

A Cooperative Project  
between the  
U.S. Environmental  
Protection Agency  
and the  
Printing Trade  
Associations  
Nationwide

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# design<sup>FOR</sup> THE ENVIRONMENT

LITHOGRAPHY PROJECT CASE STUDY 2

## BULLETIN HIGHLIGHTS

- Consolidating Chemicals
- Evaluating Fixed Costs
- Reducing Wasted Ink

## ALSO IN THIS BULLETIN

- How to do a Process Evaluation
- How to Find New Pollution Prevention Opportunities



## Pollution Prevention at Custom Print

This case study highlights the pollution prevention activities of one print shop. This company's experience shows how making a real effort to prevent pollution in all parts of printing operations can save money, benefit the environment, and result in a safer workplace. Specifically, we show:

- how **constant attention** to pollution prevention can save money while reducing the environmental impact of your business.
- how **teamwork** among employees, vendors, and chemical suppliers can lead to successful prevention.
- how **looking at the big picture**, not just at meeting regulations and cleaning up spills, can point out more ways to prevent pollution.

To improve worker health and safety, as well as the environment, many companies have started creative programs to look for more prevention opportunities. One such company is **Custom Print Corporation** in Arlington, Virginia. Custom Print employees have found that starting with a "process evaluation" is one of the best ways to find new prevention methods. A process evaluation is a step-by-step review of your printing process. To conduct such a review, follow these steps:

- Take a critical look at each step of your printing process, from purchasing raw materials to shipping finished product.
- Draw a diagram of the process and mark down every point where materials are used and where wastes are generated.
- Remember to include the steps in your operation that are not directly part of the production process (such as waste disposal and electricity use).
- Where wastes are generated, estimate the cost associated with lost raw material, and with collecting, tracking and disposing of the wastes.

When your diagram is done, take a closer look at the points where wastes are produced. There may be ways to reduce each of these wastes. Remember, wastes indicate lost profit as well as possible environmental problems.

## Company Background

Custom Print is a sheetfed, offset lithographic printer of commercial color products including brochures, folders, and booklets. With one 40" 5/C presses, two 40" 2/C presses, and an 11"x17" 2/C press, the 22 year-old company employs 30 people and realizes \$4 million in annual sales. Custom Print has found that its efforts to prevent pollution have made it a cleaner and safer workplace and have resulted in cost savings.

Custom Print started its pollution prevention program more than 8 years ago. The program's initial successes led management to look for even more ways to prevent pollution. Today, the company is recognized as a pioneer. Many of its pollution prevention methods are now becoming common in the printing industry.



## Preventing Pollution through Chemical Consolidation

As Custom Print started looking for ways to reduce its waste, a team of employees took stock of the number of chemicals the company used. Inventory and purchasing records showed over 80 different chemicals on-site. Often, the less frequently used products would expire. The money spent on them was wasted, and by law they had to be properly disposed of — another expense. Many more were product samples, often used once and left to clutter the stockroom until they too passed their expiration dates. In addition, the large inventory created extra labor costs. Employees had to order and track each chemical, and ensure compliance with government regulations.

To address these problems, Custom Print assembled a team of press operators, purchasing staff, and maintenance personnel. This team not only looked at the causes of the large inventory, they recommended several ways to reduce it. The solutions they found included:

- 1** Use multi-task chemicals. Working with their suppliers, the team identified chemicals that can be used for more than one task. Using these products reduced the stock of infrequently used chemicals and of expired chemicals.
- 2** Eliminate duplication. The team found that in some cases two or three different chemicals were being bought for the same task. To eliminate this duplication, employees who used similar chemicals got together and reviewed all products in use. As a team, they selected only one chemical for each task.
- 3** Give unused samples back to the vendors. Custom Print asked vendors to pick up their unused or partly used samples each time they dropped off new ones. Custom Print continued testing new, promising products while getting rid of half-used bottles and cans.

These changes reduced the number of chemicals on-site from over 80 to just 24 — a 70% decrease. This has cut pollution and waste (by reducing the amount of expired chemicals), potential liability, inventory, and related costs resulting in an estimated \$5,000 savings per year.



## Don't Overlook the Pollution Prevention Opportunities in your Fixed Costs

Five years ago, Custom Print had problems with unpleasant odor and employee-reported headaches associated with isopropyl alcohol in their fountain solution. To reduce the odor, the company installed an air conditioning system with a high-volume fan. A year later, Custom Print switched to an alcohol-free fountain solution. While this change removed the source of the odor, the air conditioner kept on running at the high volume that had been needed when the alcohol-based solution was in use.

That air conditioner continued working at maximum capacity until an employee accidentally turned off the fan. This flip of a switch completely changed the ventilation in the shop. It reduced the air exchange rate and led to a fortunate - and profitable - discovery: now that the alcohol-based fountain solution was gone, less air exchange was needed. Cutting the air exchange rate had several benefits:

- The air conditioner was able to keep the shop cool more easily, saving energy and reducing the electric bill by 40%.
- Since the air conditioner was no longer running at maximum capacity, Custom Print was able to renegotiate their service contract at a lower price.
- The slower system held the temperature and humidity in the press room more constant, leading to more consistent print quality.
- During the winter months, the press room could be heated with just the heat generated by the operating presses, conserving energy and reducing heating fuel bills. The heating system was only used on Monday mornings to warm up the shop as the presses were starting up.

Overall savings associated with using a more appropriate air exchange rate included:

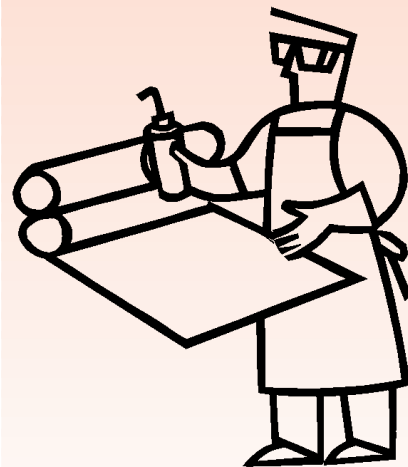
- An electric bill reduction of \$2,000 per month (from \$5,000 to \$3,000)
- A renegotiated service contract, for savings of \$200 per month
- A reduced heating bill, for savings of \$400 per year
- A total savings estimated at \$26,800 per year

Conserving energy and natural resources is a pollution prevention method that is often overlooked. The lesson learned here is that there may be opportunities for pollution prevention in some of your fixed cost operations, such as ventilation, heating, and air conditioning. Remember, when making changes, it is essential to have enough ventilation to keep the press room safe.

## Keep Looking for New Opportunities

According to many printers, one of the greatest obstacles to preventing pollution is resistance to change. People are especially slow to change a familiar process. Also, the daily demands of production often make it hard to step back and evaluate the production process itself, no matter what benefits might result.

By taking an objective view of its operations — and by asking for input from both company employees and vendors - Custom Print made its facility environmentally safer and saved money too. By conducting regular evaluations and working as a team, you too can realize the benefits of change.



## What You Can Do

### Always:

- ☐ Be aware of possible pollution prevention opportunities
- ☐ Use teamwork in preventing pollution
- ☐ Look for opportunities in all parts of your process, including your fixed costs such as electricity

### Conduct a process evaluation by:

- ☐ Looking at each step of the printing process
- ☐ Drawing a diagram of the ENTIRE process marking materials and waste
- ☐ Eliminating costs associated with lost raw materials, collecting, tracking, and disposing of that waste

### Practice chemical consolidation by:

- ☐ Using multi-task chemicals
- ☐ Eliminating duplication
- ☐ Giving unused samples back to the vendors

### Reduce waste ink by:

- ☐ Mixing ink from base colors with the help of computer programs
- ☐ Paying only for ink that is used

### Don't forget to:

- ☐ Review pollution prevention methods through workplace practices
- ☐ Look for new opportunities

**Partners in the Design for the Environment Lithography Project: Printing Industries of America, Graphic Arts Technical Foundation, the Environmental Conservation Board of the Graphic Communications Industry, The University of Tennessee, and individual printers and suppliers.**

## Reducing Wasted Ink

Later, Custom Print turned its attention to improving its ink room operation.

Ink was being wasted: colors not often used would expire before they were needed again. And with hundreds of ink cans on the shelves, it was hard to locate the ink needed for the job. The company worked with its ink vendor to change the entire operation of the ink room:

- Custom Print bought a scale and trained employees to mix the ink from base colors, rather than ordering premixed PMS colors.
- The company also purchased an inexpensive MixMaster computer program. This program, licensed by Pantone, gives formulas for mixing inks from colors in the company's existing inventory.
- Through a consignment agreement with its ink vendor, Custom Print began to pay only for the ink it actually used. Even though Custom Print continued to store ink on-site, until a can was opened it remained the property of the vendor.

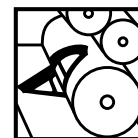
Custom Print's ink room is now a more organized and cost-effective operation. They are saving approximately \$8,000 per year. And they have reduced waste and pollution by dramatically reducing the amount of expired ink.

## About the Design for the Environment Lithography Project

The goal of the Design for the Environment (DfE) Lithography Project is to provide lithographers with information that can help them design an operation which is more environmentally sound, safer for workers, and more cost effective.

Concentrating on the process of blanket washes, the partners of the DfE Lithography Project, in a voluntary cooperative effort, evaluated 37 different blanket wash products. Information was gathered on the performance, cost, and health and environmental risk trade-offs of the different types of substitute blanket wash. For more details on the evaluations, please refer to the "Evaluating Blanket Washes: A Guide For Printers."

In addition to the Lithography Project, similar DfE projects are currently underway with both the screen printing and flexography industries.



To obtain additional copies of this or other bulletins and case studies, or for more information about EPA's Design for the Environment Program contact:

EPA's Pollution Prevention Information Clearinghouse (PPIC)

U.S. EPA

401 M Street, SW (7409)

Washington, DC 20460

Phone: (202) 260-1023

Fax: (202) 260-4659

E-mail: [ppic@epamail.epa.gov](mailto:ppic@epamail.epa.gov)

DfE Web page: <http://www.epa.gov/dfc>