.

Daybreak Technologies
Daybreak Technomech
Daybreak Overseas


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