OhioEPA

Office of Pollution Prevention

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Governor's Pollution Prevention Award, 1997 Recipient

Leonhardt Plating Company

This company is one of the few companies that has used pollution prevention, creativity, and technology to obtain and maintain compliance: counter-current rinses and used rinse water for bath makeup, triple spill protection, DI systems, water reuse, rinse water timers and filters...

If most companies followed in the footsteps of Leonhardt Plating Company, the world would be a better place.

Michael Cappel
Industrial Investigator, Division of Industrial Waste
Metropolitan Sewer District, Cincinnati

The Governor's Awards for Outstanding Achievement in Pollution Prevention have been presented since 1986. Leonhardt Plating Company was one of seven recipients to receive the Award in 1997. These awards recognize outstanding commitments to improve Ohio's environment through pollution prevention. Evaluation criteria for the awards include: the reduction of waste at the source, recycling or recovery of materials, cost-effectiveness, ability of the program to serve as a model for others, and effectiveness in promoting pollution prevention as the preferred long-term approach.

Leonhardt Plating Company

Founded in 1950, Leonhardt Plating Company is a family owned and operated electroplating job-shop currently employing 22 people in Cincinnati and servicing over 100 customers. The company provides a variety of metal finishing services, including polishing, buffing, electroless nickel plating, nickel and chrome electroplating, and electroplating of stainless steel in a 20,000 square foot shop. Leonhardt's customers manufacture such items as medical furniture and equipment, store fixtures and displays, automotive accessories, plumbing fixtures, food processing machinery, machine tools and others.

Pollution Prevention Activities

In 1993, the first duty the operator performed each morning was to turn on all the water in the plant. All rinses continued to flow all day until quitting time. The operator would close the main valve as the last duty of the day. Over a five year period, through a program of water and raw material conservation, Leonhardt Plating dramatically reduced its water usage and embarked on a permanent pollution prevention program. A daily log is kept recording pH, temperature, volume, start and stop time of each discharge, and the name of the operator. Water usage was reduced from approximately 23,000 gallons per day in

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1993, to approximately 3,000 gallons a day currently, saving about $5,000 annually. This allowed Leonhardt to be permitted as a batch discharge water user instead of a continuous flow user, saving $10,000 annually in monitoring fees. In June 1993, Leonhardt began working with the Institute of Advanced Manufacturing Sciences (IAMS) to reduce wastewater generation and make the plating process more efficient. Leonhardt's use of chrome decreased from 700 pounds annually to 400 pounds for the same amount of output. In 1995, Leonhardt installed a new, closed-loop electropolish process that pipes rinse water through a heavy metal exchange cylinder and reuses it in the process. Leonhardt has also initiated a company-wide waste minimization program to address disposal expenses, liability concerns and recovery/recycling issues.

Installation of Water Timer

The amount of water needed is dependent on the number of parts run, and times of the run. A water timer and solenoid valve were installed to deliver a fixed quantity of water to each rinse tank. An indoor sprinkler system is used to feed water to the plating rinses at critical times to ensure quality rinsing. Water lines were piped to a central location connecting the feed for each cleaning line. A solenoid valve was installed at the beginning of each line, and wired to the water timer. This allowed a controlled amount of water during each of the five plating rinses. Now, any line can be turned off or on as needed.

Rinse Tank Updated

The amount of water needed to keep a rinse tank clean is a function of the size of the tank, which is a function of the size of the parts run. Examination of the size and condition of each tank revealed that most tanks needed repair. They were replaced with the smallest possible tanks that could accommodate the size of the parts. New tanks are made of polypropylene or fiberglass and are required to have weirs that capture floating solids or oils. A stave rinse after the chrome tank was converted to a spray rinse. The chrome is collected in the tank and added back to the chrome plating tank, saving 200 pounds of chrome per year.

Reduction in Number of Rinse Tanks

Leonhardt analyzed tank layout and decided that two rinses following the acid tank use were not necessary. One rinse was removed with no noticeable change in the quality of rinsing. This eliminated three flowing rinses and saved $3,000 in water costs annually.

Counterflow Rinses

The production process requires rinsing at several stages. The soak rinse is the dirtiest and requires the most water. The electroclean and acid rinse water are fairly clean. Leonhardt decided to reuse this water in the soak rinse. Wastewater from these rinses overflow into a sump barrel and is pumped back to be reused in the soak rinse, doubling the flow in the dirtiest tank without using additional fresh water.

Redesign Hot Water Rinse

A flowing hot water rinse follows the closed-loop chrome rinse tanks. Leonhardt combines the chrome rinse water into the final hot water rinse. The final chrome rinse is piped through a heavy metal exchange cylinder to remove heavy metals from the water. It is then piped into the hot water heater where it is heated and run into the final rinse. This is a closed loop process and none of the final rinse is discharged into the sewer.

Repipe of Wastewater Collection

Piping wastewater directly into a collection sump for each line allows easy testing for pH in wastewater discharge of each plating line, helping to determine if there is a problem and where it might be.

Environmental Benefits

Over last five years, business has doubled for Leonhardt. In that context, Leonhardt has reduced

wastewater generation 23,000 gallons per day to 3,000. By capturing all wastewater in a batch tank, potential spill discharge into the sewer can be avoided. The addition of the chrome spray rinse has reduced chrome wastes by 300 pounds annually.

Health and Safety Benefits

Leonhardt employees work in a safer place because of the reduction of wastewater flows. Wastewater is now piped under the floor instead of running in an open trough. The community is safer because the valve for the wastewater is only opened one time during the day. This prevents accidental discharges into the sewer. The change to a batch discharge permit reduced the regulatory burden on the Cincinnati Metropolitan Sewer District.

Economic Benefits

While Leonhardt's sales have increased dramatically, their costs have decreased. Costs for water usage have decreased by approximately $5,000 annually. More efficient processes have resulted in fewer raw material purchases. As a result of their reclassification as a lower volume water user, they anticipate an immediate cost saving of $10,000 due to decreased monitoring fees. The long term cost savings will boost the company's growth and long term competitiveness. The company's liability has been reduced and their image has been enhanced as more socially and environmentally responsible. This has helped keep and attract environmentally conscious customers.

Management Commitment

Pollution prevention is promoted in Leonhardt Plating's Environmental Mission Statement. Every employee is given the Environmental Mission Statement and trained on water conservation and waste minimization. Leonhardt is committed to protecting its employees and community by exploring new ideas and practices in pollution prevention. Because of their successful recycling and pollution reduction programs, the International Visitors Council of Greater Cincinnati chose Leonhardt as a tour site for a group from Africa touring the United States focusing on environmental protection issues. Leonhardt is proud of their effort to provide a legacy of a cleaner environment for future generations.

Transferability

Leonhardt believes these efforts are transferable to other industrial water users. They have given three presentations to share their experience and results with others in industry including the IAMS Waste Reduction Seminar in October 1995, the Southwest Ohio Water Environment Association Industrial Waste Seminar in January 1997, and the 6th Annual Business and Industry's Environmental Symposium in April 1997. These projects were featured in the Cincinnati Post and the Cincinnati Enquirer. Leonhardt has also submitted articles to national trade journals.

For More Information

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This is one in a series of documents Ohio EPA has prepared on pollution prevention. For more information, call the Office of Pollution Prevention at (614) 644-3469.

The Office of Pollution Prevention was created to encourage multi-media pollution prevention activities in Ohio to reduce risk to public health, safety, welfare and the environment. Pollution prevention stresses source reduction and, secondarily, environmentally sound recycling while avoiding cross media transfers. The Office analyzes, develops, and publicizes information related to pollution prevention and increases awareness of pollution prevention opportunities via education, outreach, and technical assistance programs for business, government, and the public.

Office of Pollution Prevention WWW address: www.epa.state.oh.us/opp