CASE STUDY: Bloomsburg Mills , Inc.

Location:	Monroe (Union County)
Industry:	Textile Dyeing and Finishing (SIC 2269)
Pollution Prevention Application:	Chemical Substitution, Equipment Upgrade, and Recycling
Annual Savings:	$38,881
Contact:	John E. Ward, Chief Chemist, (704) 289-2539

Background

At its Monroe facility, Bloomsburg Mills scours, dyes, and finishes approximately 22 million yards of fabric each year. The basic flow of material through the plant begins with the scouring of incoming greige and yarn-dyed fabrics. The scoured fabric is then jet-dyed at high temperature and pressure. The application of a chemical or mechanical finish is the last process before the fabric is shipped to cut and sewing facilities.

The company has actively pursued and implemented waste reduction and recycling programs throughout all the production processes. These programs were implemented in response to increased landfill fees and regulatory requirements and as part of the membership requirements in the American Textile Manufacturer Institute's, Encouraging Environmental Excellence (3E) Program.

Waste Reduction Activities

- Most of the greige or yarn-dyed goods arrive at the plant in polyethylene plastic bags. The company purchased a baler to bale this material for shipping to a recycler.
- The length of rolled paper tubes used to handle greige goods during the set-making process has been cut to reduce the width of the final product, and then the tubes are used to ship the finished goods to cutting and sewing operations.
- Racks and containers are located at the work stations so that operators can sort plastic bags and paper tubes as the waste is generated; this sorting eliminates the need for a resorting step later in the waste management process.
- Many of the chemicals used in the scouring and dyeing operations arrived in fiber drums that were sent to the landfill. Currently, chemicals used in large quantities are brought to the plant in reusable tote tanks which are returned to the vendor after consumption. Those chemicals used in smaller quantities are supplied in reusable plastic drums.
- Tetrachloroethylene, biphenyl, and trichlorobenzene were constituents of the dye carrier chemicals used to promote level dyeing. Tetrachloroethylene and biphenyl usage exceeded reporting requirements under SARA III, Section 313. In an effort to reduce regulatory burdens, Bloomsburg Mills discussed with supply vendors the elimination of these chemicals, and a dye carrier containing methyl naphthalene and Rule 66 solvents* was substituted. This dye carrier subsequently reduced the release of the hazardous air pollutants. Also, the company substituted a solvent containing isopropanol and heptane as a suitable spot-washing alternative for 1,1,1 trichloroethane, another hazardous air pollutant. No loss of quality was noted with either of the substitutions.
- All cloth seam cuts and small waste rags are baled and shipped for recycling.
- Aluminum cans are collected and donated to a local Boy Scout group.

- Process heat and water is conserved throughout the facility. Water is conserved during the scouring process through the use of a counterflow washing procedure on the scouring range. The cleaner wash water enters the exit wash unit and counterflows back toward the dirtier units. Counterflow washing provides a more efficient cleaner wash and requires less water. During the dyeing process, cooling water is used to cool the jet dyeing machines. After passing through heat exchangers, the heated water is used in initial baths and washing in other stages of the process, thus reducing heating fuel consumption. Instrumentation and process controls for the dyeing process were upgraded from manual to computer control. The controlled time of the wash after dyeing has significantly reduced fuel heat consumption and water usage.

Waste Reduction/ Annual Savings

The dye carrier substitution reduced emissions of the hazardous air pollutant, tetrachloroethylene, by 91 percent from 64,713 lbs in 1988 to 5,932 lbs in 1993.

The computerized automation system on the dyeing process has resulted in a 28-percent reduction in water consumption and a 15.9-percent reduction in fuel consumption per yard produced.

As a result of the reuse and recycling programs, solid waste disposal from the plant fell 85 percent, from 3,744 yd^3 in 1993 to 560 yd^3 in 1994. By receiving and storing process chemicals in reusable totes and plastic drums, the company eliminated the disposal of 50 drums to the landfill each week. The following table presents a breakdown of the quantity of material diverted from the landfill and the cost savings realized from eliminated disposal costs and resale of the collected material.

Bloomsburg Mills: Material Collected and Savings/ Revenues Realized Through Recycling Programs Per Year

Item	Quantity diverted from landfill, tons	Landfill Savings, $	Sales Revenue, $
Paper board	40.6	1,218	954
Rags	36.4 (52 bales)	1,092	0
Plastics	20 (32 bales)	600	800
Aluminum	0.8	24	0
Fiber drums	21.2	636	0
Paper tubes	30	900	33,000
TOTAL	149	4,470	34,754

By diverting 149 tons of waste from the landfill and after subtracting the cost of strapping, the company realized $38,881 in disposal costs savings and recycling revenue. This figure does not include savings from reduced water and fuel oil consumption.

- Rule 66 solvents are designated as non-photochemically reactive and, thus, are exempt from most reporting requirements.