



# Emulsion Waste Water

Oils and greases bind in certain ways with water and may produce a phase known as emulsion. This is a molecule more-or-less loosely put together by ionic charges that involve the organic molecule and water molecules. With soaps, there is also a magnesium, calcium or similar atom involved. An emulsion is not simply oily water though there may be some free oil and grease in the waste stream, too, which will float at the top of the water and emulsion phases. An emulsion is a mixture of two or more non mixing liquids held in suspension by a small percentage of substances called emulsifiers.



Generally in industrial situations, an emulsion is formed by some type of oil, animal fat, vegetable oil or organic oil becomes coated by a protein or carbohydrate polymer thus allowing the oil to remain in suspension.

## Typical Industrial Processes Causing Emulsions

In most industrial applications, there is much more water than oil, and for these emulsions the water is known as the continuous phase and the oil the disperse phase. Waste water emulsions are found at:

- Fish and other food processing facilities
- Oilfield equipment repair and wash-down facilities
- Truck, train and bus wash facilities
- Refinery wash bays and process cleaning operations
- Non-circulating coolants with water-based additives from machine shops



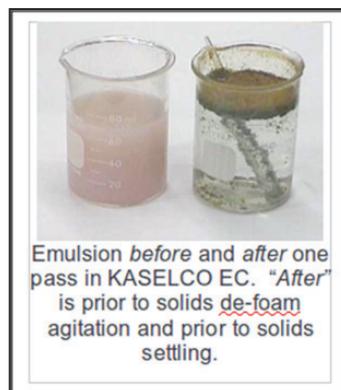
## KASELCO EC Treatment

In the emulsion waste water generated in equipment wash operations, there is usually an amount of suspended solids. Much of this is held in suspension in the same way, or by van der Waals forces (small enough particles to be effected by molecular electrical influences). There may also be some traces of heavy metals either in suspension or dissolved.

One of the most beneficial aspects of KASELCO EC is that our technology can treat several water contamination issues simultaneously.

Here's what happens to these pollutants in the wash water:

- **Metals:** an iron molecule is driven off of a sacrificial steel plate in the reactor. In the presence of the electrical field in the reactor, a reactive iron complex is formed. The iron complex creates a hydroxide we call "green rust". This green rust attracts and reacts with the metals in the wastewater, creating an iron-metal-hydroxide polymer. The molecule is stable and insoluble. This big molecule comes out of solution and settles from the water.
- **Emulsion:** The "green rust" compounds react with the emulsion polymer to form a complex iron organic polymer - a ferric-neutralized surfactant. This big insoluble molecule settles from the water.
- **Suspended Solids:** In the electrical field of the KASELCO reactor the charge on the suspended solid is altered. No longer held up by the charge of the water molecules, the solid sinks.



## A KASELCO Electrocoagulation Package

To treat your emulsified waste water, order a KASELCO Electrocoagulation system designed for your process.

The metals, emulsions, soaps and solids treated out of the waste stream as iron complexes will settle out in properly sized standard solids separation systems. We can provide these components as part of a complete EC package.