

February 1999  
Number 65***Governor's Pollution Prevention Award, 1998 Recipient***  
**ALCOA Building Products, Inc.**

***ALCOA Building Products, Inc. is being recognized for:***

◆ ***elimination of 230,000 pounds of glycol ethers/ ethylene glycol releases,***

◆ ***elimination of chrome use in conversion coating,***

◆ ***elimination of MEK use as a cleaning solvent, and***

◆ ***reduction of 42 million gallons of wastewater discharge.***

The Governor's Awards for Outstanding Achievement in Pollution Prevention have been presented since 1986. ALCOA Building Products, Inc. was one of seven recipients to receive the Award in 1998. 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 for environmental management.

**ALCOA Building Products Inc.**

ALCOA Building Products, Inc. (ALCOA), a wholly owned subsidiary of The Aluminum Company of America, is located in Sidney, Ohio. ALCOA coats and fabricates aluminum and steel building products and employs approximately 400 people. ALCOA products are used in residential remodeling and new construction. Their building products include siding, gutter, gutter coil, trim sheet coil, soffit, and accessories.

**Pollution Prevention Activities**

ALCOA made outstanding progress in pollution prevention through a planned management effort. Employee involvement, employee training, communicated and supported Environmental, Health and Safety (EHS) policy, values, and principles, and quantifiable reduction goals are all tools used by the facility for pollution prevention activities. ALCOA used a proactive approach to eliminate toxic raw materials, and made



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significant gains in pollution prevention while minimizing costs and maintaining production levels. The company eliminated 230,000 pounds of releases per year of ethylene glycol. It implemented a non-chrome Dried-in-Place process that has reduced the amount of chrome sent to the city's wastewater treatment plant by 89 percent. From 1995 to 1997, ALCOA reduced water discharge to the city's waste water treatment plant by 85 percent. This reduces the volume of water the City of Sidney must treat and discharge to the Great Miami River by 42 million gallons per year. During the same time frame, ALCOA reduced landfilled solid waste by 48 percent. In addition, the company reduced hazardous waste generation from water-based paint cleanups by 428,000 gallons per year. This is an 84 percent reduction.

## **Elimination of Glycol Ethers and Ethylene Glycols**

Source elimination was the first choice for the glycol ethers/ethylene glycol reduction method. Working with their coating suppliers, ALCOA switched many of the incoming primers and topcoats to those with less hazardous components. In requiring glycol ethers/ethylene glycol free coatings, ALCOA was the catalyst for the suppliers to establish new stocks of the less hazardous solvents for formula-

tion in their coatings. Without capital expenditures or added operating cost, 230,000 pounds of releases per year of glycol ethers/ethylene glycol have been eliminated.

## **Elimination of Chrome**

Aluminum is commonly conversion coated prior to painting to provide important paint adhesion characteristics. Conventional conversion coating places a chrome oxide layer on the surface of the metal prior to coating. Conventional conversion coating is done in dip tanks to ease application and control.

In response to new wastewater effluent guidelines in 1986, ALCOA investigated new conversion coating technology. ALCOA converted to a Dried-in-Place conversion coating technology. Dried-in-Place technology applies the conversion coating chemicals without conventional dip tanks and overflow rinses. The process utilized a chrome phosphate without cyanide solution and eliminated the overflow rinses. Installation of the process system eliminated the need for a conventional waste water treatment system and the resulting residual waste water metals and hazardous waste generation. The Dried-in-Place process was changed to chrome-free chemicals in 1993. This final step eliminated chrome discharges from the pretreatment process.

The current non-chrome process resulted in a 89 percent reduction in chrome sent to the City of Sidney Publicly Owned Treatment Works (POTW). By switching to this process, costs associated with the purchase and ongoing operation of a wastewater treatment system have been avoided. Additionally, millions of dollars have been saved by avoiding the hazardous waste disposal costs.

## **Elimination of MEK**

Use of methyl ethyl ketone (MEK) for change overs and as a cleanup material was ALCOA's standard practice. Due to environmental concerns, ALCOA sought reduction through elimination of MEK. The facility identified three different water based materials that, when combined, served as a replacement for MEK. After successful trials of the water based materials, all MEK has been eliminated from use during changeover and cleanup process. The elimination of MEK reduced the facility's Hazardous Air Pollutant emissions by 128,000 pounds.

## **Elimination of Naphtha Lubricant Emissions**

Prior to 1995, a lubricant containing a high percentage of naphtha was used for lubrication and cooling in the roll forming operation. Naphtha is a VOC containing ethylbenzene and xylene. The process required the lubricant to flash off, leaving no residual on the

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product without any washing operations. Through a joint product development process between ALCOA and several potential new suppliers, a water based lubricant was developed that could meet the lubricating and cooling needs of the process, did not leave a residue, and did not require secondary cleaning operations. A new application method for applying the lubricant was also developed and implemented to improve effectiveness. The concentrated water based product is diluted with water at the plant. The new lubricant and application technology reduced both the volume and toxicity of emissions.

The material substitution has dropped annual VOC emissions from these operations from 121,800 pounds per year to 180 pounds per year for a 99.8 percent VOC reduction. Because the replacement lubricant is 97.5 percent water, the switch to the water based lubricant also saves \$26,000 annually. The facility was spending \$28,000 per year on naphtha. Currently, costs include \$2,000 per year for the water based concentrate and \$30 per year for the water.

## Reformulation of Coatings

ALCOA has actively worked with suppliers to develop new pigments to replace chrome. All new substances that are introduced at ALCOA are reviewed for hazardous chemi-

cal constituents prior to being brought on-site. Any new coating containing chrome as a pigment is generally reviewed with the supplier for alternative pigments before being accepted.

## Other Projects

**Process Water Use Redesign Activities** A wastewater reduction program was successfully initiated in 1994. Process water reduction projects included controlling tank overflow volumes, closer monitoring of chemical additions, cleaner tank counterflow, and tank level controls. In some areas where water reduction was not possible, water filtration systems were used to clean and recycle water.

From 1995 through 1997, water discharge to the City of Sidney POTW has decreased from an average of 155,000 gallons per day to 23,000 gallons per day. The 132,000 gallon per day water reduction is a 85 percent reduction. This has reduced the volume of water that the City of Sidney must treat and discharge to the Great Miami River by 42 million gallons per year.

**Wood Pallet Recycling** Pallets are returned to the sender. If damaged, the pallets are repaired and used again. If the pallets are unuseable, they are distributed to the employees to use as firewood. These methods eliminated the landfilling of any pallets.

## Paint Changeover Process Redesign to Minimize Hazardous Waste Generation

Hazardous waste is primarily generated at the facility by color and coating system changes on the coil coating lines. ALCOA employed a systematic approach to reduce both changeover downtimes and waste generation. The changes employed included minor modifications to existing equipment, fabrication and use of special tools to collect paint waste, reuse of waste coating material in other processes, improved scheduling, and minimization of dilution water used as cleanup material.

## Environmental Benefits

Pollution prevention projects have protected the environment by the reduction of glycol ether by 39 percent from 110,000 pounds per year to 70,000 per year. Ethylene glycol releases of 190,000 pounds were eliminated. MEK cleanup consumption has been eliminated from 215,800 pounds. The elimination of MEK reduced the facility's Hazardous Air Pollutant emissions by 128,000 pounds. Roll forming lubricant material substitution has dropped annual Naphtha VOC emissions from 121,800 pounds per year to 180 pounds per year, a 99.8 percent reduction. The current non-chrome Dried-in-Place process has reduced chrome sent to City of Sidney's POTW by 0.36 pounds per day, an 89 percent reduction. Water discharge to the City of Sidney

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POTW has decreased from 155,000 gallons per day to 23,000 gallons per day for an 85 percent reduction. This has reduced the volume of water that the City of Sidney must treat and discharge to the Great Miami River by 42 million gallons per year. Hazardous waste generation from water based paint cleanups of 428,000 gallons per year have been avoided and a 84 percent reduction has been realized.

## **Health and Safety Benefits**

Pollution prevention projects have improved the health and safety conditions for ALCOA's employees by reducing exposure to glycol ethers, ethylene glycol, MEK, naphtha, and chrome. The State of Ohio benefited from reduced use of the City of Sidney's POTW and reduced

exposure to the community to air and water releases.

## **Management Commitment**

ALCOA operates under a very strong EHS programs. The EHS programs have been developed to be visible to the employees. Pollution prevention is a fundamental and integral portion of these EHS programs. In addition to the formal pollution prevention activities, elimination of all types of waste is a priority of the location's manufacturing systems.

ALCOA promotes and supports both pollution prevention and sustainable development through corporate policies and resources and tri-annual environmental systems audits.

All employees were given an eight hour environmental

awareness training course focusing on pollution prevention topics. The facility developed an employee suggestion system as a tool to solicit pollution prevention feedback from all employees.

## **Transferability**

The facility has influenced other manufacturers through education and cooperation with suppliers. Many of the changes initiated by ALCOA have been transferred to other manufacturers through the suppliers.

## **For More Information**

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**This is one in a series of documents Ohio EPA has prepared to promote pollution prevention activities in Ohio and integrate pollution prevention into Ohio EPA programs. For more information, call the Office of Pollution Prevention at (614) 644-3469.**

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*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, as a second choice, environmentally sound recycling while avoiding cross media transfers. The Office develops information related to pollution prevention, increases awareness of pollution prevention opportunities, and can offer technical assistance to business, government, and the public.*

**Office of Pollution Prevention WWW address: [www.epa.state.oh.us/opp](http://www.epa.state.oh.us/opp)**