EXECUTIVE OFFICE of ENVIRONMENTAL AFFAIRS

Commonwealth of Massachusetts
Executive Office of Environmental Affairs
Office of Technical Assistance (OTA)

December 2001

Inner-Tite Corporation Toxics Use Reduction Case Study

Closed-Circuit Degreaser and Other Changes Improve Environmental, Health and Safety

Summary

Inner-Tite Corporation replaced its existing parts degreasing equipment with two entirely enclosed Forenta® degreasing units. The new degreasing equipment has reduced air emissions of trichloroethylene (TCE) by 97% and will save the company over $12,000 annually in avoided chemical purchases.

Background

Inner-Tite specializes in the manufacture of anti-theft devices used by electric, gas and water utilities to secure meters, cables, pipes and other equipment (see right). The company maintains a staff of approximately 85 employees at its Holden, MA facility, which it has occupied since 1987.

In 1993, Inner-Tite sought to reduce air emissions and worker exposure levels to the methylene chloride used in the degreasing process. They contacted the Massachusetts Office of Technical Assistance (OTA) for a site visit and recommendations. OTA encouraged Inner-Tite to investigate alternatives to methylene chloride and to contact the Massachusetts Occupational Safety and Health Administration (OSHA) Consultation Program[1] for specific guidance on their employee health and safety issues.

Over the next several years, Inner-Tite instituted a number of design changes, including the replacement of methylene chloride with trichloroethylene (TCE), which achieved reductions in air emissions and worker exposure levels. Despite the host of environmental, health, and safety upgrades made throughout the facility, Inner-Tite was still unsatisfied with the level of air emissions and costs they represented in the form of chemical purchases, regulatory reporting and monitoring, and impact these emissions had on working conditions.

The company researched a number of less hazardous alternatives to TCE with the help of vendors, the Toxics Use Reduction Institute (TURI), and OTA. Although aqueous cleaners were the most likely substitute, the environmental staff was unable to find a water-based product that cleaned as well and as

[1] A non-regulatory health & safety assistance program, similar in nature to OTA, administered by the Massachusetts Division of Occupational Safety.

quickly as TCE. Inner-Tite was also reluctant to assume the wastewater management responsibilities posed by aqueous cleaning products.

Toxics Use Reduction

Inner-Tite chose to replace its degreasing equipment with a new technology adapted from the dry cleaning industry (see left). Manufactured by Forenta, the unit's design and operation are similar to that of a washing machine. Workers load bins of parts into the wash bay, then close and seal the door. The 13-minute cleaning cycle is entirely automated and a sensor prevents the wash bay door from being opened again until the drying period is completed.

A charge of TCE is piped directly into the unit where it is re-circulated and used for a period of several months. A built-in still recovers used solvent and cycles it back into the system. The contaminants are piped to a drum for disposal. Stabilizers are used to maintain a correct pH until the TCE becomes too acidic and must be replaced. Although the initial charge of TCE was changed after six months, Inner-Tite believes they will be able to achieve a much longer TCE lifespan by improving the operating procedures.

Some training was required to orient employees to the operation of the new unit and the start-up and shutdown procedures. The high level of automation, as well as a number of safeguards such as a sensor that prevents opening until the drying cycle is complete, ensures minimal employee exposure to TCE.

Results

Emissions: Inner-Tite replaced their existing degreasing equipment with two Forenta degreasing units and by doing so cut the annual TCE air emissions from 24,000 lbs to 723 lbs. TCE concentrations at the point of operation, due to carry out as parts trays are exchanged, have been measured at no more than 3 ppm (the OSHA standard for TCE is 100 ppm). The new degreasing units also help improve working conditions at the facility, complementing several other health and safety upgrades Inner-Tite has made based on recommendations from the Commonwealth's OSHA On-Site Consultation Program and OTA staff.

Economics: As the first company in the United States to install the Forenta degreasing technology, Inner-Tite elected to purchase two units as a precautionary measure. Because the units re-circulate TCE and generate very few air emissions, the company used a total of 219 gallons of TCE for both units this year, down from approximately 2000 gallons per year with the old system. At $7 per gallon, this represents an annual savings of over $12,000. The elimination of substantial air emissions also eliminates air quality approval and associated fees. The short cleaning cycle has allowed the company to maintain a high level of production.

This case study is one in a series prepared by the Office of Technical Assistance (OTA), a branch of the Massachusetts Executive Office of Environmental Affairs. OTA's mission is to assist Massachusetts facilities with reducing their use of toxic chemicals and/or the generation of toxic manufacturing byproducts. Mention of any particular equipment or proprietary technology does not represent an endorsement of these products by the Commonwealth of Massachusetts. This information is available in alternate formats upon request. OTA's **nonregulatory** services are available at **no charge** to Massachusetts businesses and institutions that use toxics. For further information about this or other case studies, or about OTA's technical assistance services, contact:

Office of Technical Assistance, 251 Causeway Street, Suite 900, Boston, MA 02114-2136
Phone: (617) 626-1060 Fax: (617) 626-1095 Website: http://www.state.ma.us/ota