

# CASE STUDY

## PRINTED CIRCUIT BOARD COPPER BOARD CLEAN PROCESS CLOSED-LOOP

### Overview

This major printed circuit board site was faced with high cost for purified deionized water to operate its various processing lines. The DI water was being wasted after one use and the demand for this was increasing.

### PROBLEM

This high-volume, high-quality manufacturer of multi-layer PCBs, processing millions of pieces at a specific site, encountered high costs associated with purified deionized water necessary for operating its diverse processing lines within this major printed circuit board facility.

- ✔ Recycle and recover the deionized water used for board cleaning
- ✔ Remove specific metals such as copper from the process area and direct it for recycling.
- ✔ Provide continuous deionized water for processing and reuse in board clean line.

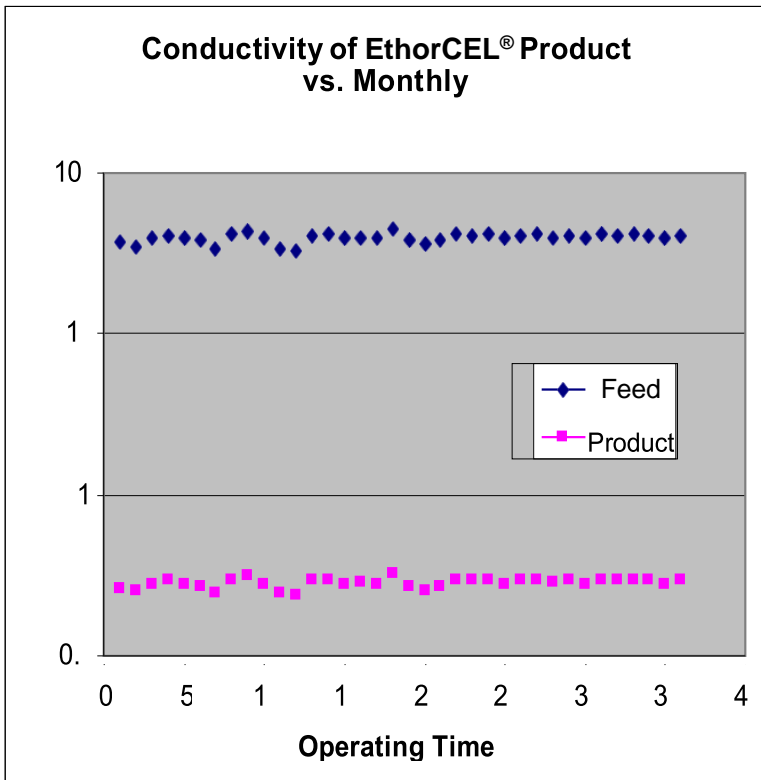


- ✔ The water rinses are recycled continuously for reuse in the process; high-quality D.I. water is purified and send back into the rinse system.
- ✔ The 10% reject from the recycling process is collected for recycling of copper and/or batch treatment.

### RESULTS

Process line required 16 gallons per minute (gpm) of Continuous DI. City water, sewer charges and treatment costs of Ion exchange bottle exchanges were avoided by implementing Exergy EthorCEL<sup>®</sup> solutions. The process lines require 16 gallons per minute (GPM) of continuous DI water supply. The city water, sewer charges, ion exchange rental bottles and wastewater fees, cost the Company in excess of \$155,000 per year. Savings in these costs provided the Company with a return of investment of about 3 months for the EthorCEL<sup>®</sup> rinse water recycling systems.

EthorCEL<sup>®</sup> has now successfully operated for several years at the site, removing the metals of concerns. The systems have demonstrated the performance of the EthorCEL<sup>®</sup> technology in an industrial application. The evaluation of operational data allowed a cost/benefit analysis for deionized (DI) water.



## CUSTOMER BENEFITS

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

### Cost Savings

- Cost savings in waste treatment chemicals
- 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

### Implementation Benefits

- 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

## ABOUT EXERGY AND ETHORCEL<sup>®</sup> 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<sup>®</sup>, which allows for the recovery of valuable plating chemicals from rinses; and, secondly the production of high-quality deionized water. EthorCEL<sup>®</sup> 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.

