

Case Study



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY • ENVIRONMENTAL ASSISTANCE DIVISION • 1-800-662-9278

Hajjar Plating Services

Wayne, Michigan

SOURCE REDUCTION THROUGH ON-LINE RECLAIM AND ION EXCHANGE

Hajjar Plating Services, a job shop located in Wayne, Michigan, was faced with the challenge of minimizing waste from its electroplating operations and explored options and respective costs. Its choice? A combination of resource conservation and metal recovery.

Hajjar Plating Services produces decorative nickel and chromium plating for automotive parts (bumpers, trim, etc.), both for repair and after market use. Prior to implementing source reduction and metal recovery technologies, the facility treated electroplating waste on site using conventional wastewater treatment and disposal methods.

To minimize electroplating waste, Hajjar Plating Services decided to take a pollution prevention approach to managing its plating operation. The improvements were made in two phases.

In phase one, the facility installed a new rinse system on its nickel and chromium plating lines. This process modification consisted of installing two nonflowing rinse tanks in series before the

final rinse tank. These tanks are replenished as follows: water in the first rinse tank is used to make up the liquid level in the final plating (nickel or chromium) tank. The level in the first rinse tank is maintained with water from the second rinse tank, and the second tank is replenished with water from the plant's deionized water system.

Hajjar equipped the nickel rinse tanks with a 75 micron napped polypropylene to filter out insoluble inorganic contaminants. Carbon packed paper filter cartridges are used to remove organic impurities. Because of the strong oxidizing properties of chromic acid, a major component in a chromium plating bath, the

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company elected not to equip the chromium rinse tanks with filtration and purification equipment.

In phase two, Hajjar installed ion exchange columns on the final nickel and chromium rinse tanks, and modified the respective rinse system.

Hajjar also converted the rinses from stagnant to counterflow rinses. With the exception of the final nickel and chromium rinse tanks, the level in the tanks is maintained as described above. In the final rinse tanks, the levels are kept constant with water from the ion exchange columns and the plant's deionized water system. This arrangement resulted in a 58 percent reduction in annual water usage.

For Hajjar Plating Services, the decision to install two counterflow rinse systems with ion exchange proved to be the right choice. However, the decision did not come easy. The cost of purchasing and operating an ion exchange system was a major concern. After careful deliberations, the company decided to lease an ion exchange system from Interlake Environmental Systems.

The partnership worked from the very beginning. Hajjar saved money by not having to invest large

sums of capital in expensive equipment, and Interlake benefited from leasing the equipment and reclaiming the captured metals. As part of the agreement, the ion exchange columns are regenerated off site by the lessor to recover metals for resale. For Hajjar, this practice has reduced the amount of electroplating waste treated on site and has lowered water, sewerage, treatment and disposal costs. The combined savings have offset costs associated with leasing the equipment. Both Hajjar and Interlake can attest that this is a mutually beneficial partnership.

"If a business is told that it must meet a lower level of pollution and is not instructed how to do it (a performance standard), it may examine a range of options including source reduction, recycling, treatment and disposal. The business may choose a technique or combination of techniques that provides it the highest possible profits, given that it is required to reduce pollution to a specific level. All else being equal, the business will choose a combination of techniques that minimizes the cost of pollution control (including any costs associated with lost production) across its various options."

*—Gloria E. Hendon,
The Simple Economics of
Pollution Prevention*