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POLLUTION PREVENTION
IN RHODE ISLAND

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

Jewelry Manufacturing
Cyanide

Jewelry manufacturer replaces cyanide cleaner with aqueous-based cleaner and implements ultrafiltration technology to recycle the cleaning fluid

Industry \ Contact
SIC Codes: 3961 Jewelry Manufacturer, Rhode Island.
Contact: Company #25

Technology Description
The company manufacturers rhinestone-set jewelry findings and finished jewelry. Average employment of the company is 800.

In 1989, a plant-wide pollution prevention steering committee was formed to provide oversight and guidance to pollution prevention project teams. Members of this committee included plant staff, RI DEM Pollution Prevention Section representatives, and the University of Rhode Island's Chemical Engineering Department. One of the first projects to be studied by the steering committee was a cyanide cleaning operation.

In a cleaning process for brass chain, a hazardous cyanide cleaner was originally used. Upon recommendation of the steering committee, the company began investigating alternatives to the cyanide cleaner. After a series of pilot tests, the company was able to replace the cyanide cleaner with Everclean, an aqueous cleaner (manufactured by Sellers Absorbent Materials of Milwaukee, WI).

In addition, an ultrafiltration unit was installed to recycle much of the soap, as well as to reject and concentrat the contaminants. A substantial reduction in waste from this process was observed in the first year.

Feedstock Materials
137 drums per year of cyanide cleaner

For more information, contact: RI Department of Environmental Management, Office of Technical and Customer Assistance, 235 Promenade Street, Providence, RI 02908 Phone: (401) 222-6822

Wastes
137 drums per year of spent cyanide cleaner

Costs
150 gallon-per-day Splitter ultrafiltration unit (manufactured by Infinitex of Buffalo, NY): $5,500

Operation \ Maintenance
Annual operation/maintenance costs: less than $1,000
Disposal costs: 4 drums per year of sludge, generated by ultrafiltration process

Feedstock Reductions
Annual feedstock savings: 137 drums per year of cyanide cleaner eliminated and replaced by 4 drums per year of Everclean biodegradable cleaner.

Treatment Disposal
Annual cost savings for cyanide cleaner transportation and off-site treatment: Data unavailable

Payback Period
Estimated to be less than 2 years

Impact
The company no longer purchases or uses 7,535 gallons per year of cyanide cleaner for the cleaning of brass chain. The company has found that Everclean biodegradable cleaner provides satisfactory results while eliminating the hazards involved with the cyanide solution.

In addition, the company is able to recycle much of the biodegradable cleaner with ultrafiltration while generating a relatively small amount of waste. The advantages of membrane technology are that no hazardous chemicals are used, soaps are recycled, water is conserved, and operating costs are low.