CASE STUDY

PLANT-WIDE CLOSED-LOOP SYSTEM PROVES TO BE COST-EFFECTIVE

Overview

High water consumption throughout the plant significantly increased operational costs and created high sewer fees at this major anodizing plant. The site needed a cost-effective plant-wide water redycling system to decrease water consumption at the plant. Exergy installed a plant wide-closed-loop wastewater recycling system. Using Exergy's Advanced Reverse Osmosis (ARO) technology and Electrodialysis (ED), the overall water consumption is reduced by 90 percent. In addition, the plant wide closed loop system significantly reduces operational costs and sewer fees.

CHALLENGE

Exergy's project team has worked with the metal finishing industry for over 20 years. This particular site was experiencing high water consumption throughout the plant which significantly increased operational costs and created high sewer fees. The customer needed a cost-effective plant-wide water conservation system to decrease water consumption at the plant. Based on this experience, and with the cooperation of the mangment, Exergy collected and analyzed every rinse wastewater stream at the site to prepare a closed loop recycling strategy for implementation.

Exergy assessed the water flows to the five plating/anodizing lines, and developed a concept for wastewater recycling based on the specific charachteristics of the wastewater at this plan.

The rinses were divided into two wastewater streams. The stream with low TDS was directed to an ARO system. The second waste stream containing aluminum, silica and zinc was directed into an Electro-coagulation system and then led into a second ARO. Exergy added an electrodialysis (ED) system to remove a build-up of salts from the rejected streams of the ARO systems. The permeates of the ARO and ED systems are recycled as rinse water back into the surface finishing processes.

With the combination of these treatment systems, Exergy achieved an overall reduction in water consumption of 90 percent. The facility's operational cost and sewer fees have decreased, saving the plant significant monthly costs.

In addition, the new water recycling system qualified PAP for the City Water Conservation Rebate program. The water recycling system has been online for more than two years.

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ACTION

- Analyzed every waste stream for TDS, pH and flow rates.
- Added and electrodialysis (ED) system to remove the build-up of salts from the rejected streams of the ARO systems.
- The permeates of the ARO and ED systems are recycled as rinse water back into the surface finishing processes.
- The rinses were divided into two wastewater streams. The stream with low TDS was directed to an ARO system. The second waste stream containing aluminum, silica and zinc was directed into an Electro-coagulation system and then led into a second ARO.

RESULTS

Exergy installed a plant-wide closed-loop wastewater recycling system. Using Exergy's Advanced Reverse Osmosis (ARO) technology and Electrodialysis (ED), the overall water consumption is reduced by 90 percent. In addition, the plant wide closed loop system significantly reduces operational costs and sewer fees.

CUSTOMER BENEFITS

With the combination of these treatment systems, Exergy achieved an overall reduction in water consumption of 90 percent.

The facility's operational cost and sewer fees have decreased, saving the plant significant monthly costs.

- The new water recycling system qualified the customer for the City Water
- Conservation Rebate program. The water recycling system has been online for more than two years.

IN ADDITION:

- Yearly savings in water costs, labor and chemicals totaling $160,000.
- Recovery of rinse water from plating operations
- Reduced water consumption from 120,000 GPD to 10,000 GPD.

ABOUT EXERGY AND ETHORCEL® PRODUCT

Exergy is a technology provider of advanced recycling systems for recovery and purification of purification of resources such as water. Exergy's proprietary and patented Advanced Electrodeionization (AEDI) system is named EthorCEL®, which allows for the recovery of valuable plating chemicals from rinses; and, secondly the production of high-quality deionized water. EthorCEL® continuous electrolytic regeneration does not require chemicals and downtimes, and simply allows for ionic impurities to be segregated and removed from process rinses, making clean deionized water available again for reuse in the process.

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