

POLLUTION PREVENTION

IN RHODE ISLAND

Case studies of the Rhode Island On-Site Technical Assistance Program

Jewelry Mfg. Rinsewater Recycling

Jewelry manufacturer uses ion-exchange to recycle rinsewater following cleaning tanks in a plating operation

Industry \ Contact

SIC Code: 3911 Electroplater, Rhode Island

Contact: Herff-Jones, Inc.

Technology Description

The company creates and manufactures class rings, emblematic recognition awards, prestige trophy and plaque awards for motivation, recognition awareness and involvement in schools, hospitals, government, and industry, and employs approximately 225 people. One of the primary operations of the company is electroplating.

Before plating in both rack and barrel operations, parts are immersed in aqueous, ultrasonic, and electrocleaning solutions. The rinses following these cleaning steps were originally sent to the company's waste treatment system before sewer discharge. The company installed ion-exchange to clean and recycle this rinsewater thereby eliminating this discharge. Regeneration of the ion-exchange columns creates a low-volume, higher concentrated solution which is easily handled by the company's chemical treatment system.

Feedstock Materials

Rinsewater flow rate: approximately 3.75 gals. per minute (432,000 gals. annually)

Waste treatment chemicals: Caustic, Acids, Flocculants

Wastes

3.75 gallons of rinsewater per minute sent to sewer. Waste treatment sludge volume difficult to estimate, as the treatment system services many different plating lines.

Costs

Ion-exchange system: Approximately \$7,200

Ion-exchange regeneration station: Approximately \$1,625

(The total cost of the regeneration station was \$6,500. Several different processes share the regeneration station; therefore, \$1,625 is the cost associated with copper regeneration.)

Operation \ Maintenance

Pump power: \$/yr

Regeneration: Sulfuric Acid, 30 gals. per month, \$ 50/yr

Sodium Hydroxide, 30 gals. per month, \$ 150/yr

Savings

The company eliminated the purchase of rinsewater from the city saving 432,000 gallons per year at a cost savings of \$7,500. Treatment chemical use has also decreased.

Treatment/Disposal costs have decreased along with sludge volume due to diminished use of the pretreatment system. Regeneration of the columns still requires chemical treatment.

Payback Period

Estimated to be 2 1/2 years.

Impact

The company has eliminated the purchase of city water for the pre-plating rinses. In addition, treatment and disposal costs have decreased as has the dependence of the facility on its chemical treatment system. The company has also installed similar systems on their other plating lines to further reduce water and waste treatment chemical use (**See case study #'s 38-42**).