

## CASE STUDY

### CLOSED-LOOP ETCH LINE PROVES TO BE COST-EFFECTIVE AND REDUCES THE DEMAND FOR WASTE TREATMENT

#### Overview

A well established manufacturer of turbine engine parts. The high quality products made by the Company are used by the U.S. Air Force, and large commercial airlines.

A Blue Etch Line for quality control of parts was needed to process and test the titanium parts. In addition, a wastewater treatment system was needed for the wastewater generated from the line.

Exergy designed and installed a closed loop wastewater recycling system to recycle wastewater back into the line cost-effectively. A cost-savings analysis showed that the closed-loop operational cost was significantly lower than conventional wastewater treatment systems.

#### CHALLENGE

Exergy installed a closed-loop Blue Etch Line for quality control of turbine engine parts made out of titanium. The facility was not equipped with any wastewater treatment system so they needed to consider either recycling or treatment. The Company chose to implement recycling.

The new line was designed per customer specs and featured Exergy's Advanced Reverse Osmosis (ARO) technology to closed loop the line. This eliminated the costly need for conventional wastewater treatment. After a cost comparison of conventional wastewater treatment and wastewater recycling with

pre-filtration and ARO, it was clear that the operational cost with a closed-loop system is cost effective.

Exergy conceptualized a line layout and the rinse water quality based on the calculated drag out from process of systems.

Since completing the project, Exergy has been responsible for the preventative maintenance of the recycling system. Exergy staff has completed regular system maintenance and service support.

#### ACTION

Exergy selected the most appropriate technologies for recycling the rinses, then sized and installed the recycling systems.

Exergy also supervised installation and line construction and trained the personnel by: developing complete manual and training guide to educate staff and provide detailed reference guides.

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.

- ✔ 75% water recovery rate from the Blue Etch Line
- ✔ Significant decrease in sewer and hazardous stream disposal costs
- ✔ Continual operational cost savings
- ✔ Complete training and maintenance program for closed loop system

In addition:

- ✔ Yearly savings in water costs, labor and chemicals.
- ✔ Recovery of rinse water from plating operations and avoiding waste treatment.
- ✔ Reduced water usage from 5 gallons per minute(gpm) to 0.5 gpm



## RESULTS

Exergy's ARO technology can reduce operating costs significantly by enhancing recovery and reuse of valuable waste by-products. Exergy offers many ARO options and custom systems to meet special requirements. Unique plant operating conditions and applications can be incorporated into the standard system control software, modified easily as production changes and grows.

## CUSTOMER BENEFITS

Besides the compliance and regulatory costs avoided, Exergy was able to also save customer the following cost saving:

### Water Savings Implementation Benefits

- Removal of Metals from rinses to address the site's regulatory requirement
- Generation of high purity DI water for use back in wet processing
- Allowing the customer to meet the water demands of the process with the recycling system.
- Water savings to over 250,000 gallons of water savings per month for the one process line, and over 2.8 million gallons of water saved annually

### Cost Savings

- Cost of saving fresh water purchases and sewer charges
- Cost Saving in DI water production
- ROI of the systems for 1 and 1.5 years respectively

## 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.

