SERFILCO® CASE HISTORY

NICKEL PLATING
"The Rest of the Advance Plating Story"

When this story was first published (see below), Advance Plating equipped the 2 Guardian filtration systems on their 5,000 gallon nickel tank with 20 and 30 micron filter cartridges to achieve the level of clarity they felt was necessary to produce quality finished work. As a job shop, they required high quality, regardless of whether they were plating wire goods, stampings or tubular items. And, they were successful. Their plating bath remained clean and they never experienced any roughness in the deposit.

But they did notice that once their plating solution reached the clarity they desired, it was still necessary to change the cartridges on a relatively regular basis. Again, they relied upon SERFILCO experience to help them out. SERFILCO has long promoted the idea that good filtration is dependent not so much on the micron rating of the filter as it is on turnover rate, which can be defined as the number of times the solution passes through the filter in a given period of time.

Since their Guardian systems had been sized to provide an ample number of turns of the solution to keep the bath clean, it became a matter of adjusting the micron level of the cartridges to extend the interval between cartridge changes without adversely affecting the desired bath clarity. SERFILCO literature led them to understand that the denser the cartridge, the less solids holding capacity it has and the quicker it will become loaded with solids and require changing.

So they changed from the 20 and 30 micron cartridges they had started with to 50 micron cartridges and watched their bath and their output closely to be sure the change didn't lower the quality of the work. Here's what they found:

1. Bath clarity remained constant and work quality remained high. Even after the change to 50 micron cartridges, they never experienced roughness.
2. Cartridges last 50% longer before they must be changed.
3. The longer interval between cartridge changes resulted in a two-fold cost savings — cartridge consumption dropped and fewer cartridge changes meant a labor savings as well.

And, because their system allows them to backwash the cartridges with hydrochloric acid right in the filter housings, they have the option to wash and re-use the cartridges a couple of times before they must be discarded — which they can do as neutralized waste.

Obviously Advance Plating did their homework when they selected the Guardian systems and they continue to study and improve their operation. If you want more information on how filter sizing and micron selection can improve your operation, ask us for Technical Bulletin TF-118, "How to Pick Plating Filtration Systems".

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HOMEWORK PAYS OFF

Flexibility and future growth are major considerations in expansion at Advance Plating.

Advance Plating Corporation in Worcester, Massachusetts, is a family-owned company that operates with the accumulated expertise from three generations in plating. The company has always prided itself on quality workmanship and service to its customer base. Being offered are automated and manual rack, bright nickel and chrome plating. In addition, prefinishing by vibratory or rotary tumbling is offered.

In 1994, the owner, Steve Jorjorian, decided that he had to install an automatic plating line to offer his customers better quality with a quicker turnaround time at competitive prices. It would be a major expansion for Advance Plating, and a great deal of planning and consideration went into the design of the line as well as its auxiliary equipment.

One of the key ingredients was the filtration system for the 5,000 gallon nickel tank on the line. Various types of filtration equipment were considered, including disc, bag, precoat and cartridge filtration. Company officials traveled to Ohio to evaluate systems being used by Cleveland area plating shops on comparably sized lines. In the end, the decision was made to go to high flow rate cartridge filtration with bypass carbon purification to maintain the bath for optimum quality.

Today's platers are striving for the highest level of quality (no rejects) and must consider various means of filtration. A plater has to balance the cost of the initial investment in equipment with the savings to be derived from the reduction of roughness and possible rework.

Advance Plating already had been aware of the successful experience using high flow rate and depth cartridges on plating lines at its sister company, Hi-Tech Gold Plating Corporation. It was only natural to consider the advantages of employing high turnover levels with media which offered increased solids holding capacity, but they were also concerned with possible future disposal problems.

Another major concern of choosing the right filter system was to have the ability to handle a *state-of-the-art* proprietary designed air agitation system in their nickel bath that would give them the edge on quality.

Some filter companies offered equipment which included a backwash capability, but considerable additional water would be required. Others were susceptible to bypass of filter aid or powdered carbon. Space requirements for some equipment also proved to be a problem. Advance Plating had a limited

area that could be devoted to the filtration equipment, so a system with a small footprint was a "must".

Jorjorian felt that he required a filter media which could be reused, hold considerable solids, yet not plug up prematurely. He concluded that a combination depth-type cartridge with a means of dissolving the heavy metals from plugged cartridges, of which most were ferrous, might offer the best results. Although a conventional style slurry tank could be employed, he felt that a number of quick-connect couplers would provide him with the type of system he needed. They would allow him to easily and quickly change the source from water for rinsing to spent acid for dissolving the iron.

Jorjorian then contacted the Engineering Department at SERFILCO and, with their assistance, developed what he later called "a plater's dream" in continuous filtration. It was a specially designed filtration system that included two Guardian filtration units and a number of quickconnect couplers and valves in conjunction with an auxiliary slurry tank system that eliminated the need to open a filter chamber every cycle to service in the traditional manner.

Advance then purchased the equipment and it was delivered ready to be installed and used. The justification for two systems was to give a high turnover rate as well as the ability to service one filter while the other is still performing at a high flow rate. Right from the start, the filtration system was designed to minimize solution loss and to extend cartridge life by recycling the cartridges in the filter chambers themselves.

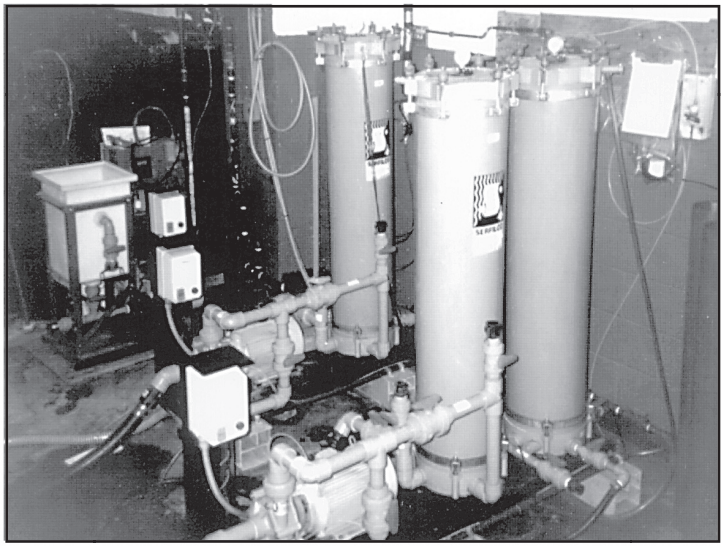
Piping systems were installed in such a manner that when the cartridges in one filtration system became plugged, the filter system could be isolated from the plating tank and the solution pumped from the filter chamber into the plating tank to eliminate solution loss. Then, by proper valving and quick-connect couplers to the slurry tank system and its pump, acid washing of the cartridges takes place in the reverse flow in the filter housing.

This procedure allows Advance Plating to get three or more uses out of each set of cartridges without solution loss before the need to open a filter chamber for service. The chambers in this unique system are only opened after the filter cartridges have been recycled several times and can no longer be re-used. Even then, the system provides an ease in precleaning the cartridges for disposal.

While the initial cost might have been slightly higher to provide recycling of the media without the need to remove the filter cartridges from the chamber, the increased flexibility and capacity for future growth resulted in savings in the long run. Of particular concern to the company in making its selection was the issue of maintenance and the amount of downtime it would require. With this process, Advance Plating is able to perform on-line maintenance — totally eliminating the need for Saturday or off-hour work at overtime labor rates.

The system has been up and operating for approximately nine months, with no problems encountered to this time. A couple of synergistic improvements were later added to the initial piping system for the convenience of the operator. As a result of these innovations, cartridges last over two months, disposal costs are reduced and the solution is maintained at optimal clarity for high quality / low reject production.

Jorjorian's assessment of the new equipment — "our homework really paid off. We got the best system available for the job."



Advance Plating can now temporarily shut down one system without losing filtration on their 5,000 gallon nickel bath when cartridge maintenance is required. Each system provides 210 square feet of filter surface area. The system in the foreground also includes a carbon chamber which is valved to provide full or partial flow for removal of organic contaminants, as required. Separate slurry tank system shown in the background is piped to allow backwashing and acid cleaning of filter cartridges in the filter chambers, thereby helping to extend cartridge life up to approximately 8 weeks.

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SERFILCO®, LTD.
2900 MacArthur Blvd.
Northbrook, IL 60062-2005 U.S.A.
e-mail: sales@serfilco.com
847-509-2900
800-323-5431
FAX: 847-559-1995
www.serfilco.com