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**waste
Reduction
Program
of Oregon**



The Eastside Plating Success Story

Pollution prevention and hazardous waste minimization are a top priority at Eastside Plating Works, Portland's oldest and largest electroplating company. "It's made Eastside a better shop," says Jim Thibodeau, Vice President. "We're cleaner. Our people are happier. Our productivity is up. And we produce a better product."

Eastside does its homework

Eastside Plating has made money complying with new environmental regulations. Under the direction of Tom Loos, Maintenance and Water Treatment Manager, the electroplating firm implemented operational changes that save more than \$300,000 annually.

But Loos recommends a cautious approach when it comes to upgrading plant operations. He warns against hurried contracts with anyone promising 'bulletproof' systems at 'bulletproof' prices. Turning down one such offer with a price tag of \$250,000, Loos instead brought Eastside into compliance for \$75,000 by upgrading existing equipment and purchasing used, as well as new, equipment.

He credits classes offered by the American Electroplating Society, Conventional Waste Treatment Technology for Heavy Metals, and Department of Environmental Quality for helping him find affordable yet effective solutions.

Eastside's 'first generation' upgrade improves efficiency

Eastside Plating management made the commitment to implement a hazardous waste reduction program in 1982. By changing rinsing techniques, substituting materials and segregating wastes for treatment, the firm has become a more cost-effective operation.

The changes were possible using available technology, according to Loos.

Compliance one step at a time

Eastside Plating began modifying its operation to comply with environmental regulations. By setting priorities and upgrading in phases, the firm was able to work toward compliance yet meet increased demand for services during a period of rapid growth.

The first operational modifications addressed counterflow and cascade rinsing systems. The changes decreased water used for rinsing, a process that accounts for 90 per cent of all water used in electroplating.

In counterflow rinsing, water is used a number of times, dramatically reducing volume required. Fresh water is introduced in the last tank of a multiple tank system, and flows toward the source of contamination.

Cascade rinsing requires only one tank with a center divider which allows water to spill into the other side. The filling/draining process is continuous and very slow to reduce the amount of water used.

Both systems cut water bills and wastewater treatment costs and greatly reduce the risk of violating anti-pollution laws.

Substitute materials decrease wastes by 50 per cent

Loos next searched for waste treatment chemicals that decreased, rather than increased, the production of sludge. Total chromium and cyanide wastes were cut in half simply by changing reducing agents.

Chromic acid wastes now are oxidized by using sodium bisulfite and sulfuric acid instead of ferrous sulfate, while cyanide reduction now is accomplished more efficiently with gaseous, instead of liquid, chlorine.

Automation cuts chemical use

Eastside Plating then upgraded its three major waste treatment components: the cyanide oxidation tank, the chromium reduction tank, and the acid/alkalai neutralizing tank. The goal was to separate tank flow, eliminate contamination of the acid/alkalai neutralizing tank and increase efficiency.

Automated metering equipment reduced the quantity of costly caustic chemicals needed to treat acid wastes by 50 per cent. To eliminate the risks associated with pump failure and to equalize flow rate, cyanide and chromic acid oxidation and reduction tanks were redesigned as gravity flow systems. Finally, plumbing was segregated to prevent cross-contamination.

These simple solutions have saved Eastside Plating hundreds of thousands of dollars. They've also reduced its 'cradle to grave' liability for hazardous wastes.

Suppliers are cost-effective problem solvers

Loos consulted with suppliers when he modified Eastside Plating's mixing sump (sometimes called a reaction tank) and a flocculent mix tank (sometimes called a neutralization tank). Treated chromic and cyanide water rinses flow into the sump, where the pH is increased by mixing it with strong caustics before it is pumped to the flocculent mix tank.

"We prefer to have any pH or flow fluctuations in the sump, not the neutralization tank," says Loos. Inadequate mixing and fluctuations in pressure and flow had caused engineering nightmares in the past, he adds.

But Loos no longer has nightmares about 'indigestion' in the mixing sump interfering with the neutralization process. Redesign resulted in three pumps handling ongoing operations--- as well as emergencies. His suppliers/consultants helped resolve the problem of inadequate mixing by baffling the neutralization tank. To find the best coagulant, he worked with five companies, doing extensive jar testing and comparison studies, before selecting a dry anionic polymer.

"Engineering assistance is readily available," Loos says. "Companies want to make a sale and we gave them the opportunity to demonstrate their products."

Regulators can help, too

"The non-compliance gap can close like a bear trap," warns Loos. To ease the pain, he recommends working with regulators instead of trying to avoid them. "The City of Portland and the Department of Environmental Quality were more interested in helping us solve our problems than in blaming us."

He credits the city's industrial sewage specialists and DEQ waste minimization classes for helping him find an effective yet affordable clarifying and drying system.

This upgrade uses a new clarifier, a new dryer, and a used sludge press to separate liquid and solid wastes. The system met Loos' specified requirements: it is easy to maintain; it shortens the final de-watering process; and it decreases the flow rate to an average of 125 gallons/minute, with fluctuations of not less than 70, nor more than 180, gal/min. The clarifier's slanting 60 degree lamella plate design allows the sludge to slide to the bottom where it's raked at the rate of one revolution every ten minutes.

The new clarifier is a lot nicer to work with, says Loos. Eastside's old floating sludge blanket design clarifier often "upchucked out the top and upset everyone."

His bosses love to hear Loos tell the story of how he saved \$19,000 by purchasing a used press rather than a new one. This final modification resulted in a 4-1 reduction in sludge volume and annual net savings of \$16,000.

Employee education and participatory management makes Eastside Plating Works---WORK

Employees can make or break the best anti-pollution plan. Eastside Plating has an extensive employee education program. "It's a matter of changing how we do business," says Loos. Storage and movement of chemicals and sludge is planned to be "stupid-proof." Eastside's Safety Committee helps all employees work together more safely.

Eastside Plating's philosophy is that the buck stops with each employee. In keeping with that philosophy, each employee has Line Manager responsibility.

'Second generation' improvements planned for future

With the consolidation of its three operations into a new building by 1990, Eastside Plating plans even more modifications to further reduce the possibility of errors and accidents.

According to Loos, successful electroplating companies of the future will recycle the precious metals used in plating operations. Gold, silver, cadmium and copper will be salvaged through the use of plate-out recovery units and distillation and smelting operations for repeated use.

Electroplaters need only look at California to see that additional restrictions are likely partners in future operations. Nickel hydroxide sludge soon may be declared a carcinogen danger. While sludge and wastewater are now the only regulated wastes in the industry, clean air standards for chromic and nitric acid emissions may require costly scrubbers. Proper handling of filter paper and cartridges used in sludge treatment will be important in limiting long-term liability.

Loos says he's happy that Eastside hasn't been a player in the 'cradle to grave' liability associated with dumping sludge in landfills. "Dilution is no longer the solution to pollution. Metal finishing and plating companies must become responsible, environmentally-aware professionals if our companies are going to survive."

What works for Eastside Plating can work for you

Your company need not be a corporate giant to benefit from the waste minimization technology used at Eastside Plating. All it takes is a commitment to excellence and the willingness to ask for help. DEQ would like to be part of your company's solution to the hazardous waste problem.

Profile is produced and distributed by the Hazardous Waste Reduction Program of the Oregon Department of Environmental Quality (DEQ). For more information, contact DEQ, 811 SW 6th, Portland OR 97204; or call (503) 229-5913. Outside the Portland area within Oregon call 1-800-452-4011.