

MCKAY CREEK TECHNOLOGIES Ltd.

ELECTROCOAGULATION WASTEWATER TREATMENT SYSTEMS

McKay Creek Technologies Electrocoagulation is a patented and patent pending breakthrough process that allows the beneficial attributes of electrocoagulation to be utilized as a remedial wastewater treatment method that is industrially robust, cost efficient and easy to operate and maintain.

The Benefits of Electrocoagulation, or EC, have been known since first patented in 1906 when it was observed that stable emulsions and suspensions could be destabilized when exposed to electrically charged iron or aluminum electrodes. Over the next century many designs were marketed to remove contaminants from marine and industrial wastewater, some of them worked to varying degrees, but their use and acceptance has been limited due to contaminant fouling of the electrodes.

How EC Works

EC uses an electrical current to dissolve a sacrificial anode and thereby introduce chemically reactive ions into the wastewater stream. These positively charged ions are attracted to the negatively charged droplets and particles of the contaminants in emulsion or suspension. The resulting agglomerations increase in size until they are no longer stable and form flocs and coagulants that can be removed.

EC directly addresses the three main factors that lead to a stable suspension of suspended solids and emulsified oils: ionic charge, droplet or particle size, and droplet or particle density.

The Problem that has plagued EC until now is the undesirable ability of the anode and cathode to collect or “harvest” solids from the treatment stream in the form of hard scale and sticky gel deposits. As these deposits increase, the anode and cathode become electrically insulated from the treatment stream, the electrode gap fills, and treatment effectiveness decreases. The fouled cell would require a shutdown and cleaning, rebuilding or replacement of the electrodes. Most designs employ very large electrode areas so they can continue when heavily fouled and occasionally employ polarity changes, high volume flushing or acidic or caustic flushing to rid the cell of the deposits. A few companies continue to market EC systems today but struggle with the same limitations that have always plagued the technology.

The function of the EC cell is to dissolve the anode, which delivers chemically reactive ions into the wastewater stream. When this can be accomplished, without electrode fouling, in a consistent, controlled manner that delivers one hundred percent of the

particles into the treatment stream as they are released from the anode, the technology can be utilized on an industrial and commercial scale.

The Solution to the Problem of electrode fouling has eluded discovery for more than one hundred years until, through experimentation, we discovered the fundamental factor that eliminates electrode fouling. This is a major discovery that changes everything you know about EC and, the benefit of this technological leap forward is not available from any of our competitors.

We Stand Alone

Our cathode does not become passivated or corroded, and the single anode dissolves cleanly in an even and predictable manner. We have done away with polarity changes, complicated electrical control panels, back flushing, chemical washes, wasted electrode material and treatment bypass.

The anode is efficiently dissolved providing a continuous and controlled level of treatment, perfectly matched to the level of contamination in your treatment stream. 80 to 120 litres per minute for each treatment cell is typical for industrial oily water. Higher treatment rates are achieved with lower contamination levels.

The McKay Creek EC CELL is constructed from stainless steel with a non-conductive liner to provide electrical insulation. The design provides a no bypass treatment flow and excellent hydrolysis gas management.

The MCT EC CELL is reliable and industrially robust.

All metal fittings are stainless steel to provide long life in abusive and corrosive environments.

The anode is a proprietary mixture of aluminum and other elements that provides a consistently high quality non-fouling source of ionic particle treatment. With heavily contaminated oily bilge and shipyard wastewater or with industrial wastewaters we have experienced, one million liters of treatment per anode is typical.

The McKay Creek EC POWER SOURCE is designed to operate continuously without overstressing the components. This results in a long and trouble free operation, and off the shelf components allow excellent service if required.

The **McKay Creek EC FLOC SEPERATION TOWER** is designed to vent the gasses produced in the cell from the liquid stream and then split the liquid stream into an overflow of contaminant flocs and an underflow of clear treated water for reuse or discharge.

WHAT McKay Creek EC WILL DO

EC works well to treat wastewaters contaminated with emulsified oils, BETX, PAHs, poorly settling solids, poorly soluble organics, contaminants in general that add turbidity to water, as well as negatively charged metal species. Heavy metals and soluble organic compounds are removed from the wastewater by EC in association with the removal of emulsified and particulate solids.

REASONS TO USE McKay Creek EC

- Wastewater contaminants are difficult or expensive to remove by commonly available treatment methods.
- Limited available space requires a high capacity low footprint solution or portability.
- There is a significant environmental or monetary benefit to providing high water quality for reuse or discharge.
- The environmental impact and high cost of traditional treatment chemicals and residuals disposal costs encourages minimizing or eliminating their volume.

McKay Creek EC AND YOUR WASTE STREAM

EC is the right choice for disposal of ships bilge water and shipyard vessel degreasing/cleaning operations as well as mining, manufacturing and commercial wastewater disposal operations as well as other operations that use flocculants and polymers to remove contaminants. If large volumes of contaminated water must be reused or disposed of efficiently, McKay Creek EC may be the right treatment for your waste stream. It is mechanically simple, easy to operate and built to last. Call us for more information or a demonstration.

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