



Plating Line Opens Waste Treatment Opportunities

(Reprinted from PRODUCTS FINISHING magazine)

At Standard Aero Ltd., the decision to install a chromium plating facility and on-site wastewater treatment system offered an opportunity to assess waste handling in other areas of the plant. The Canadian aircraft engine and component overhaul/repair facility located in Winnipeg, Manitoba, is now getting double duty from its wastewater treatment system.

The system, intended only for plating rinse waters, also treats concentrated wastes from departments that had previously had them hauled away as hazardous wastes.

Standard Aero's story is bound to be repeated many times over as plating industry executives factor in the growing role of environmental compliance, water use, resource reuse, and water minimization in plant economics. The emphasis is on treatment technologies that can be applied to variable waste streams, plant designs that allow one wastestream to play off another during the treatment process, and other methods of making compliance pay.

Designed and built by Beckart Environmental, Inc., Kenosha, Wisconsin, the wastewater treatment system went online simultaneously with Standard Aero's new plating department. The department primarily handles chromium -- but also silver and copper -- plating on various aircraft components, as well as cadmium stripping. Typically, rinsewater and scrubber water containing chromium, cyanide, and various acid streams are collected in two pits located below the plating line. The maintenance schedule is two to three scrubber wash-downs per day using fifty gallons per wash, so the water is highly concentrated.

Chromium and cyanide destruction are accomplished in separate two-step processes involving adjustment in pH and chemical reactions with sodium metabisulfite and sodium hypochlorite respectively. These reactions convert cyanide to cyanate, and chemically reduce chromium from its hexavalent to trivalent state. Secondary reactions are the oxidation of cyanate to carbon dioxide and nitrogen, and



the neutralization and precipitation of the trivalent chromium. A programmable logic controller (PLC) makes all chemical and engineering decisions within the treatment system, regulating critical reaction times, monitoring and adjusting pH, and the metering of treatment chemicals. The PLC also controls transfers from equalization tanks to treatment tanks, sedimentation clarifier, and filter press. In addition to the equalization tank dedicated to the plating line, a second equalization tank is used for spent concentrates brought by drum from various parts of the plant. Cooling water from plant compressors and rinse waters from an anodizing line are used to dilute the concentrates. Spent acids from the plant are also added to help neutralize the highly alkaline solutions. The treatment scheme incorporates some waste streams in the treatment of others while minimizing overall water consumption.

According to the company, the new wastewater treatment system was selected primarily because of the technologies involved, the comprehensive design, and the ability of the manufacturer to assist when wastewater treatment requirements change. The firm notes that the system's 20 gpm sedimentation clarifier, originally designed for operation 20% of the time, is currently operating about 60% of the time. Standard Aero has increased the system's filter press capacity as its needs have grown, and the company is now generating about three tons of sludge monthly. The company is considering sludge drying equipment that would further reduce disposal costs.