

Transforming water from
source to
resource

Through best-in-class Electro Coagulation
and Ozonation Treatment Systems





Infusing life in the sustainable source of life

An elixir of life, water not only sustains the world, but also shapes civilizations. The world's oldest civilizations find their roots in the river banks. Trade and commerce could have never flourished without seaports. With passage of time, water has been reduced to a mere source of fuelling business and sustaining lives.

The World Health Organisation (WHO) states that nearly 1.1 billion people do not have access to a clean drinking water source. In such scenario, it is imperative that we infuse water conservation into our

day-to-day life, as well as commercial activities. The treatment of industrial and domestic sewage water can make a huge difference to our water consuming patterns.

Electro Coagulation (EC) is a water treatment process that has revolutionized the water treatment industry. A sustainable technology, EC utilizes a highly effective Electrocoagulation process wherein an electric field is applied across plates to remove various contaminants from water.

About us

Established in 2007, Om Sai Enterprise – OSE, located in Vadodara, was inceptioned with a vision of transforming water from a mere source to resource that can be utilized across varied industries. In the span of half a decade, the company has risen to a level where it can boast of no competition in its field and has paved a way for itself on the path of progress. The core concept of OSE is Research & Development of new innovative technology, waste treatment and waste destruction, by developing of sustainable & cost effective technology for waste water treatment, recycling & reuse in comparison to conventional technology.

OSE excels at clean & green technology, renewable energy projects like waste management, ETP & STP, and consultancy. OSE has developed expertise in designing special purpose renewable energy projects with all kinds of engineering

inputs, customizable according to the needs of the client. Backed by efficient companies in varied fields of environment projects execution, development, engineering, commencement and construction, OSE has managed to build an enviable list of projects and clientele and is planning to set its foot in the overseas market. The company also provides technology transfer services.

The secret of OSE's success is its human resource asset that drives the business. The team at OSE includes one of the best & qualified environment consultant & EPC contractor companies along with the team that is technically sound and efficient, which believes in keeping updated with the latest trends and combines passion and dedication with experience from all walks of life, resulting into extraordinary outcomes.





Influent
Raw Sewage



In Process,
exit through EC
(4 minutes)



Nett Result
(30 min in Settling Tank)

Bid farewell to the hazardous and expensive chemical treatment , as we at OSE safeguard the environment, reduce your operating costs, conserve water and reduce energy consumption through Electro Coagulation, a technology widely used by power plants, refineries, industrial manufacturers, food producers and processors, hotels, malls, agriculture and other industries, to name a few.

This process is done by applying current to the electrolytic cell plates causing trace amounts of the plate material to be dissolved into the water. The action is similar to adding separation chemicals (polymers) to a chemical treatment system but much less expensive.

Coagulation As previously defined, the electrical current and trace dissolved metals from the electrolytic cell plates, causing the suspended matter to come together, forming larger particles. Flotation – During the reaction in the cell housing, oxygen bubbles are formed and attached to the coagulated matter, causing it to rise to the surface in the separation tank where it is removed and transferred to the sludge holding tank. The air bubble separates from the separated contaminant allowing it to sink to the bottom of the sludge holding tank where it stays until it is properly disposed off.



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Special Features of the Electro Coagulation Process Plant:

- Chemical Free, Non Biological
- Skid Mounted Modular in Construction
- Start Stop at user own will and user friendly
- Custom Designed based on the Volume of waste water
- Easily Expendable
- Can be Retrofitted in the existing facility
- Small Foot Print
- Very Low Operating Cost
- Less requirement of civil construction
- Simple & Easy to operate and maintain
- Sludge production can be 30-70% LESS voluminous compared to chemical processes
- Non-selective process on a wide variety of contaminants



Function of Electro Coagulation Process Removes:

- Organic
- Suspended Solids
- Turbidity
- Algae
- Odour
- Fat, Oil and Grease
- Heavy Metals
- Colour & Disinfects water

Advantages of Electro Coagulation Process:

- Removal of High Contaminant in the waste water
- Save Energy & Chemicals
- Far less Skill require in Operating & Maintenance
- Noiseless Operation
- Low Capital , Operating & Maintenance Cost
- Colour Removal
- BOD Removal
- COD Removal

Parameters	Inlet	Before Tertiary Treatment	Post Tertiary Treatment
BOD Mg/L	250-300	<50	<20
COD Mg/L	400-500	<150	<100
TSS Mg/L	150	<10	<1
Oil & Grease	<20	<3	Nil

Electro coagulation (EC) Base Sewage Treatment Plant Process Flow:

Step 1: Lifting of raw sewage from equalization tank / collection tank through Pump and sending it to Electro Coagulation (EC) reaction chamber

Step 2: Aluminium Cell base EC reactor applied control electrical field in to the raw sewage water and Current is applied to the electrolytic cell plates causing trace amounts of the plate material to be dissolved into the water. Electrical current and trace dissolved metals from the electrolytic cell plates, cause suspended matter to come together, forming larger particles.

Step 3: After EC reactor process, water along with suspended matter will go to ozonation tank where adequate quantity of ozone will be depositing in to the Ozone tank for the purposes of disinfection (primary use) and also decontamination or remediation. Ozone is a very strong oxidant and virucide. Ozone is more effective than chlorine in destroying viruses and bacteria. The ozonation process utilizes a short contact time (approximately 10 to 30 minutes). There are no harmful residuals that need to be removed after ozonation because ozone decomposes rapidly. After ozonation, there is no re-growth of microorganisms, except for those protected by the particulates in the Ozonation stream. Ozonation elevates the dissolved oxygen (DO) concentration of the effluent. The increase in DO can eliminate the need for re-aeration and also raise the level of DO in the receiving stream. Not Require any aeration. Remove heavy bacteria load in water. Remove contamination in water.

Step 4: After the ozonation process, water will be transferred to Sludge separation tank / tube settler. The air bubble separates from the separated contaminant allowing it to sink to the bottom of the sludge holding tank where it stays until it is properly disposed of through sludge filter / bag filter.

Step 5: After separation of sludge, treated water send to IMT (Inter Mediate Tank) where treated water will have very negligible amount TSS, will be lifted through pump & send it to Carbon filter for final polishing of water.

Step 6: After Carbon Filter, treated water will be collected to collection tank for further line of action.



Qualitative Comparision of STP's Commonly used in India with OSE's EC System :							
Waste water treatment System		ABR : Anaerobic Baffled Reactor (Multi- Baffled Septic Tanks)	Activated Sludge Aerated Reactor	MBBR : Moving Bed Biofilm Reactor	SBR : Sequential Batch Reactor	MBR : Membrane Bio Reactor	OSE Electro Coagulation base waste water treatment system
State / Flow of Treatment	1	Bar Screen	Bar Screen	Bar Screen	Bar Screen	Bar Screen	Bar Screen
	2	FOG Removal	FOG Removal	FOG Removal	FOG Removal	FOG Removal	FOG Removal
	3	Anaerobic digestion with seperation and settlement in Primary tank. FOG removal at First & Second Baffle	Equilization	Equilization	Equilization, Filling and Mechanical Mixing	Equilization	Equilization
	4	Anaerobic digestion with seperation and settlement in Secondary tank.	Reaction with Strong Aeration	Reaction with Aeration + Thousand of plastic rings	Reaction with Strong Aeration for 60-90 min batches	Aerated Digestion with dewatering	Electro Coagulation with primary oxidation
	5	Filtration	settling / Clarifying followed by decantation	settling / Clarifying followed by decantation	settling / Clarifying followed by decantation		Secondary Oxidation
	6	Collection and Tartiry Treatment by ozone / chlorination	Collection and Tartiry Treatment by ozone / chlorination	Collection and Tartiry Treatment by ozone / chlorination	Collection and Tartiry Treatment by ozone / chlorination	Collection and Tartiry Treatment	Filtration / Settling / clarifying followed by decantation
Waste water treatment System		ABR : Anaerobic Baffled Reactor (Multi- Baffled Septic Tanks)	Activated Sludge Aerated Reactor	MBBR : Moving Bed Biofilm Reactor	SBR : Sequential Batch Reactor	MBR : Membrane Bio Reactor	OSE Electro Coagulation base waste water treatment system
Advance	1	Resistant to organic and hydraulic shock loads	Resistant to organic and hydraulic shock loads	Compact Design	Greatly Reduce Retention time	No Need for Settling / decantation, filters do the work of settlers	Lowest Hydraulic retention time
	2	No Electrical Energy Require	Graywater can be managed concurrently	Limited Expension possible with increase in Ring quantities	Main Plant has small foot print	water quality is very good , resulting in reduced Tertiary treatments	Lowest foot print / comparable to MBR
	3	Graywater can be managed concurrently	Can be built & repaired with locally available material	Single Pass process : No sludge recycling	Graywater can be managed concurrently	Increased sludge retention time (15 days)allow for better digestions	Resistant to hydrylic shock
	4	Can be built & repaired with locally available material	High Reduction of Organic	No MLSS's required to operate	No Real problem with Flies & odour if used correctly	Smallest foot print of all plants	Easy to Maintain, consumables are locally available materials
	5	Long Service Life		Graywater can be managed concurrently		Graywater can be managed concurrently	Easy to Modify & Upgrade
	6	No Real problem with Flies & odour if used correctly		High Reduction of Organic		High Reduction of Organic	High Reduction of Organic
	7	High Reduction of Organic		No Real problem with Flies & odour if used correctly		No Real problem with Flies & odour if used correctly	No Real problem with Flies & odour if used correctly
	8	Moderate Capital cost, Low operating cost, depending on emplying cycles					Moderate Capital cost, Low operating cost, depending on comparable to MBBR
	9	Increased Sludge Retention time (SRT 90 days) allows for better digestion					Treat waste water on demand i.e. No water-system is shutdown & is restarted immediately without lag time
	10	Difficult to destablize once activated					NOT dependent on Biological or Environmental factors
	11						Average 3 HP connected Load for 10000 liters per hours flow rate
	12						Can be Skid Mountain & made portable
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Disadvantages	1	Required costant source of water . Minimum 10% of operational load is required per day	Requires constant Electricity	Requires constant Electricity	Requires constant Electricity	Requires constant Electricity	Requires constant Electricity
	2	Effluent from reactor must be filterd prior to further tertiary treatment	Large foot print	Large sludge generation due to low SRT's	High Sludge generation rates due to rapid shifts from Aerobic environment to anaerobic/anoxic environment	Most Expensive System	Generates 3-4 % wet sludge of waste water through put
	3	Low reduction of bacteria , thus requires tertiry treatment to remove pathogens e.g. chlorination or ozonation	Low reduction of bacteria , thus requires tertiry treatment to remove pathogens e.g. chlorination or ozonation	Longer sludge settling time , requires higer flocculation aids	Require 40 -70 Mg per liter Alkalinity	High Operation Cost	No require any coagulation Aids to speed up the reaction
	4			Difficult to maintain as no bacterial redosing is done to maintain system	Fed-Batch Process: lack of water can damage the processing in aerobic environment	Limited operational life of filters (biomembranes)	Limites operational life of electrode , requires timely replacement of Electrode
	5				Requires a variable aeration system , preferably with multipal blowers	Large buildup of sludge if bacteria are accidentally killed	
	6				Sludge requires special treatment		
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Foot Print Required Scale of 1 - 10 1 = small 10 = large		8	9	5	4	3	2
		Generally require hydraulic retention time to of 24 hours to process the water	Generally require hydraulic retention time to of 36-48 hours to process the water	Generally require hydraulic retention time to of 16 hours to process the water	Generally require hydraulic retention time to of 14-16 hours to process the water	Generally require hydraulic retention time to of 6 hours to process the water. However , concentrated sludge left behind may require upto 7 days to digest	Generally require hydraulic retention time to of 30 Minutes to process the water. Concentrated sludge left behind is fully oxidized and no further composting is possible , only dewatering is require
Capital Cost Scale of 1 -10 1 = Low 10 = High		7	8	6	7	10	6
Operating Cost Scale of 1 -10 1 = Low 10 = High		3	5	7	8	10	5

