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LOWER REJECT RATES for LINCOLN PLATING

***Keys are*: Better parts cleaning - improved filtration . . .**

A two-pronged approach has been taken by officials of Lincoln Plating, Lincoln, Nebraska, to reduce reject rates and lower labor costs at the same time.

Lincoln is one of the largest job shops in the Midwest. It plates a variety of parts, ranging from tubular shapes for furniture to auto bumpers and engine valves.

Lincoln substantially modified its metal cleaning procedures to eliminate a stubborn problem related to fingerprinting and oily soils. At the same time new filters were installed to increase solution turnover rates and lessen plate roughness. Both steps have improved quality, lowered reject rates and saved labor.

This improved cleaning has cut reject rates associated with cleaning from two percent to less than one-tenth percent; better filtration has halved reject rates caused by roughness - from one percent to one-half percent.

Lincoln's most troublesome recent problem involved nickel-chromium plating of square tubing. "*We had a problem with fingerprint smearing,*" said Mike Griebel, Lincoln's quality assurance manager. "*This occurred during racking and was compounded by the oil the furniture manufacturer applies as a rust preventive.*"

New Approach

Lincoln personnel learned that part of the problem was related to the use of highly alkaline cleaners in removing oils. The problem was that in some cases these highly alkaline solutions actually "set up" the oils and grease rather than removing them.

Replacement of the highly caustic soak cleaner with a non-silicated, non-caustic cleaner assured that "set up" no longer occurred. An electrocleaner also was replaced by a heavy-duty alkaline cleaner and desmutter.

Lincoln was then advised to add an acid rinse containing fluoride additive commonly used on zinc die-castings.

Sum total of the changes has been the elimination of the smears as well as the oil and grease problems. A reduction of semi-bright nickel plating time (from 20 to 10 min.) and bright nickel plating time also has been reduced from 30 to 20 minutes.

"Eliminating the hand sponging cuts labor cost, but it has some unseen benefits as well, " said Mr. Griebel. *"Sponging parts over a caustic tank is a job no one wants. So morale in the plating department has been improved by the changes."*

Cleaning cycle time has been cut to 15 min., half what it used to be, and three hours per shift of hand sponging is no longer necessary. Cleaning is now handled by two men rather than three. The third man does racking, plating and inspecting.

FILTER CARTRIDGES are changed only when pressure (being checked by Mike Griebel) exceeds 40 psi. Normally this occurs only twice a year.

Reducing Roughness

Anyone who has plated tubular products knows the problem: try as you may, you won't entirely remove residues left from forming, grinding and cutting. Cleaning steps are meant to do that, but inevitably some of the contamination is dragged into the plating tanks, resulting in shelf roughness.

Lincoln has pursued this problem, installing two new SERFILCO Guardian filters rated at 5000 gph each to filter nickel solutions. At the high flow rates now possible these units are capable of keeping solutions almost completely free of particulate matter. Even small particles - down to 10 microns - are trapped before they can cause roughness.

The new filters lower labor costs, since media changes are normally required only about twice a year, while paper filters used previously had to be changed weekly. Mr. Griebel said four filters (two used for the tubular products line, one for a sulfamate nickel tank and another on a bumper plating line) had required four hours of labor per week to change media. At a theoretical wage rate of five dollars per hour, and for 208 man hours per year, that would cost $1,040 annually. At the same wage rate, the new filters are serviced for 40 dollars annually - a saving of $1,000.

Lincoln now has two 6000 gph Guardian filters and two others rated at 4800 gph. The larger units have twelve 30-inch cartridges and twelve 20-inch cartridges. The smaller units have eighteen 30-inch cartridges each.

These filters provide ample capacity for holding the contamination removed from solutions in the six months between servicing. The string-wound polypropylene "depth-filtering" cartridges resist fouling and thus last longer because they trap larger particles near their surfaces and progressivley smaller particles as the solution is forced toward the core.

Filter Often

A good rule in filtration is to filter well and filter often. High-capacity pumps provide the "often." Two 6000 gph Guardians on 1500-gallon tanks provide solution turnover rates of four times hourly. A 4800-gallon unit on a 1000-gallon tank offers 4.8 times/hr.; the other 4800 gph unit on a 750-gallon tank turns over solution at 6.4 times/hr. Before these filters were installed, the highest flow rate on any tank was two times/hr.

Rejects Costly

Rejects are never easy to correct. At Lincoln, for example, reject bumpers must go to another line for stripping and chemical reactivation. If nickel must be removed, the bar has to go to the polishing department, where nickel is polished off. *"It normally takes 30 to 40 min. to polish it,"* said Mr. Griebel. *"The lower reject rates have cut our rework costs."*

Rigid Specifications for Sulfamate Nickel

In its sulfamate nickel plating tanks, Lincoln plates automotive engine intake and exhaust valves. *"The customer is particular and specifications are rigid,"* Mr. Griebel explained. *"We need to have everything go well to produce the quality required."*

Lincoln uses a sulfamate nickel solution to deposit low-stress nickel and help assure a smoothness by filtering the solution 4.8 times/hr. This 4800 gph filter also has a carbon chamber to remove organics.

"This combination of careful plating and good solution maintenance has paid off," said Mr. Griebel. *"Our reject rates are very low and the customer is satisfied."*

FINAL INSPECTION is done by an operator wearing gloves to help detect roughness. Better cleaning and improved filtration have reduced roughness and lowered reject rates.

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