Seerdrum EC
Electro Coagulation

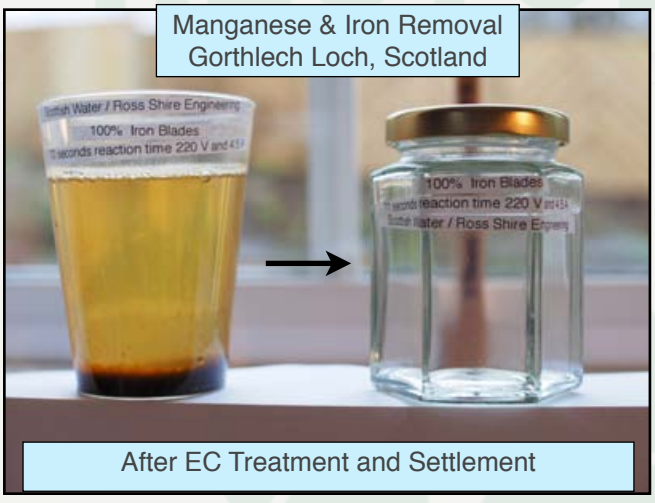
Electro Coagulation (EC) is a well established technology for the treatment of waste water without the need for process chemicals such as Ferric, PAC or polymers.

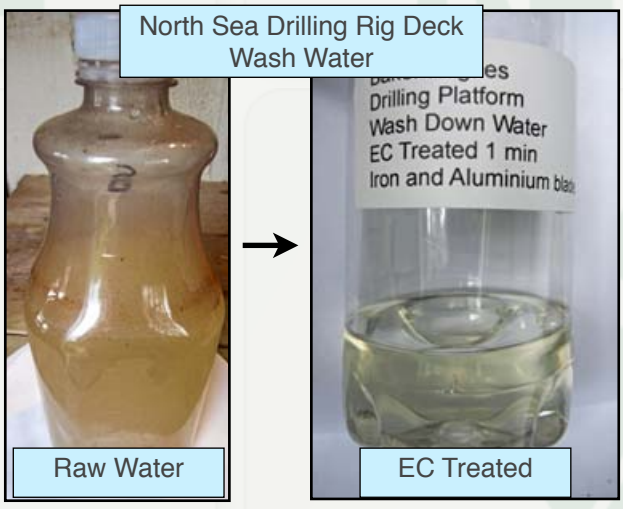
A wide range of pollutants can be efficiently removed including heavy metals, suspended and colloidal solids, FOGs, bacteria, viruses, hydrocarbons, pesticides and herbicides.

EC is a good pre treatment to membrane technologies where high quality water re-use is required.

Applicable Industries

- ★ Pharmaceuticals
- ★ Metal Plating
- ★ Oil & Gas
- ★ Anaerobic Digestion
- ★ Mining
- ★ Concrete Crushing
- ★ Food Manufacturing
- ★ Meat and Fish Processing
- ★ Vegetable Washing
- ★ Sludge Dewatering
- ★ Algae (Red Tide) Treatment
- ★ Textile & dye
- ★ Water Treatment
- ★ RO Pre-Treatment
- ★ Ground Remediation
- ★ Surface Water
- ★ Sewage Treatment
- ★ Car & Truck Wash
- ★ Coal Washing
- ★ Produced Water
- ★ Fracking





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Electro Coagulation

The Electro Coagulation Process

Electro Coagulation is the process of applying a direct current voltage to the waste water to be treated using submerged electrodes which act as the anode and cathode. Typically, these electrodes are made from mild steel and aluminium. The current passes between the electrodes due to the conductivity of the water.

The electrical current acts on the suspended particles in the water, neutralising their charges and allowing the very fine solids to precipitate and settle.

The electrical current also makes the electrodes sacrificial and in doing so, they give up their metal ions into solution in water. These ions act as chemical coagulants used in DAF systems.

Suspensions and emulsions are destabilised, solids coagulate and separate out and and hydrocarbons coalesce.

The EC reaction time is typically between 20 and 120 seconds depending upon the contaminants being treated.

The consumables are electricity and the sacrificial electrodes. Both these directly effect the EC operational cost. Energy consumption is typically 0.8 kwHr per cubic meter (1000 litres) treated with a metal electrode consumption of around 20 grammes per cubic meter treated.

Sludge production in chemically treated waste water treatment carries a very significant expense in terms of the volume produced and the cost of further chemicals in its dewatering. This is because chemicals are added, often in large quantities. By comparison, EC produces significantly less sludge with much lower sludge handling costs. Unlike chemically produced sludges, EC produces a broadly neutral pH, easy to dewater and non-leaching, oxide sludge. Handling and disposal costs are much reduced.

Electro Coagulation - Electrical Description

Electro Coagulation (EC) requires a direct current (DC) voltage to be applied to the submerged electrodes in the reaction chamber. The incoming voltage is AC and therefore needs rectifying before it can be applied. The incoming electrical supply is typically 400V three phase but for smaller EC plants 230V single phase can be used.

Seerdrum first employ a 1:1 isolation transformer for safety and then the AC supply is converted to DC via a fully configurable and controllable digital DC drive. This delivers a fully variable DC voltage to the electrodes.

The EC process depends upon the electrical Current Density (CD) applied to the electrodes and the available surface areas of the electrodes. The Seerdrum EC provides a very large electrode surface area relative to the flow rate meaning the CD can be minimised for the specified reaction time. The current drawn is dependent on the conductivity of the water which can vary extensively. It is therefore important to be able to vary the voltage and hence the current to ensure the minimum current, and hence energy consumed, is drawn for a complete EC reaction. Any excess voltage or current drawn leads to wasted heat. Because the operator of the Seerdrum EC is able to fully taylor the voltage applied, the absolute minimum electrical energy and metal electrodes are consumed.

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