

Chemical Free Cooling Tower Water Treatment

GLJM Diversified Sales and Services Corp.

Our Company

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GLJM Diversified Sales and Services Corp. was established in 2007 basically as a retailer/wholesaler of personal protective equipment and through the years have added various product in its list of world famous brand.

As our client grew in number, so was our product and services. Our long term commitment to our client have earned us their trust and confidence, and due to a lot of our client's inquiry of a reliable source of tailor fit company uniforms we decided to manufacture it and we now co-own a facility in Sto Tomas, Batangas where we manufacture our company uniforms and have since supplied satisfied customers across the nation.



We operate based on traditional business model wherein our client's need comes first, and we have prided ourselves with world class products equalled with our firm commitment in providing excellent service as well. New products are added every year in order to give our valued client a wider range to choose from.

Our product and services :

- ✓ Personal Safety Equipment
- ✓ Health, Medical & Pharmaceutical
- ✓ Environmental Monitors
- ✓ Large format printing and Signage
- ✓ Alcohol Breath Analyzer
- ✓ Industrial Supplies
- ✓ Fire Fighting Equipment
- ✓ Cooling Tower and Waste Water Treatment



INTRODUCING

State of the Art System

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

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.



Elgressy Engineering Services Ltd. has been active in the field of water treatment for over 30 years and has a reputation for innovation, quality and service second to none.

Elgressy develops and markets comprehensive solutions and systems for the treatment and prevention of common water related problems including: scale, bacteria and corrosion.

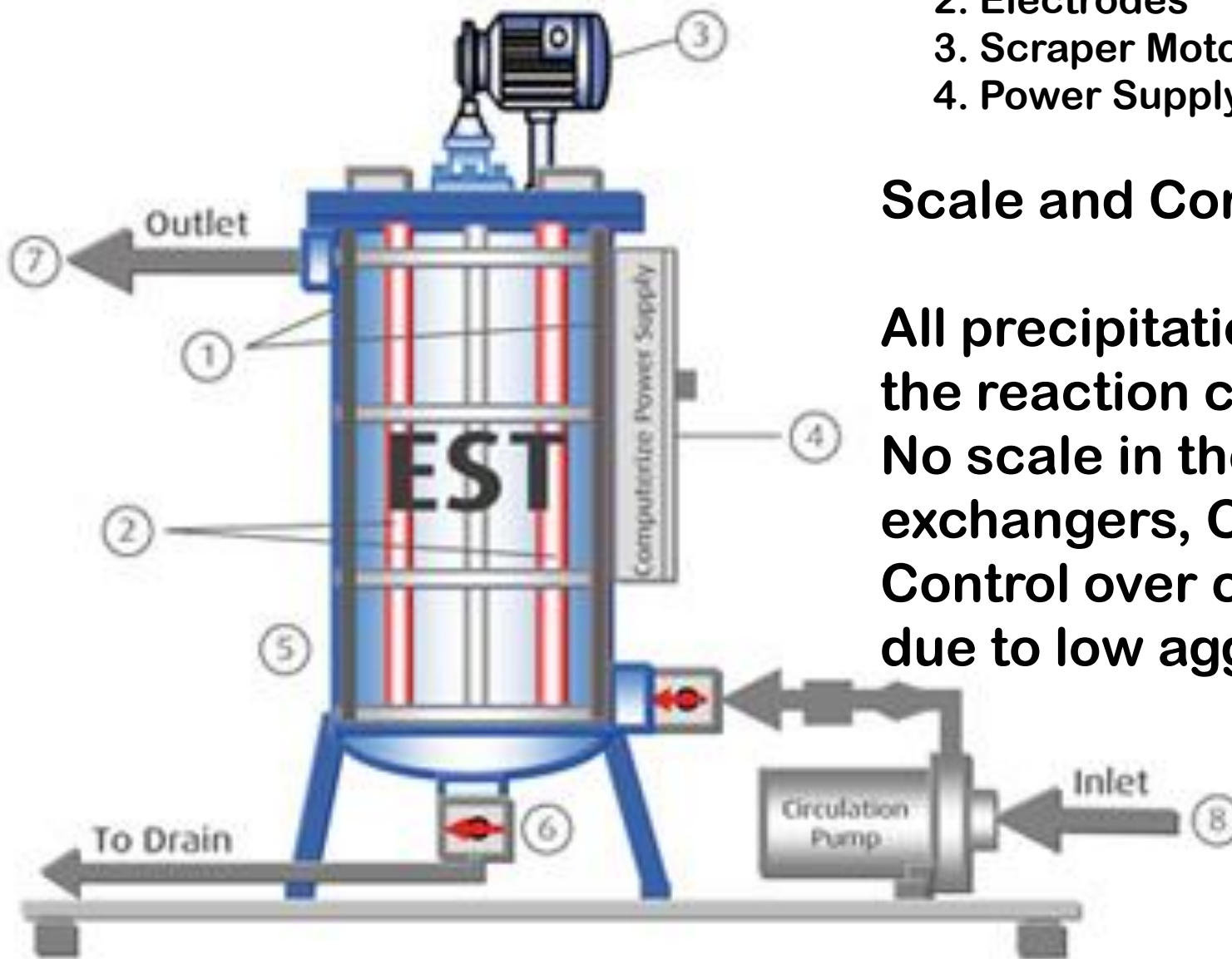


The most prevalent method for commercial cooling is water cooling. The warm water is re-circulated between a heat exchanger and a cooling tower and back again. The continuous use of this water creates several problems. First, the water is corrosive to steel and copper system components. Second, the warm re-circulating water promotes the growth of harmful bacteria. Third, evaporation of water in the cooling tower increases the concentration of natural minerals which can deposit as scale on critical system components. Fresh water is added to the system to replace the evaporated volume and this process of evaporation and replenishment increases the mineral concentration several times.



Traditionally hazardous chemicals are added to the cooling water to inhibit corrosion of system components, to retard mineral scaling, and to limit bacteria growth. Most U.S. cooling towers use this method which in total, discharges millions of pounds of hazardous chemicals back into waste treatment plants that are not designed to remove them before the water is discharged into our waterways. This provides incentive to move away from the chemical treatment to chemical-free treatment.



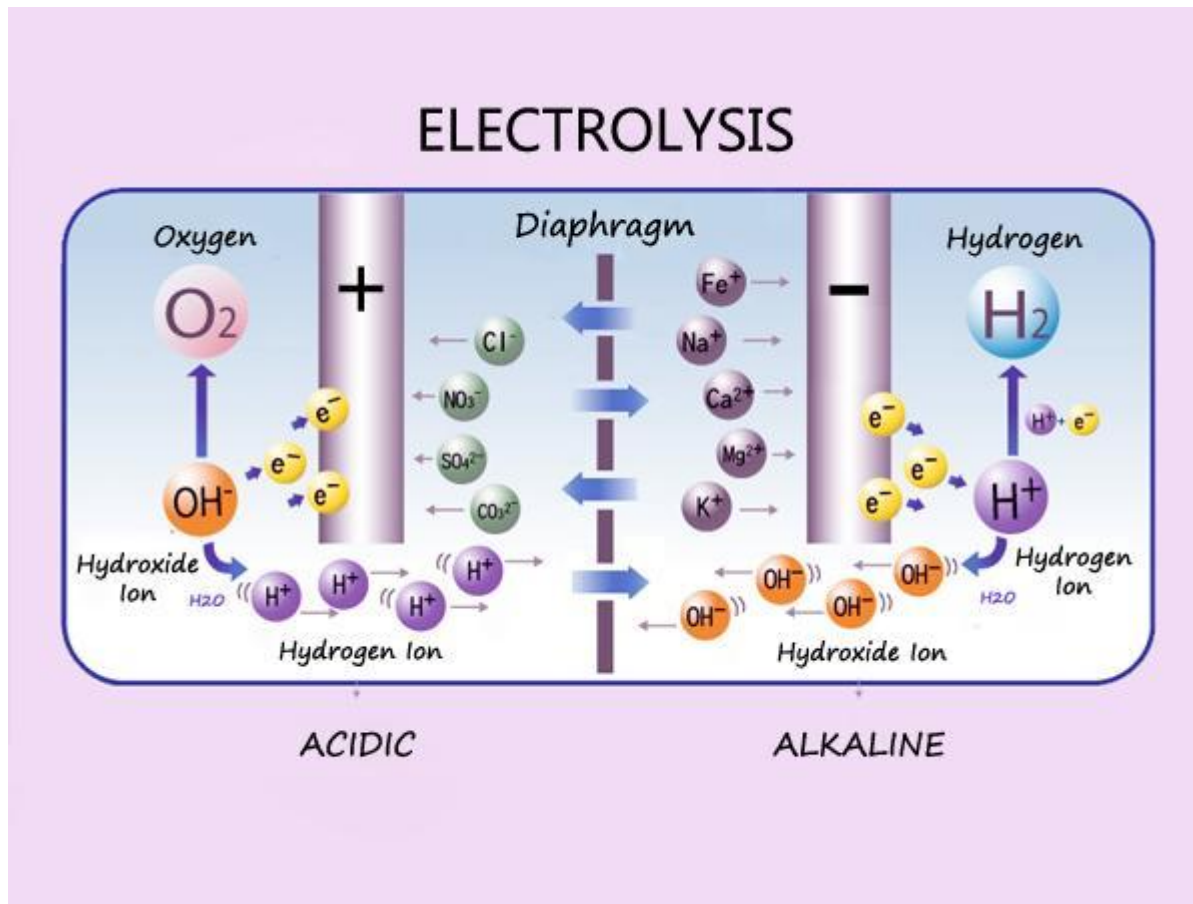


Scale and Corrosion Control :

All precipitation of salts occurs in the reaction chamber

No scale in the system, heat exchangers, CHILLERS & PIPES
Control over corrosion potential due to low aggression of water

- The Elgressy EST operates most efficiently in the range Total Alkalinity 260 – 340ppm
- Electrolysis will be used to force calcium precipitation in the EST reaction chamber as desired.



The calcium levels will decrease slightly with increased water temperature but the Alkalinity varies substantially. It is the ions produced at the anode by electrolysis in the EST that provides the alkalinity. Total Alkalinity within the following range will usually accomplish this.

Corrosion Prevention

When the system water exceeds the saturation point (supersaturated), it will tend to create a mono layer of oxide protection on the surface of cooling system components as a protection against corrosion. The prevention of scale deposits also eliminates the sites for potential under deposit corrosion. Here the Langelier Saturation Index (LSI) comes into play. It requires manual calculation of pH, TDS, Calcium and Alkalinity, all at a constant temperature. $LSI=0$ when the solution is at equilibrium...no more calcium can be maintained in solution.



The Elgressy EST operates most efficiently in the supersaturated range $LSI = 1.4 - 1.9$.

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Home / Calculators / Langelier Index calculator

Langelier Saturation Index Calculator

This calculator helps you determine the scaling potential of the water by using the Langelier Saturation Index.

Give the values of your water analysis. All the fields with * are required.

Table 1: Input table	
pH	
Conductivity / TDS	mg/L
[Ca ²⁺]	mg/L
[HCO ₃]	mg/L
Water temperature	degree C

If you do not have a water analysis you can use the values in table 2. Click on a button at the bottom of table 2

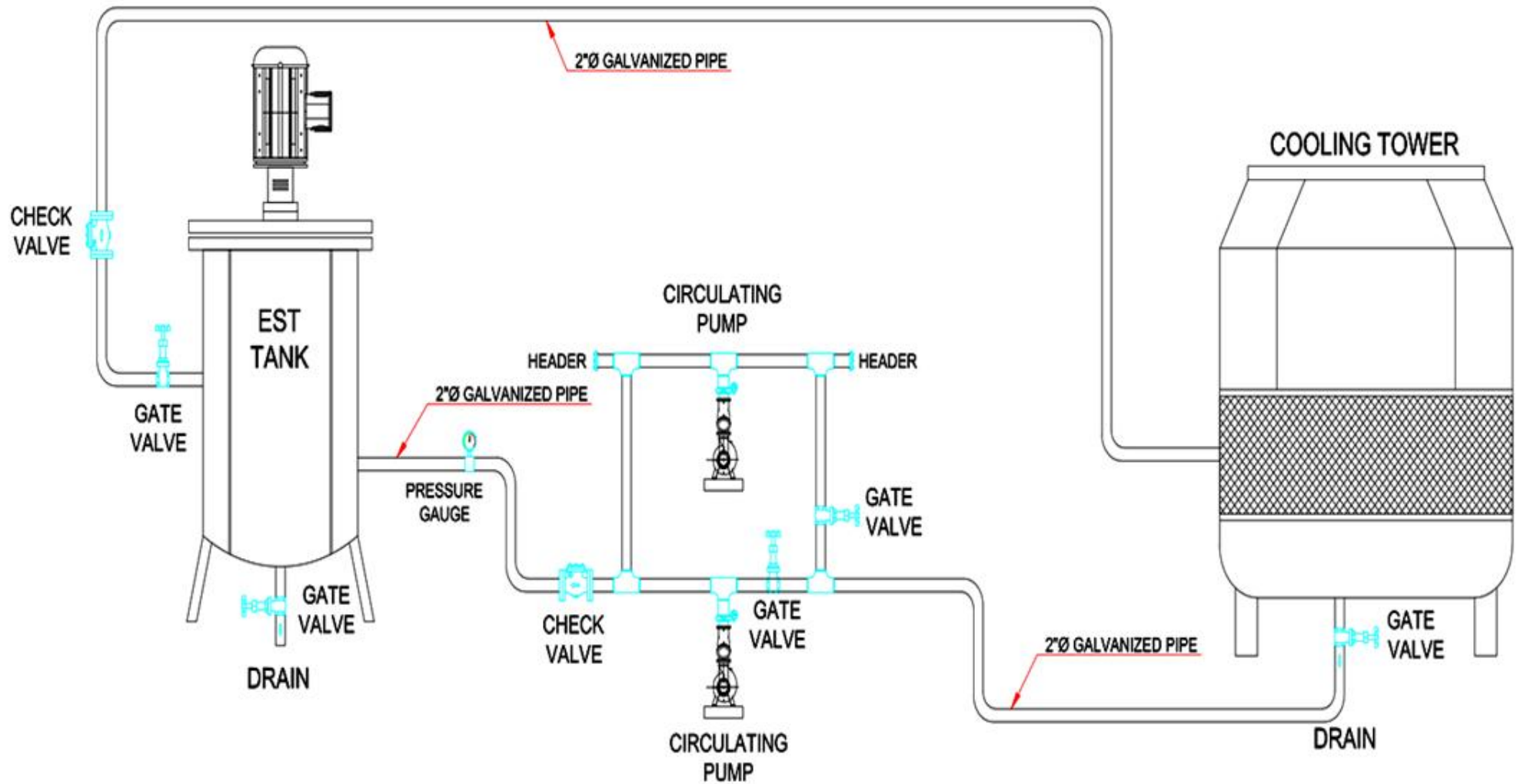
Table 2: Additional data			
pH =	7.7	8	8.6
TDS =	20	34483	273
[Ca ²⁺] =	5	400	49
[HCO ₃] =	10	140	121
T =	20	20	20
			degree C

Bacteria Prevention

Bacteria is killed immediately by contact with oxidizing agents produced by electrolysis in the EST (equations 7 and 8 below). Some other electronic treatment technologies rely on agglomeration of bacteria within flocculants floating in the solution and electroporation which repeatedly reverses the voltage polarization on the bacteria organisms in the water thereby weakening and perforating the outer membrane over time.



Typical Installation



NOTE :

No major retrofiting to be done in the installed cooling tower system.

Full control and supervision:

**Performance is monitored with
complete control of parameters:
PH
CONDUCTIVITY**

**Maintenance & control of the
E.S.T. system is performed on site
with constant access to all figures
& parameters relating to water
quality and system performance
online or scada (separate cost)**



E.S.T -

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**

Eco-friendly system due to;

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



Partial List Of Clients



GRUPO MAHOU SAN MIGUEL®



PHILIPPINES



TOYOTA



HONDA



Hilton



Sheraton

posco



Mercedes-Benz



RABIN MEDICAL CENTER
BEILINSON • HASHARON



Nestlé

Club Med



Strauss

Radisson
HOTELS & RESORTS



HOSPITAL

Assuta

RAISING HEALTH STANDARDS



STATE OF ISRAEL
MINISTRY OF DEFENSE

Chemical Free Waste Water Treatment



GLJM Diversified Sales and Services Corp.

Electrocoagulation (EC) system for the removal of contaminants from water, including

- 1. Metals**
- 2. FOG (Fat/oil/grease)**
- 3. Dyes**
- 4. Suspended particles**
- 5. Chemical and mechanical polishing waster**
- 6. Organic matter from landfill leachate**
- 7. Defluorination of water**
- 8. Synthetic detergent effluents**
- 9. Waste from pulp and paper industries**
- 10. Food and beverages processing**
- 11. Construction sites**
- 12. Mining and metal processing.**

In its simplest form, an electrocoagulation reactor is made up of an electrolytic cell with one anode and one cathode. When connected to an external power source, the anode material will electrochemically corrode due to oxidation, while the cathode will be subjected to passivation.

The Elgressy EC System essentially consists of pairs of conductive metal plates in parallel, which act as monopolar electrodes. It furthermore requires a DC power source, a resistance box to regulate the current density and a multimeter to read the current values. The conductive metal plates are commonly known as "sacrificial electrodes". The sacrificial anode lowers the dissolution potential of the anode and minimizes the passivation of the cathode. The sacrificial anodes and cathodes can be of the same or of different materials.

During electrolysis, the positive side undergoes anodic reactions, while on the negative side, cathodic reactions are encountered. Consumable metal plates, such as iron or aluminum, are usually used as sacrificial electrodes to continuously produce ions in the water.

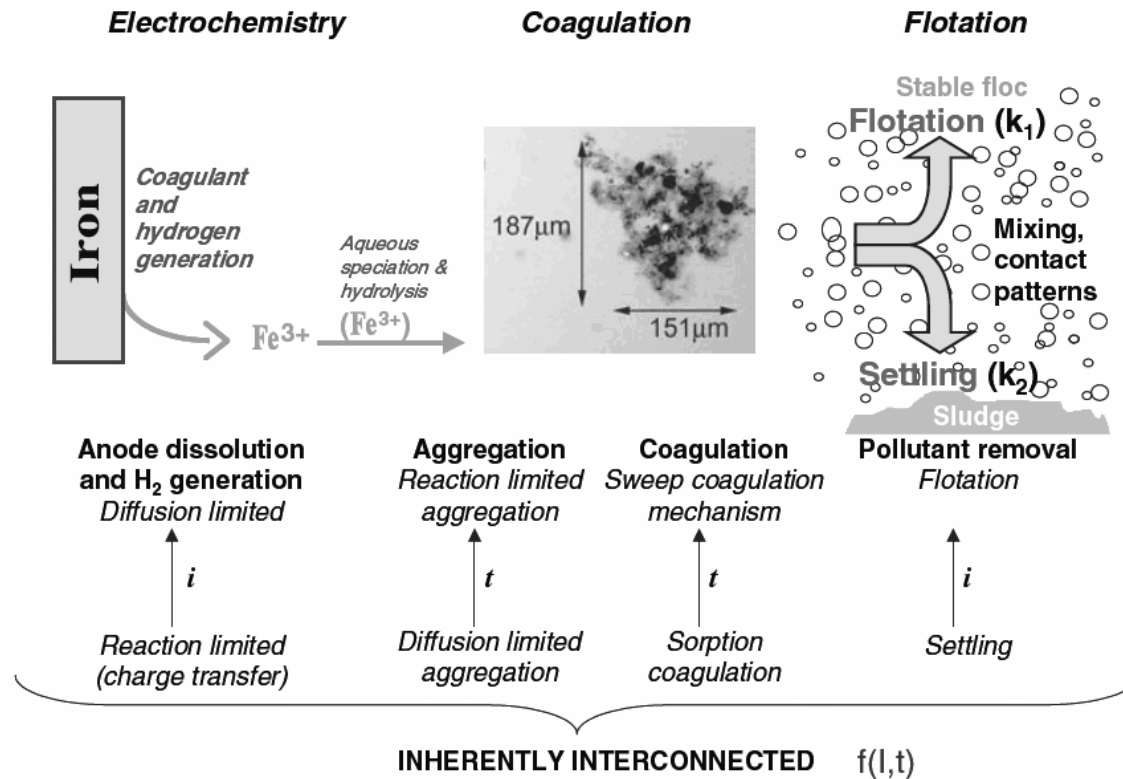


Figure 1 Mechanistic summary of electrocoagulation

The EC technology offers an alternative to the use of metal salts or polymers and poly-electrolytes for breaking stable emulsions and suspensions. EC removes metals, colloidal solids and particles, and soluble inorganic pollutants from aqueous media by introducing highly charged polymeric metal hydroxide species. These species neutralize the electrostatic charges on suspended solids and oil droplets to facilitate agglomeration or coagulation and resultant separation from the aqueous phase. The treatment prompts the precipitation of certain metals and salts.



Advantages:

- EC can handle the most dramatic, dirty, polluted wastewater imaginable, but for a price.
- No need for chemicals, hence environmentally friendly.
- EC systems are simple, easy to operate and virtually maintenance-free.
- Wastewater treated gives palatable, clear, colorless and odorless water.
- Sludge formed by EC tends to be readily settlable and easy to de-water.
- EC floc contains less bound water, is acid-resistant and more stable than chemical floc.
- The gas bubbles produced during electrolysis can carry the pollutant to the top of the solution, where it can be easily concentrated, collected and removed.



<u>Contaminants Removed</u>	<u>Percentage of Removal</u>
a) BOD	90%+
TSS (Clay, coal, silt, silica, etc.)	99%+
Fats, Oils, Grease	93-99%+
Water From Sludge	50-80%+
Heavy Metals	95-99%+
Phosphates	93%+
Total Coliform	99.99%+



Before



EEC Treated



5 Min.



10 Min.

Water from a metal plating facility treated with the EEC Electrocoagulation system.



1) Meat Rendering Water Processed With The Elgressy Electrocoagulation System

CONTAMINANT	SOURCE	RAW mg/l	TREATED	% REMOVAL
Aluminum	Can Mfg.	224	0.693	99.7%
Arsenic	Steam Cleaner	0.30	<0.01	96.7% +
Barium	Steam Cleaner	8.0	<0.10	98.7% +
Calcium	Cooling Tower	1,321	21.4	98.4%
Cadmium	Electroplating	31	0.338	98.9%
Chromium total	Condenser wash	139	<0.1	99.9%
Cobalt	Steam Cleaner	0.13	<0.05	62% +
Copper	Electroplating	287	0.484	99.8%
Iron	Acid Mine	151	0.57	99.6%
Lead	Manufacturing	8.21	0.23	97.2%
Magnesium	Ammunition Plt	6.7	<0.1	98.5%
Manganese	Ammunition Plt	0.28	0.047	83.2%
Mercury	Steam Cleaner	0.006	<0.002	66.6% +
Molybdenum	Steam Cleaner	0.18	0.035	80.6%
Nickel	Manufacturing	185	0.2	99.9%
Silicon	Acid Mine	21.7	0.1	99.5%
Vanadium	Steam Cleaner	0.23	<0.01	95.6% +
Zinc	Plating	221	0.14	99.9%
BOD	Fish Process	40,500	750	98.1%
TSS	Municipal POTW	5,620	25	99.6%
Fog	Food Process	18,165	28	99.9% +