

Midland Brake reduces waste costs

Dan Willis, environmental engineer at Midland, led the company in pollution prevention planning to reduce waste costs. He championed the pollution prevention efforts by attending conferences and workshops and networking with other manufacturers, technical assistance providers, and vendors.

Midland Brake Company of Iola, Kan., is succeeding in preventing pollution in its production processes while boosting profitability.

Since 1990, Midland has taken steps to recycle paper and cutting oil, substitute water-based cleaners for solvent cleaners, and improve finish and coating processes. These measures resulted in more than \$190,000 in total cost savings from 1990 to 1994.

Beyond the bottom line, the pollution prevention effort has been good for Midland's image. In 1995 the Kansas Pollution Prevention Awards Committee recognized Midland as a "Trendsetter" company.

Commitment made it happen

Midland, a manufacturer of brakes and brake components for large trucks and tractor-trailers, with gross sales of more than \$85 million a year, has been instituting source reduction and waste minimization practices with management support since the enactment of the Pollution Prevention Act of 1990.

Company executives attribute Midland's success in protecting the environment to management commitment, employee involvement and a staff member who is an advocate of pollution prevention.

Midland's commitment also extends to financial considerations. For most of its new manufacturing projects, the company requires a two-year payback; however, it often includes potential fines in justifying an environmental project. It has also reduced the payback requirements for environmental or safety projects.

But, while reduction in operation costs has been a positive outcome of P2 endeavors, it has not been the driving force behind capital expenditures. Rather, Midland's P2 program aspires to do the best for its own personnel and the environment.

Cutting oil recovery system

Midland uses water-based cutting fluids for machining zinc and aluminum parts. It pipes the fluid from the storage tank directly to the machines, virtually eliminating spills. Used cutting fluid passes through a coalescer which separates tramp oils. A technician adjusts the cutting fluid's oil-water concentration before the fluid returns to the cutting fluid storage tank.

By using better quality equipment, tightening cutting machine seals to prevent tramp oil leaks, routinely cleaning sumps, and removing chips (where bacteria may grow), Midland has extended the life of its cutting fluids. Cost savings from switching to water-based fluids funded a new job, providing preventive maintenance on the cutting machines.

When disposal is required, oil and particulates are separated from water in the coolant. The water goes to an industrial waste water treatment facility and the oil is sent to a fuel blender. As a result, Midland has reduced its oil waste stream 73 percent, from 37,000 gallons in 1990 to 10,000 gallons in 1995 (projected). The cost savings from these efforts is \$66,000 annually.

The Tide is in, solvents out

To clean machine parts in preparation for accurate measurement in its tapping and turning areas, Midland has switched from petroleum-based solvent to water-based detergent. The company installed heated parts washers so it could use water-based detergents. Midland found that liquid Tide™ or Dawn™ work well for these parts washers. Annual cost savings are \$2,500.

Waste from these parts washers, as well as floor scrubber water and storm water runoff, goes into a wash pit. All water from the pit passes through a \$1,200 coalescer to separate oil and water. A vendor recycles the oil at no charge to Midland. The water goes to the publicly owned treatment works.



SBEAP Case Study: Midland Brake

Finishing processes now shine

To improve chromate coating operations, Midland reduced water usage, cut immersion time and increased drain time.

Midland applies chromate conversion coating to some manufactured parts, primarily to provide corrosion resistance.

Chromate conversion involves an alkaline bath wash, followed by two counter-current rinse baths. Parts are then placed in a nitric acid/ammonium bifluoride etch bath, followed by two counter-current rinses. Next, parts are dipped into the chromic acid tank and rinsed twice. The final rinse is heated.

Improvements on this process since 1990 include reduced water usage (lower rate of water flow in the rinse tanks) and longer drain times (which reduce chemical carry-over).

In the nitric acid etch bath, process improvements decreased nitric acid use by 58 percent (from 209,000 pounds in 1990 to 88,000 pounds in 1994). Staging time was increased to minimize drag-out, and immersion times were cut in half.

Midland has a waste water treatment system for the chromate conversion line. It reduces hexavalent chrome to trivalent chrome and adjusts the pH. Calcium chloride and ferric chloride are added, as is a polymer flocculent, to precipitate the chrome and zinc. The precipitate is pressed to remove excess water, forming wet filtrate cakes, which are shipped to Rockwood, Tenn. There the cakes are vaporized in a kiln; gases are condensed; and zinc and chromium are sent to foundries on the East Coast. These line changes reduced hazardous cake waste by 35 percent (from 56,700 pounds in 1990 to 36,800 pounds in 1994). This represents an annual cost savings of \$34,000.

Take a powder . . . coating

Midland switched from manual to automated powder coating in the fall of 1993.

The new booth cost \$100,000, but payback took less than

two years. The excess powder is mixed with virgin powder in a 1:1 ratio. No air or liquid wastes are associated with this process. Because the powder application is automated, operators no longer need respiratory protection — a substantial added benefit.

Every time powder is collected and mixed with virgin powder for reapplication, the particle size of the residual powder is smaller. Eventually, powder particles become so small they no longer adhere to parts. At this stage, Midland cures the powder and sends it to the landfill as nonhazardous waste and begins the process again with virgin material.

Small change produces big difference

By making one small change, Midland also eliminated one hazardous chemical from its facility completely.

In 1992 Midland switched from its xylene-based ink striping for stroke indicators on push rods to a tape applicator. Doing so eliminated xylene emissions from its facility. This also removed the hazardous material requirements and air permitting requirements associated with using xylene.

Recycling paper cuts solid waste 80 percent

Midland bales cardboard and recycles office white and computer paper. This has reduced plant solid waste volume by 80 percent since 1990. The first baler cost \$6,000 — but paid for itself in less than two years from cardboard sold to a local recycler. The employees then built a second baler. Cost savings from recycling cardboard totaled \$17,000 in 1994.

More information

For further information on Midland's efforts, contact Dan Willis, 316-365-6911, extension 259. For other case studies or to discuss pollution prevention opportunities for your facility, contact SBEAP at 800-578-8898.



The Small Business Environmental Assistance Program's (SBEAP) mission is to help Kansas small businesses comply with clean air regulations. SBEAP operates through a consortium of the University of Kansas, Kansas State University and Wichita State University. This manual was published by Kansas State University's Pollution Prevention Institute. For more information, call 800-578-8898 or send e-mail to SBEAP@ksu.edu. The University of Kansas, Kansas State University and Wichita State University are EEO/AA providers.

