FILTRATION OF ALKALINE ZINC BATHS

COPPER, BRASS, BRONZE AND CADMIUM, TIN AND SILVER,etc.

Filtration of other alkaline plating solutions are similar to zinc but they are contaminated to a lesser degree and usually easier to filter, with exception of tin which will require coarse media like zinc.

Many electroplaters have doubled and tripled their zinc plating capacity because of the toxicity and high cost of cadmium. The newer zinc plating solutions are capable of depositing zinc faster, brighter and much more uniformly. However, control of solution variables becomes more critical to produce lustrous deposits economically.

HOW TO CONTROL SOLUTION VARIABLES

Continuous filtration is the first step in the fight for good control of solution variables. Despite the difficulty of filtering most alkaline solutions such as cyanide plating baths, it is the only effective method for solids removal. The slimy nature of the sludge makes it necessary to use a coarse filter media in order to reduce pressure loss and prolong cartridge life as much as possible. The new low and non-cyanide zinc baths require much better cleaning of parts and closer bath control. Although metallic contamination is less of a problem, floating oil can build up in the plating tank and must be skimmed off to avoid adhesion failures. Periodic carbon treatment to remove organic impurities will increase deposit brightness and reduce brightener consumption.

PROPER FILTER TUBE, HIGH FLOW RATE ASSURES RESULTS

Serfilco polypropylene or cotton filter tubes, with ratings of 50, 75 and 100 micron, using high flow rates of 2 and preferably 3 times the tank gallonage per hour, with high pressure centrifugal pumps, make it possible to continuously filter any zinc solution. Although particles finer than 50 micron will pass through the filter initially, they will eventually be filtered out as the progressively denser network of fibers retains the coarser particles. Virtually all particles are removed as the cartridge becomes more and more loaded. A high flow rate is required to keep the solids in suspension and carry them to the filter intake. The agitation will tend to keep the solids from settling at the bottom of the tank and on the cooling coils. The high pressure centrifugal pump will also pack more solids into each cartridge.

Three cartridges per 100 gallons of solution provide adequate filter capacity on zinc plating solutions. Pumps which develop higher pressures are desirable because of the heavy sludge loads. Intank pumps could be used, but offer no advantages. Because of the high alkalinity, seals with water lubrication are recommended on centrifugal pumps to prolong seal life. Slurry tanks should be considered for ease of pump priming, chemical addition and precoating, and if necessary, for carbon treatment. See technical bulletin article covering activated carbon purification.

ADVANTAGES OF CONTINUOUS FILTRATION

1. Brighter deposits are obtained with a reduction in brightener cost of 20-25%.
2. Throwing power is increased and faster plating rates are possible.
3. Solution agitation provides easier chemical and temperature control.
4. Cooling coils and heat exchangers can function more efficiently with little or no carbonate scale removal required.

TWO WAYS TO CLEAN OLD SOLUTIONS

Two methods can be used to clean an old zinc solution containing solids. The zinc plating solution is pumped to a separate auxiliary tank for the purpose of settling out the sludge. The plating tank is cleaned of all sludge before the clear solution off the top of the auxiliary tank is filtered back. It is sometimes desirable to add a non-fibrous type filter aid to the solution when it is in the auxiliary tank. Care should be taken in selecting diatomaceous earth, as some will contain silicates, which may dissolve in the plating solutions if left in contact too long. If no auxiliary tank is available, an existing solution may be filtered by recirculation only, but frequent changes of coarse cartridges will be required until clarity is obtained.

With a new zinc solution, or one that has been filtered clean of solids, it is is not uncommon to continuously filter these solutions for 8-12 weeks without filter cleaning or cartridge replacement, if the filter has been properly sized.

FILTRATION OF ACID AND NEUTRAL ZINC BATHS

CONTINUOUS FILTRATION A MUST

There are two types of acid baths, chloride and sulfate. The latter produces a mat deposit primarily used on steel strip and wire. The bright zinc chloride baths are becoming increasingly popular and more recently even non-ammonia, neutral zinc baths have appeared. All of these require continuous filtration. They are susceptible to contamination, particularly with iron, which must be periodically precipitated by hydrogen peroxide treatment. The gelatinous iron hydroxide (pH 5.5) is difficult to filter, since it quickly plugs most dense media.

Continuous filtration of all acid zinc baths is recommended. The system should be sized, 4 cartridges (10") per gallons, in order to minimize filter maintenance. 10 or 15 micron porosity polypropylene cartridges have been found suitable. Special "fibrilated" filter tubes (Purefybe medium porosity) are easier to clean and have longer life in this application. A slurry tank with back wash piping is also desirable for acid cleaning of the filter media. A tank turnover rate of twice per hour is suggested. Non-metallic materials should be used, whenever possible. Water flushed double mechanical seal are required with horizontal pumps using Viton for "O" rings and seals (M2).

HELPFUL TIPS

With good rinsing the iron drag-in can be reduced. All fallen steel parts should be removed from the tank as quickly as possible, since they dissolve in the acid baths. Organic contamination is also common. If oil and grease are allowed to accumulate, they will cause adhesion failures. Any oil on the surface of the solution must, therefore, be skimmed off. Periodic carbon treatment to remove organic contamination may be necessary.

SERFILCO, LTD.

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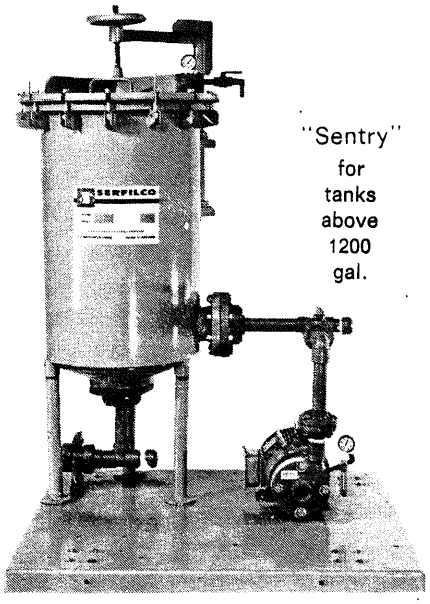
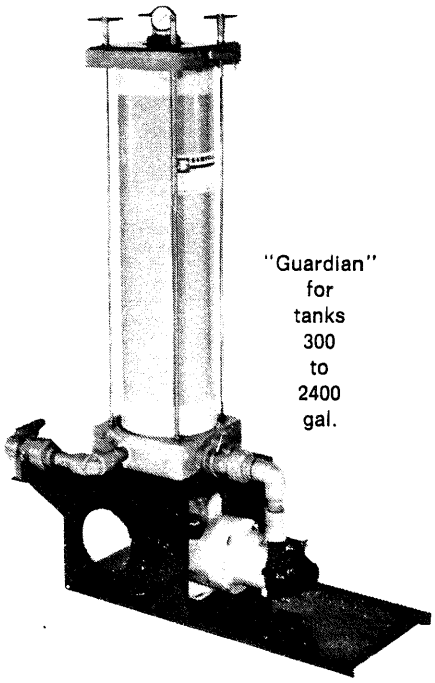
Zinc Solutions CAN Be Filtered

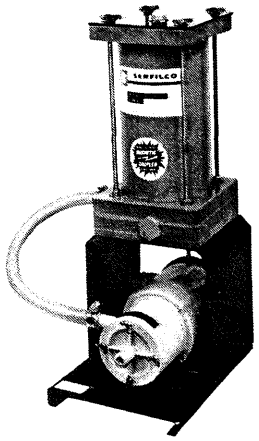
(and should be . . . . especially low cyanide)



"Sentry" for tanks above 1200 gal.



"Guardian" for tanks 300 to 2400 gal.



"Space-Saver" for tanks up to 600 gal.

- • remove floating oil — prevent rejects
- • cut brightener costs 20-50% — yet get brighter, smoother deposits
- • increased agitation — allows for faster plating
- • eliminate tank cleaning or downtime

Here's how: **Serfilco systems feature high flow rates with coarse throw-away filter cartridges, usually operating "UNATTENDED" for 10 to 12 weeks without servicing.**

High flow rates provide frequent tank turnover and obtain more uniform temperature control. High pressure pumps increase agitation and throwing power, and obtain the most economical use of the filter media.

ALL UNITS SOLD ON A SATISFACTION GUARANTEED BASIS.

This Type of Filter Also Suitable for Cadmium, Copper, Silver, Iron or Tin

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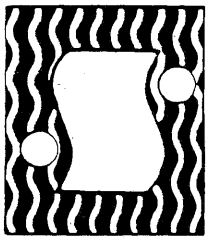

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