Technical Service Bulletin

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A Few Tips On Improving The Efficiency Of Your Mechanical Plating Process

(1) Use chemistry from Plating Systems & Technologies, which is not only more efficient with respect to zinc usage, but also costs less.

(2) Use a good grade of zinc. We recommend Purity Zinc products. Because their dust is manufactured from 99.99% pure zinc metal, there is less lead (under 0.002%). Lead has a tendency to form an insoluble lead sulfate film, reducing efficiency by interfering with adhesion. (If you would like additional information on this phenomenon, just give us a call.) Further, Purity Zinc is RoHS-compliant. It isn't really clear to Plating Systems whether zinc made from recycled zinc is RoHS-compliant since lead was intentionally added to precursor materials.

(3) Don't use too much promoter. Using an excess of promoter will reduce the efficiency of the process by slowing it down.

(4) Don't plate at too low a temperature. The optimum temperature for starting the plating is 70º F. to 80º F. If you start at a lower temperature, the efficiency is reduced. In the summer, do not plate at too high a temperature; high temperatures cause the acids in the system to act too quickly on the plating metal.

(5) If you have to add acid to reduce the pH during a run, add sulfuric acid rather than Starter. This is also less expensive.

(6) Check your media to make sure there is not an excess of broken media. We have seen instances where upon receipt the fine media was 15% broken (standard should be less than 5%). We have also seen cases where as much as one-half of the large media was fractured (due to physical damage to the media during plating and/or galvanizing). Careful attention should be paid to barrel speed on larger parts. Larger parts will tend to crush the media if run at too high a speed. If you have broken media, the broken media will abrade off the coating almost as fast as it is plated.

(7) Pay attention to the media to parts ratio and the amount of water in the barrel. If the barrel is underloaded, efficiency suffers. If there is too much water in the barrel, the chemistry is diluted resulting in lower efficiency.

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A Few Tips On Improving The Efficiency Of Your Mechanical Plating Process - Continued

(7a) Make sure that your system has enough fine media. Your fine media should be at least one-eighth of your total media charge. Insufficient fine media leads to low efficiency as well as rough deposits.

(7b) Make sure that you are using - as well as fine beads - the largest media that you can uses, as well. The energy of the large impact media improves the efficiency.

Note: Plating Systems and Technologies has the most complete line of glass impact media for mechanical plating and mechanical galvanizing - 23 sizes from 200 mesh (about 1/400 inch) to 1 inch in diameter.

(8) Be very careful when making extra adds of plating metal. In some shops, operators make extra adds routinely. If the surface area has been calculated carefully and the run has proceeded according to plan, extra adds should not be necessary. This can also keep you avoid difficulties with respect to thread fit problems.

(9) Allow the barrel to run for ten minutes after making the last add to plate out all the metal in the barrel. During this last step, the pH should be kept below 2.5.

(10) Select your zinc plating metal carefully. The smallest mechanical plating metal available is Purity Zinc's UP-515M, with a 5 to 6 micron size. Next is Purity Zinc's UP-6G, with a 6 to 8 micron size. Generally: (1) the larger the zinc dust, the less will be consumed by the acids in the process because there is less surface area as the particle size increases, and (2) the larger the zinc dust, the larger the parts must be in order to create enough energy to flatten the individual zinc dust particles onto the part to be plated. As a general rule, parts that tangle and small fasteners (under 1/4") should use UP-515M, and larger parts may use UP-6G advantageously.

(11) Last, and perhaps most importantly monitor the pH carefully - if the pH rises above 2.5, plating stops, resulting in a substantial loss of efficiency.

(12) Review the historical thickness results. If you have been consistently getting high thickness readings on certain parts, reduce the metal adds proportionately, so that you are not using more zinc than required.

(13) If you have increased your thickness results to compensate for changes from a hexavalent chromate to a trivalent passivate, review the reasons for the change. If it was not necessary (e.g., for chassis assemblies in the automotive market or for other reasons), consider a change back.

(14) Look at other ways to get salt spray performance other than a lot of extra zinc. For example, our HyperGalv deposit (1 mil of zinc plus a chromate plus a leachant-sealant) gives at least twice the salt spray protection of an ASTM Class 50 mechanically galvanized deposit with less than half the zinc. While this process is not RoHS-compliant, it does provide excellent salt spray results.