Case Study: Ilco Unican Corporation

Location:	Rocky Mount, NC (Nash County)
Industry:	Metals Manufacturing/Plating (SIC 3471)
Pollution Prevention Application:	Process Modification
Annual Savings:	$36,223
Payback Period:	7.3 months
PPP Challenge Grant Awarded:	$5,000
Contact:	Brian Wells, Project Engineer, (919) 725-1331

Background

In 1989, the Ilco Unican facility in Rocky Mount plated 800,000 key blanks per day with nickel. During plating operations, rinse tanks are used to remove solution left on the product from the plating bath. The "drag out" from the plating bath inevitably builds up in the rinse tank to a point where the tank is no longer pure enough to rinse the parts. Traditionally, the rinse water would be removed and treated to form a hazardous sludge. This treatment process is very costly, and it wastes nickel that could otherwise be used.

Waste Reduction Activities

To eliminate this problem, Ilco Unican began using an inexpensive and low-maintenance atmospheric evaporation system by which dry air is passed over the plating solution, which increases the rate of evaporation of the water in the bath. Sufficient water is evaporated so that the rinse water can be recycled into the plating bath. This system not only reduces the need for rinse water treatment but also utilizes nickel that would otherwise be lost. Evaporation rates can vary with air flow, bath temperature, air temperature, and humidity.

To ensure optimum efficiency, the evaporator should be located next to a clean, dry air source and the plating bath tank. If the air is not clean, contaminants can enter the plating bath and cause unacceptable finishes or increase the necessary plating time. Ilco already uses a carbon filtration system in the plating bath to remove contaminants that enter the bath from the materials being plated. With this system, Ilco has found that no plating or rinse baths need to be dumped and treated.

Waste Reduction

The closed loop system eliminates the need to add any nickel sulfate or nickel chloride whereas Ilco Unican had been using 6,400 pounds of nickel chloride and 22,000 pounds of nickel sulfate a year. The in-line recycling loop also allows for an 80-percent (7,040 pounds) recovery of boric acid. Only the disposal or treatment of the plating bath sludge created by the filtration system is necessary.

Annual Savings

With installation, the two evaporator systems cost about $12,200. Maintenance and energy costs run approximately $24,741 per year. Reductions in nickel chloride, nickel sulfate, and boric acid saved the company $9,280, $19,360, and $3,328, respectively. The project also saw immense savings from the elimination of the rinse tank sludge. Disposal and handling of the waste were costing Ilco Unican $25,131 a year. The payback period for the project was 7.3 months with subsequent annual savings of $36,223 a year.