PROJECT PROFILE SERIES #25

AUTOMOBILE MANUFACTURER RECOVERS 99.5% WASTEWATER THROUGH COST EFFECTIVE ZLD SYSTEM

The Facility

The manufacturing facility of KIA MOTORS in Sousan, South Korea was undergoing expansion and had to meet the Zero Liquid Discharge requirements for environmental compliance. The facility is located in a water stressed area where the fresh water cost is increasing annually. They were looking for a cost effective Zero Liquid Discharge system as a means to reuse their wastewater.

The Problem

The automotive manufacturing facilities in general use large amounts of synthetic fluids and natural oil-based products in a variety of metalworking operations. This results in large amounts of high-strength organic, oily wastewater with high heavy metal content that needs effective treatment. KIA MOTORS have a conventional wastewater treatment plant generating 1000 M^3/day of treated wastewater, however the new environmental regulations require the facility to install a Zero Liquid Discharge system. Since the facility was expanding the plant was looking for a cost effective means to meet the regulatory requirements and also provide reusable water to partially fulfill the requirements of fresh water after expansion.

The Solution

HERO is a patented reverse osmosis process technology wherein the system operates at an elevated pH environment, resulting in significant advantages over conventional reverse osmosis. High pH operation coupled with some other operational features provide HERO technology based system high resistance against organic / oil & grease fouling and virtually eliminated the biological fouling. The high recovery from the process results in a very cost-effective recycle / reuse system. Aquatech provided a HERO based system recovering 98% of the treated wastewater of the facility. The high recovery through HERO system resulted in a very small reject stream to be concentrated in a thermal unit. Aquatech provided a Forced Circulation Crystallizer unit to meet the ZLD requirements. The distillate, with less than 20 ppm TDS, from the Crystallizer was blended with the HERO permeate for reuse in the manufacturing processes. The overall recovery from the system was 99.5%.

Design Water Analysis

TDS	1,300 ppm
Total Hardness	30 ppm
BOD	30 ppm
COD	30 ppm
Suspended Solids	5 ppm
Oil & Grease	3 ppm
pH	6-8

Reuse Water Quality

TDS	< 100 ppm
pH	7-8

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Process Flow Diagram