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SWAIM METALS

POLLUTION CONTROL

In the summer of 1970, our firm built a plating shop in High Point to chrome plate metal furniture. At that time, there were no pollution control laws being administered by the city. There was also little thought on our part as to how we were going to treat for pollution.

During the next several years, there was more talk about future regulations, and we began to think about how we could comply. So we began to invite the industry's experts in to talk to us and give us their ideas and knowledge on the subject. It wasn't long before we realized that the state of the art was very young, and there were a number of different ways to approach the problem. And nearly all of them were expensive.

The more we talked with people and thought about it, the more we realized that all the good systems required production line modifications in order to work properly. These modifications consisted mostly of rinse cycle changes to reduce the amount of water used so it would be easier and cheaper to treat these wastes.

I'm sure everyone here also remembers that the 1970's were the years of prime inflation. It became more and more difficult to make a profit because of the difficulty of raising prices as fast as our own costs were rising. This left only one way to stay in business. We had to become more production efficient and reduce our costs per unit produced.

We decided to make a big change in 1975. Our business was good and we needed more room so we built a new plant. In this new plant we decided to incorporate several concepts that we had been studying. First, we decided to build a hoist line rather than a manual line. This did several things for us. The first thing it did was to reduce labor costs per unit. Put another way, it gave us more dollar of production per man hour worked.

Next, it allowed us to put in an in-line tank for reclaiming some of our chemicals. It also allowed us to put in a counter-flow rinse system that greatly reduced our water consumption. The reduced water consumption did two things. It saved us a lot of money on water bills, and it allowed us to use almost any waste treatment system on the market.

Our two most expensive tanks are the nickel plating and chrome plating tanks. The reclaim tank that we installed was for the nickel tanks, largely because we had several of them, and because they operate at about 140°F. This gave us plenty of evaporation to return the reclaim to the plating tanks rather than let those expensive and polluting chemicals to go down the drain. We had to experiment alot with racking and draining techniques, but we soon found that we could save over 90% of our nickel chemical losses.

About this time the city of High Point began talking with all the platers about the future regulations that they would enforce. This gave us a good idea as to what we would have to do to comply. We ran some analysis tests and found that our nickel numbers were close to being acceptable but our chrome numbers were considerably over the limit. At that point, we had studied about every major

pollution control system, and had about decided to install evaporative recovery units. These are the type that draw a vacuum and heat the water in order to concentrate the chemicals and return them to the plating tank.

Along about this same time, the new trivalent chrome bath was introduced to the market. We studied it for quite some time and liked it for several reasons. First, it got rid of the highly toxic hexavalent chrome; second, it reduced the amount of chrome in the bath to about 15% of what we had; and, it also gave us better production performance.

About four years ago, we decided to change from hexavalent to the trivalent system. Oddly enough, the thing that made up our minds was a problem we had with chrome fumes. Even though we used the best fume suppressants on the market, we still got a small amount of fumes off the tank. Several of our operators got nose bleeds from working near the tank. We changed in March of 1979. Since then we have had absolutely no problems with chrome fumes. The change to trivalent also helped us greatly with our production efficiency.

To summarize what differences there were before and after these changes were made, let me put it this way.

1. We used to use abut 4,000 gallons of water per hour. Now we use less than 400.

2. We now use about 5% of the nickel sulfate and nickel chloride that we used to use.

3. Our production efficiency has increased greatly, allowing us to make a profit and stay in business.

4. The toxic chemicals going into our waste stream have been reduced by over 90%. Because of this, we have not had to ~~produce~~ purchase extremely expensive waste treatment equipment that would have cost almost as much as our production equipment. We used to have between twenty and thirty parts per million of both nickel and chrome, and today we average two or three. And we have eliminated hexavalent altogether, making the folks at the treatment plant alot more relaxed. It seems that even a fairly small amount of hexavalent chrome kills alot of their bacteria that they need to treat the waste.

Although we have not built a closed loop system, we are about 90% there. We know that there are several more steps that we could make to reduce these numbers further, and we will do them when we have to.

We know that quite a few platers have gone out of business because the expensive waste treatment systems put them out. We all realize that we have to clean up our environment, but as the man said, there is more than one way to skin the cat.