
Guest Editorial -For Plateworld.com



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Electroless Nickel Plating and Anodizing Process Recommendations

Chemical Feed pumps

In view of the variety of load sizes and the need for frequent analysis required for control of the constituents consumed or altered during the process of electroless nickel-plating, automatic addition control is recommended. Chemical feed pumps tied to an automatic nickel analysis and pH-monitoring device is recommended to keep the chemical balance within narrow ranges. Using the device will pump the correct amount of each constituent into the plating solution, keeping the chemical balance correct while in use.

There are several manufacturers of these devices. I suggest that the proprietary chemical supplier be contacted for their recommendation as to the best unit and size for the application using their proprietary chemicals. These units are not too expensive, but can do a good job keeping the electroless nickel solution in good working order.

Additional considerations are to balance the areas to be plated in as narrow range as possible. Use dummy panels along with the work pieces if the area of the items to be plated is less than 0.3 sq. ft. per gallon of plating solution. The typical load is 0.6 sq. ft./gal. Most proprietary electroless processes base their recommended replenishment on either 0.5 or 0.6 sq. ft. per gallon.

Anodizing Problems

Due to the wide variation in load size, and the copper contamination problem using copper containing alloy aluminum cathodes, it may be useful to use graphite cathodes. The pros and cons are discussed below.

The usual recommendation for sulfuric acid anodizing processes is 6063 T5. To prevent copper contamination of the sulfuric acid anodize solution, a constant low voltage/current on the cathodes is maintained when not anodizing work parts. (This is seldom practiced in real life, but is often recommended). However, the tradeoff is that the current efficiency using graphite or current is lowered somewhat resulting in slightly higher cost of electricity. (Compared with constant low voltage on the aluminum cathodes, the cost increase is about even.) The use of graphite cathodes would minimize the copper contamination problem to some degree. Copper is dissolved from the work pieces at the beginning of the anodize process.

When using any anodes there are good practices that should be used. Anode to cathode ratio should be nominally 3:1. However when aluminum items that require anodizing, have recessed areas, holes, blind holes, ridges and/or valleys, a higher ration of anode to cathode is recommended, up to a ratio of 5: 1 anode to cathode.

Anode placement with respect to the cathodes should follow these guidelines: The cathodes should be 2-5 inches from the edges of the workload on both ends. Also the cathodes should be 2-5 inches shorter than the workload to assure even distribution of current and prevent "burning" (current flows from the edges of the cathode more than the center areas.)

Using graphite anodes will result in having to use higher starting and ending voltage. The ramp up voltage will likely require 15 to 17 volts at the end of the ramp up and duration of the anodize time. The ramp up voltage should come out to be about 1 volt per minute until it reaches the final voltage above. The starting voltage usually begins at about 7 -9 volts.

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