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Governor's Pollution Prevention Award, 1997 Recipient **Ashland Chemical Company** **Foundry Products Division**



Ashland Chemical is being recognized for:

- ◆ *forming a team to find all sources of waste and creating ways to reduce waste from customer returns, minitank washouts, spoilage, and contamination and production errors*
- ◆ *reducing overall waste by 15% over a time when production was increasing by 30%*
- ◆ *reducing disposal costs by some \$36,000 or 40% per pound of production*
- ◆ *saving \$12,000 by using reworked materials that would have been disposed of, and*
- ◆ *shipping over 200,000 pounds of water-based scrap materials to a cement manufacturer as an alternative raw material, saving about \$8700 in disposal costs*

The Governor's Awards for Outstanding Achievement in Pollution Prevention have been presented since 1986. Ashland Chemical Company Foundry Products Division, Cleveland East Plant 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.

Ashland Chemical Company

Ashland Chemical Company's Foundry Products Division is the world's largest supplier of foundry chemicals. The Cleveland East plant manufactures coatings and specialty chemicals for the foundry industry. Cleveland East has approximately forty employees.

Pollution Prevention Activities

In 1995, Ashland Chemical Company's Foundry Products Division, Cleveland East facility (Ashland Chemical) generated approximately 600,000 pounds of industrial waste called "waste paste." To explore options for pollution prevention and waste reduction, a multi-disciplinary waste reduction team was formed with representatives from product applications, research and development, production and quality control. The team's first goal was to determine all the sources of waste generated at the plant. They then set a waste reduction goal in terms of cost per pound of production. They established a target of \$0.0025 per pound. The team identified the sources of waste as customer returns, minitank washouts, spoilage, and contamination and production errors.



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Minimizing Customer Returns

Nearly 25% of scrap generation was due to customer returns.

Five reasons account for nearly 80% of all returns. Contamination (34%), settling/separation (23%), quality complaints (11%), old stock (11%), and formulation changes (10%). Problems were addressed based on specific customer concerns, such as improving the formulation of a specific product to eliminate graphite flotation.

Minitank Washout

Material left in minitanks when returned by customers accounted for 12% of waste generated. Some residue left in the minitanks is expected but, some customers returned tanks with large amounts of material remaining, up to 1000 pounds. These returns accounted for the bulk of minitank washout. The team discovered that many customer contracts included a charge for cleaning dirty tanks when returned. With the help of the Sales Department, Ashland Chemical encourages customers to limit the amount of residual material returned to the plant.

Contamination Elimination

Contamination, which accounted for 12.3% of the facility's waste, was primarily caused by magnesium oxide. The system for delivering magnesium oxide into the process used a bucket elevator that was also used for other raw materials. The other materials were being contaminated by the magnesium oxide.

Manufacturing processes were changed so the magnesium oxide could be delivered directly into the mixing vessel, preventing contamination.

Rework/Spoilage Improvements

Used material was seldom reworked and became waste due to spoilage and degradation if not blended off (treated for reuse) in a timely way. The team developed a flowchart of the process to help plan a way to get rework materials back into the processes. The plan the team created included;

- ◆ updating rework procedures in the Plant Operations Manual,
- ◆ distributing weekly inventory updates to raise awareness of the materials to blend off,
- ◆ determining blend off rates for rework materials,
- ◆ separating scrap and rework materials to speed the process,
- ◆ creating an inventory system for rework material including a schedule board of batches to have rework added to them, and
- ◆ adding pipes to mixing vessels using existing pumps to simplify adding rework to batches.

Improved Manufacturing Procedures

The existing manual of manufacturing procedures was cramped, difficult to read, and did not

provide a space for operator notes. The procedure also lacked a formal way to report the production problems. The team sought input from operators and had procedures reviewed by product managers before the procedures were updated. The new procedures were put into a new format that separated the manufacturing process into step-by-step instructions. Provisions were made to allow operators to record the lot numbers and weights of raw materials used in production and facilitate feedback from Production to Research and Development.

Waste Paste Minimization

The team found a cement company to use their water based scrap as raw material. Several steps were taken to set up the recycling process. The cement company had to be approved as a waste handler and determine which waste materials it could use. Possible trucking problems due to the viscosity of the material had to be addressed. These obstacles were overcome and Ashland recycled over 200,000 pounds of material.

Environmental Benefits

The team's results were tracked and compared to its goals for waste generation, material disposal, and material rework and recycling.

- ◆ An inventory tracking system verified that over 285,000

Ashland Chemical Company, Foundry Products Division

pounds of rework materials were blended off into production batches.

- ◆ 200,000 pounds of water based scrap materials were recycled at the cement company.

- ◆ Total disposal of waste was reduced by nearly 100,000 pounds from 1995 to 1996.

- ◆ The companies which returned the two greatest amounts of material in 1995, returned none in 1996.

- ◆ There were no reports of magnesium oxide contamination due to the changes in handling.

Economic Benefits

In 1996, disposal costs at the Cleveland East plant were reduced by \$15,000 or 40%. This meant that the team met its goal of keeping waste costs to \$0.0025 per pound of production (\$0.00181 per pound).

Reworking material saved disposal costs of \$12,000 and 140 hours labor for disposal saving \$2000.

Recycling 200,000 pounds of material with a cement manufacturer saved \$8700 in disposal costs.

Health and Safety Benefits

Although handling waste paste does not present substantial health or safety risks, its reduc-

tion results in less exposure for Ashland's customers and employees. Removal of this waste stream from landfills also reduces potential future exposure and environmental impact.

Management Commitment

The policy of Ashland Inc., its subsidiaries and divisions is to promote pollution prevention and waste minimization and share responsibility to protect the environment. Ashland's written policy includes:

- ◆ Waste Minimization: The waste minimization policy of Ashland Chemical Company is to achieve reduction in waste generation and its release to the air, water, and land through minimization, recovery, recycling and/or reuse or treatment of waste materials and by-products.

- ◆ Waste minimization is the reduction in quantity or toxicity of all materials that do not end up in the final product which result from Ashland Chemical operations. This includes discharges to the air and water, and on-site and off-site treatment or disposal operations, *and is irrespective of permitted discharge limits and facility production rates.*

An active member of the Chemical Manufacturers Association, Ashland Chemical adheres to work practices outlined in the Responsible Care initiative. This represents a commitment to continuously improve commu-

nity outreach and environmental, health and safety performance by minimizing waste, reducing emissions and providing value-added environmental services and assistance to customers. Ashland Chemical augmented their participation with its own Responsible Care Policy:

- ◆ Ashland Chemical is an active responsible member of the community in which we operate. We obey all laws and regulations governing our operations and work in a manner that ensures the safety of our employees, our communities and our environment.

- ◆ A fundamental operating principle of Ashland Chemical is that all injuries, occupational illnesses and environmental harm can be prevented.

- ◆ Management is responsible for providing the necessary training, equipment and systems to ensure a safe operating environment. Prevention of injuries, occupational illnesses and protection of the environment are primary responsibilities, which are accepted by every employee throughout the entire Ashland Chemical organization.

- ◆ Ashland Chemical will not make or sell any material that cannot be produced, transported, used and disposed of safely.

Employee Involvement

Ashland Inc. created the President's challenge to pro-

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mote and recognize environmental protection efforts, healthy life-styles, and safe work practices. Recipients can be operating groups, employees, retirees, or family members who make contributions to a cleaner environment, safer working conditions, and improved quality of life. Recipients are named in five categories: Product Stewardship and Pollution Prevention, Conservation and Habitat Enhancement, Wellness and Health, Safety, and Distinctive Achievement. Ashland Chemical has a Quality Plus Recognition Program that promotes team involvement in improving any problem area within business practices including pollution prevention. The Program has five core steps in solving problems: Defining the Problem, Determining the

Causes, Developing Solutions, and Verifying Improvements. Model projects are reviewed and exceptional efforts are recognized and shared with other employees during the Quality Plus Recognition Day.

Transferability

As a member of the Chemical Manufacturers Association, Ashland Chemical shares successes and technical information with customers and suppliers, the community, and other chemical companies. U.S. EPA has published three of Ashland's pollution prevention project summaries as success stories in the 33/50 Program.

Ohio Prevention First

Ashland Chemical is an active participant in the *Ohio Prevention*

First initiative. *Ohio Prevention First* is a voluntary planning initiative to reduce pollution generated throughout Ohio. This provides an important opportunity for business and industry to take a leadership role in environmental protection without additional regulatory demands. Ashland Chemical's four manufacturing facilities in Ohio participate at the Leadership level and three distribution facilities participate at the Partnership level.

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