P&SF Retrospective

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Based on an original article from the early Finishers Think Tank series
[Plating & Surface Finishing, **71** (2), 26 (1984)]

Green tint on brass

Q: ***We get a beautiful yellow upon brass plating on steel, but after a short time a green tint develops. We brass plate in a cyanide bath, rinse, immerse in chromic acid, water rinse and apply a water-based lacquer. Why the green?***

A: The problem may center on the brand or thickness of the water-based lacquer. Many water-based materials are good, but some contain materials that will actually dissolve brass over a period of time. In our own shop, I have seen a lacquer darken a brass hinge overnight.

You might try increasing the thickness of the clear organic coating to a minimum of 12 μm (0.5 mil). You may have to switch to a solvent-based material or an electrocoating process to do this, but if discoloration persists, you should take steps to reduce brass porosity. You could preplate with bright nickel (2.5 μm; 0.1 mil minimum) to improve nucleation and reduce the number of pore sites. However, you should also increase the thickness of the brass to a minimum of 5 μm (0.2 mil). Improved filtration and treatment of the solution with activated carbon to remove organic impurities may be required, because these may trigger pores. An excessive concentration of sodium carbonate also tends to create porosity, so it should be controlled at or below about 75 g/L.

Cobalt analysis

Q: ***What analysis procedure can be used to determine cobalt in an electroless cobalt bath?***

A: The properties of cobalt are very similar to those of nickel. If cobalt is the only metal in the bath, the same methods of analysis can be used. Two simple wet methods can be found in the *Electroplating Engineering Handbook* (A. Kenneth Graham, Van Nostrand-Reinhold Co., New York) and are being sent to you. They require changing the factors to read for cobalt instead of nickel. I would suggest you run a known standard to confirm the numbers.

Alternative methods include atomic absorption, colorimetric techniques, specific ion electrode analysis and ion chromatography. A *P&SF* article written by Y. Okinaka and C. Wolowodiuk in September 1979 shows that polarography can distinguish Co^{+2} from Co^{+3}, an important consideration in the control of cobalt-hardened gold baths.

Paint over chromate

Q: ***Is there any problem painting over zinc electroplate that has a yellow chromate finish?***

A: Actually, a yellow chromate over zinc is often a preferred base for paint, lacquer or varnish. It functions similarly to phosphate coatings by improving the protective properties and resisting separation of the organic coating from undercut corrosion.

Zinc shelf life

Q: ***Can you recommend a low-cost procedure for extending the shelf life of small parts barrel plated with bright zinc?***

A: A clear chromate film applied after barrel plating the zinc will provide improved corrosion resistance during storage, and at modest cost. Alternatively, a clear film applied by immersion in a water dispersion of polymer will improve shelf life. The degree of protection will depend on film thickness, which can be enhanced by increasing the concentration of the dispersion. A combination of the clear chromate film and the polymer coating would provide good protection over long storage periods.

Silver polishing

Q: ***We're producing sheet-silver laser reflectors but having varying success with polishing. Our basic requirement is to achieve 90% minimum reflectivity at 500 to 700 nm. Any suggestions?***

A: In checking with Ken Gatchel, of Lea-Michigan, Grand Rapids, we got this information. The highest luster on silver can be obtained using a domet flannel, full-disc loose buff at 4000 to 5000 surface ft/min with a dry buffing compound, using lamp black as the abrasive. If this type of bar compound is not available, then an all-red iron oxide rouge bar compound will give almost the same luster and may be acceptable.

Anodizing control

Q: ***I understand there is a power-supply system that eliminates the need for accurate surface area calculations prior to anodizing. Any details?***

A: The feature you're thinking of is probably automatic current control. The device that is used requires calibration to produce the desired program of current density vs. voltage using a reference standard of known area. For example, the setting can be made with the first load of parts you're going to run, then the system would adjust to any load thereafter. Once the program is entered into the instrument, subsequent anodizing runs would follow the current vs. voltage program without the need to measure surface area. *P&SF*

The edited preceding article is based on material compiled by Mr. Ronald Kornosky, then of Hager Hinge Co., in Montgomery, AL, as part of the Finishers Think Tank series, which began its long run in this journal 26 years ago. It dealt with everyday production plating problems, many of which are still encountered in the opening years of the 21st century. As we have often said, much has changed . . . but not that much. The reader may benefit both from the information here and the historical perspective as well. For many, it is fascinating to see the analysis required to troubleshoot problems that might be second nature today. In some cases here, words were altered for context.