



ELGRESSY
ENGINEERING SERVICES LTD.



E.S.T SYSTEM

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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, prevents bio fouling, microorganism growth, inhibits corrosion, produces oxidants in the water and prevents the spread of airborne bacteria.

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:

- ▶ 100% savings on chemicals
- ▶ 20% - 40% decrease in water usage
- ▶ 5% - 15% lower energy costs
- ▶ 10% - 50% 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

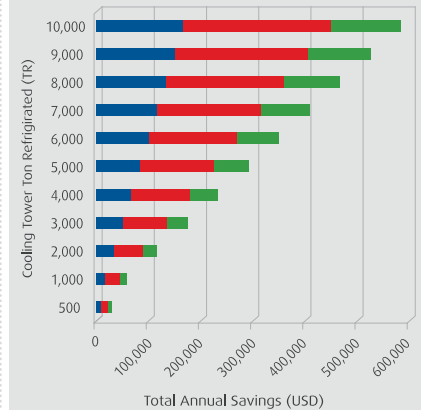
- Cooling system works better and longer

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 studies 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)



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 chamber with electrodes (anodes) installed inside acts as a cathode.

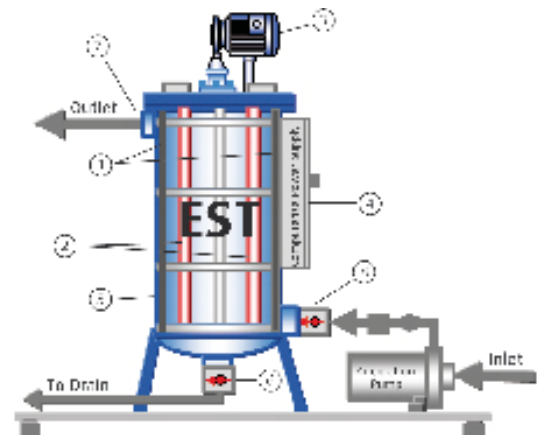
The reaction tank is connected to the cooling tower via a circulation pump, and the water is circulated from the cooling tower basin to the reaction tank and back to the cooling tower.

Tank anodes are constructed from nickel oxide coated titanium, 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 pH near the reaction tank walls. This causes scale to sink to the bottom of the tank, produces corrosion preventing copper and iron ions and creates an environment that prevents the development of harmful micro-organisms. Scale that accumulates on the bottom of the reaction tank is extracted by a pump.

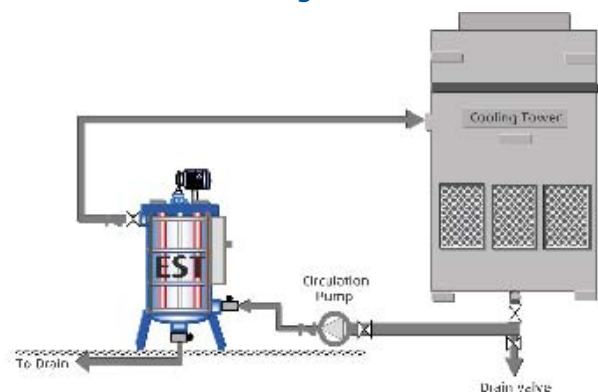
OH⁻ ions that remain near the anodes cause a decrease of pH levels and produce oxidants which disinfect the water.

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



1. Scraper
2. Electrodes
3. Scraper Motor
4. Power Supply
5. Reaction Tank
6. Drain valve
7. Outlet valve
8. Inlet valve

External connection of the EST system to the cooling tower



Elgressy Engineering Services

Elgressy Engineering Services Ltd. has been active in the field of water treatment for over 30 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.

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Elgressy Engineering Services Ltd. is a subsidiary of Clean Technologies Group (CTG).

CTG is an international Cleantech company providing best-of-breed environmental solutions to industrial and municipal clients worldwide.

CTG delivers state-of-the-art solutions for water, wastewater and solid waste management.



Clean Technologies Group Ltd.

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Design: Studio Perach