

Wastewater Recovery and Recycling Systems

Mech-Chem Associates, Inc. has expertise in solving industrial wastewater problems for various manufacturing industries with the focus on rinse water and wastewater recovery and recycling projects in these applications:

- ♦ **Plating/Metal Finishing**
- ♦ **Acid Etching / Chem Milling**
- ♦ **Alkaline Cleaning/ Anodizing**
- ♦ **Electronic Devices & Components**
- ♦ **Precious Metals Processing**
- ♦ **Glass/Ceramic Manufacturing**
- ♦ **Stainless Steel & Metal Alloys**

Mech-Chem has developed several unique process designs which treat rinse water and wastewater streams and produce RO or DI quality water. Mech-Chem also combines these technologies with vacuum evaporation to provide completely closed loop zero-discharge systems.



Ozone(O₃) treatment system for processing oily wastewater to reduce BOD and COD levels for discharge to POTW



RO and DI water storage and piping systems for manufacture of dairy products

Benefits of Recovery and Recycling

Water Minimizations-

Minimize the quantities of water required for processing and manufacturing operations. Wastewater recovery systems can treat and recycle 80%-85% of the dilute rinse water and wastewater generated by production and manufacturing operations.

Improve Water Quality-

The installation of wastewater recovery systems provide manufacturing operations with a constant source of good quality RO or DI water. This eliminates the potential for product variability due to changes in water quality.

Reduce Waste Treatment Costs-

Recovering and recycling rinse water and wastewater streams reduces the usage of treatment chemicals, sludge disposal, operating cost and sewer cost.

Return on Investment (ROI) -

A wastewater or rinse water recovery and recycling system can provide a 2 to 3 year Return on Investment.

Technologies

Mech-Chem utilizes a combination of technologies to provide integrated rinse water and wastewater treatment and recycling systems.

Carbon Filtration-

Carbon filtration is often the first step in the treatment process. Its function is to remove organic matter (i.e. oils, grease, solvents, and surfactants) from the rinse water or wastewater.

UF/RO Systems-

Ultra Filtration (UF) and Reverse Osmosis (RO) systems are normally used in conjunction with other filtration systems to provide clean water which can be recycled back into the manufacturing operations.

Ion Exchange Resin Systems-

Ion exchange is used to remove dissolved ions (anions and cation) from the water through the use of synthetic resins, providing high purity water. The ion exchange resin are regenerated using acid and caustic solutions to remove the ions captured on the ion exchange resin.

Evaporation Systems-

Evaporation is used in closed loop or zero-discharge systems. Evaporating the rinse water or wastewater removes all the contaminants producing distilled water. The concentrated waste, which is normally less than 2% of the water processed, can be shipped off-site for disposal.

Ozone (O₃) Systems -

Ozone is used to oxidize and decompose bacteria, oils, grease, and other organic pollutants found in wastewater. The decomposition of organic substances lower to BOD and COD levels in the treated wastewater.



Carbon Filtration and ion-exchange rinse water treatment and recycling system for a plating facility



50 Gal per hour single effect vacuum evaporator used for the distillation of wastewater from aircraft component manufacturing operations



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