DYNATEC SYSTEMS INC.
The Wastewater Membrane Specialist

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ACID / METAL RECOVERY SYSTEMS

Significant Savings

- Waste stream reduction lowers discharge fees
- Water reuse reduces overall consumption
- Material recovery reduces cost of raw materials
- Easy maintenance avoids labor costs and regulations

Technology Benefits

Membrane Separation Using Nanofiltration (NF) and Reverse Osmosis:

- Simple mechanical process
- Consistent performance
- Ability to reuse concentrated and purified streams
- Low operating costs
- Unattended operation
- Minimizes disposal costs

Contaminants Removed/ Materials Recovered

- Suspended solids and oil removed
- Metals recovered
- Acids recovered

Services Provided

- Systems Design
- Equipment and Installation
- Operator Training
- Maintenance Contract
- DBOO available

Equipment Shown

Typical hollow fiber (top) and spiral-wound elements are shown

Widely Used

Acid is used in a variety of industries from mining to silicon wafer etching and plating, as well as, many other industrial processes. As requirements for reduced waste discharge continue to become more stringent and continuous pressure on costs occurs, different industries are forced to look at new ways to reduce the waste that they produce and discharge. The corrosive nature of these waste streams can be challenging to waste treatment systems, and neutralizing chemicals can be expensive.

Alternative Treatments

Recovery of acids and metals is possible using specially constructed nanofiltration and reverse osmosis elements. They are used to concentrate and purify waste acid streams, and to recover metals-rich streams that can often be reused in the form in which they are recovered, thus reducing waste disposal costs in industrial processes and recovering valuable materials. Membranes are being put into applications that require them to operate under conditions as low as 0.5 pH. These membranes are being used to concentrate acids in order to reduce the volume of disposed waste. In some cases, the membranes are being used to clean the acids so that they are able to be reused. The advanced hollow fiber and spiral-wound membrane configurations allow applications never thought possible before.

Individual System Design

Each system design by Dynatec is unique to the application; however, a few general principles apply. Higher levels of oil and grease and suspended solids will first be removed by a variety of means including micro or ultrafiltration. Where metals or other soluble materials, either for recovery or disposal, have to be removed this will be achieved through the use of nanofiltration, where polyvalent ions are retained and concentrated, and monovalent ions can pass the membrane. The next treatment process involves concentration and recovery of the acid using reverse osmosis. The permeate from this process will often be capable of being used as rinse water, further reducing operating and disposal costs.