

POLLUTION PREVENTION

IN RHODE ISLAND

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

Die Caster Vibratory Solution

Die caster utilizes ultrafiltration to close-loop vibratory process.

Industry \Contact

SIC Code: 3369 Precision Zinc Die Caster, Rhode Island.

Contact: Company #6

Technology Description

The company is engaged in the production of precision zinc die casts. The average employment of the company is 10.

In a vibratory process for finishing die cast zinc parts, 5,000 gallons per month of metal-bearing waste solution was originally generated and discharged to the sewer. After consulting with DEM's Pollution Prevention Section, the company found a cost-effective, non-chemical method for cleaning and recycling their tubing solution. The company bought and installed a Splitter ultrafiltration unit (manufactured by Infnitex of Buffalo, NY) to recycle the tubing solution. A zinc-rich sludge by-product of the ultrafiltration process is now sent off-site to a zinc supplier for reclamation.

Feedstock Materials

200-300 gallons per day (GPD) of process water.

40 gallons per month of Oakite Stripper M-3 tubing soap, manufactured by Oakite Products of Berkeley Heights, NJ.

Waste Releases

200 to 300 GPD of metal-bearing tubing solution discharged to the sewer.

Costs

100 to 150 GPD Splitter Ultrafiltration System, manufactured by Infnitex of Buffalo, NY.

Tanks, pumps, filters/housings

Total Capital Investment \$5,500

Operation \ Maintenance

Membrane replacement: \$300 per year

Savings

Annual savings in soap purchases: \$1,426

Annual savings in cartridge filters: \$789

Annual savings in process water: \$161

Annual savings in sewer fees and analytical testing: \$1,224

Payback Period

Approximately 1 year

Impact

The company no longer uses 62,500 gallons per year of water in its vibratory operation. The company has found that, by installing an ultrafiltration system, they were able to effectively "close loop" their vibratory process. In addition, ultrafiltration allows much of the tubbing soap to be recycled. By recycling the vibratory solution, the company has eliminated discharge to the sewer. Since no water is discharged to the sewer, compliance is not an issue.

In addition to eliminating discharge to the sewer, ultrafiltration creates far less sludge than chemical treatment. The other advantages of ultrafiltration are that operating costs are minimal and there are no hazardous chemicals involved. The company also found that the number of rejected parts in the production line decreased as a result of the modified process.