Technical Assistance *Revisited*

Lightolier, A Division Of Genlyte

Elimination of Trichloroethylene and Reduction of VOC Emissions

The Massachusetts Office of Technical Assistance and Technology (OTA) offers assistance in reducing the use of toxic materials, improving environmental performance and promoting economic growth. The Technical Assistance Revisited case studies are the result of an effort to measure the effectiveness of the Commonwealth's program of helping companies to reduce toxics use through onsite visits.

Summary

Lightolier has eliminated the use of approximately 1.25 million pounds of Trichloroethylene at their Fall River, Massachusetts plant. The company found less toxic alternatives and modified their production process, which eliminated more than 4 million pounds of air emissions, with savings of more than $2 million.

Background

Lightolier is a national company with a plant in Fall River, that has 425 employees. They fabricate aluminum reflectors for Lightolier's track and recessed lighting product lines. The Fall River plant has been implementing toxics use reduction since the late 1980's, in response to corporate environmental objectives, with the help of the Commonwealth's pollution prevention assistance initiative.

Powder Coated Reflectors

Toxics Use Reduction

In 1989, Lightolier staff attended a series of workshops held in southeastern Massachusetts by the Office of Safe Waste Management (OSWM), now called the Office of Technical Assistance and Technology (OTA). The workshops explored the options that electroplaters and metal finishers might have for reducing the use of toxics in their process, including the many different ways that parts could be cleaned, rinsed, chemically treated, and coated. Lightolier staff later told OTA that the workshops helped them to consider alternatives and understand the costs of not changing their practices.

Following the workshops, OSWM staff visited the company and recommended increasing drip time to allow acidic chemicals to return to the chemical bath when the parts were removed. This conserved raw material use, minimized the acidity of the rinsewaters, and reduced their use of wastewater pH adjusting chemicals. OSWM also recommended that the company install still-rinse tanks and use countercurrent rinsing to reduce water usage. Lightolier installed the still-rinse tanks, implemented countercurrent rinsing, and increased the drip time to reduce acid discharges.

From 1990—1994, Lightolier was using an average of about 125,000 pounds of Trichloroethylene (TCE) and large amounts of acids annually. Only 10 percent of the TCE was captured for recycling – the rest resulted in fugitive emissions. The company was experimenting with aqueous alternatives to TCE but had not located a reasonably priced substitute. OTA suggested looking at hidden costs such as liability, worker safety, and opportunities for increased productivity. Following this advice, Lightolier found that ten percent of one employee's time was spent monitoring the TCE degreasers and manifesting the used TCE that was sent to a recycler, a week's worth of labor was dedicated to EPCRA reporting for TCE, and 40 percent of the time spent on Right-to-Know training was strictly for TCE.

Lightolier's Fixture Assembly Area

The TCE degreasers were old and would require increasing maintenance and replacement in the near future. The analysis of hidden costs showed that it was worthwhile to invest resources in eliminating TCE instead of keeping and maintaining the old degreasers. The company replaced

the two degreasers with an aqueous degreaser and a powder coater/degreaser. Then they switched from pure petroleum lubricants to water-soluble coolants which eliminated the generation of oily parts, allowing the use of safer cleaners and also eliminating TCE at the source of the problem. With the new powder coater/degreaser, Lightolier began using electrostatic powder coating, to substitute for solvent-based coating in some applications, which further reduced VOC emissions. All of these changes were easily justifiable when a full cost analysis was performed.

In 1997, their local sewage treatment authority was proposing to lower the limit on allowable copper discharges. Lightolier examined their input chemicals and identified a brightener with a high copper content. Using an idea promoted by OTA, the company asked its supplier if the copper content could simply be reduced. Lightolier found that an alternative brightener had one tenth the amount of copper and worked just as well as the product they had been using. The company's discharges were now far below the proposed discharge limits.

Typical Process tanks in one of Lightolier's State of the Art Automated Anodizing Lines

Results

Since removing their two vapor degreasers, installing the still-rinse tanks, implementing countercurrent rinsing, and increasing the drip time to reduce acid discharges, the company has eliminated approximately 1.25 million pounds of TCE and saved an estimated $170,000 per year. VOC emissions at the company went from an average of 125,000 pounds per year to just about 12,000 pounds per year, a 95% reduction, and their air compliance costs have become minimal. In the mid-1990's, the company agreed to serve as a case study on the benefits of conducting full cost assessment, and their example has been used to educate Toxics Use Reduction Planners and other interested parties ever since.

Technical Assistance Impact

Lightolier continues to seek toxics use reduction opportunities; as a result of their ongoing efforts, production line employees recently came up with suggestions for using less buffing compounds, which enabled the elimination of a terpene cleaner that was one of the replacements for TCE. While switching to terpene had been a great improvement from TCE, it had created a persistent odor, and workplace conditions have improved since it was eliminated. Although the company had switched to powder coating for some applications, they still perform some wet coating. For these instances, they use paints with lower VOC content, further reducing air emissions. The company also found alternative uses for its waste brightener, which contains valuable phosphoric acid. This eliminated the need to neutralize about a half-million pounds of the phosphoric acid and purchase sodium hydroxide to neutralize before discharge, which both increased safety and saved the company about $50,000 a year. The company went from being a large quantity generator to a small quantity generator of hazardous waste, which generated additional savings from compliance costs.

Company Quote

Lightolier's Ron Westgate credits the state's assistance effort with teaching him a useful philosophy that has been of great help to his company. "Nothing is less productive than to make more efficient what shouldn't be done at all. What if you don't need that tank?" Lightolier is continuing to work with OTA, now focusing on renewable energy and resource conservation planning.

The Office of Technical Assistance and Technology (OTA) offers onsite assistance that is available to toxics users in Massachusetts. OTA staff are trained specialists in toxics use reduction and environmental compliance. They have many years of experience in working with all forms of industrial production, as well as other facilities where toxics are used. For more information about OTA please visit: http://www.mass.gov/envir/ota or call 617-626-1060.