APPLICATION REVIEW

Battery Recycler Achieves Zero Liquid Discharge (ZLD) and Recovers Over 80% of Concentrate for Resale

Introduction

A company who recycles over 3,000,000 automotive battery units a year, and produced over 40,000 tons of lead every year needed to recover the water and Sodium Sulfate (Na_2SO_4) coming from the spent sulphuric acid in the batteries, in order to cut costs.

This would cut costs by allowing the company to reuse the wastewater back into the process and it would generate revenue by converting the sodium sulphate into a useful material that could be sold as part of a product for society.

Sodium sulfate is used in many products including home laundry detergents, carpet fresheners, cement, starch, cattle feed additives, and more. About half of the world's sodium sulfate comes from natural sources, while the other half is a byproduct of other processes, such as battery recycling.

The Solution

Because no two wastewater streams are exactly alike, in order to find the best solution to meet the recycler's goals, a careful review of their process was completed, along with a thorough testing and analysis of the wastewater. It was then determined that the PRAB EVALED® Vacuum Evaporator would be the best solution.

Results Achieved

- Zero Liquid Discharge (100% water reuse)
- Over 80% of Na₂SO₄ is recovered
- Na₂SO₄ is sold to cement factory
- Dramatic cost reduction



PRAB EVALED Vacuum Evaporator (RV F 60 FF) installed at recycling facility (226 sq/ft footprint).



Recovered sodium sulfate. Over 80% of concentrate is now recovered for sale.

Wastewater Treatment Process Implemented



Wastewater Treatment Results

Parameters	u.m.	Waste In	Distilled Out	Concentrate Out
pН	-	6.5	6	-
TS at 105° C	%	12	<0.01	>80
Conductivity	µS/cm	>100,000	<80	-
Sulphates	ppm	>70,000	<50	-
COD	ppm	95	<60	-
Chlorides	ppm	48	13	-
Lead	ppm	1.3	<1.0	-



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