Got a problem on the finishing line? To send in your question, use the handy, postpaid form on our Readers' Service Card or send a letter to: Finishers' Think Tank, 12644 Research Parkway, Orlando, FL 32826-3298.

Insoluble Anodes for CN Baths Q. What metals can be used as insoluble anodes in silver cyanide and rochelle copper bathe, when we want to reduce the metal concentration?

A. Stainless steel is often used in silver plating baths as an insoluble anode. it's best to use a 300 series alloy to ensure passivity. Stainless steel anodes in a rochelle copper cyanide solution can be the source of chromium ions that will reduce the cathode efficiency. Carbon steel is probably safer.

## Plating Floral Arrangements Q. How can floral arrangements be electroplated?

A. The electroplating of floral arrangements is highly specialized and practiced by only a few companies. The usual procedures start with sealing. Two or more coats of clear lacquer are carefully applied by a spray process to seal pores and improve rigidity.

With one process, a lacquer that contains fine copper particles is applied to make the surface conductive. After drying, the metallized part is plated in a copper sulfate bath, which contains proprietary addition agents to brighten the deposit and keep it smooth. Start with a low voltage (<1 V). Thickness may vary from 0.001 to 0.006 in. Following copper plating, either nickel, silver or gold is deposited, depending on the desired appearance.

Another method uses an activation and sensitization process (after the pores have been sealed with lacquer) followed by electroless copper or nickel, prior to the deposition of copper in a copper sulfate bath. The sensitizing-activating and electroless processes are proprietary.

Stripping & Replating Chromium Q. How can chromium be removed from repaired dies and how should they be replated with chromium? Can you suggest a good book on the subject?

A. An anodic, alkaline stripping process is the most common method used to remove chromium from steel. A solution prepared with 30 to 60 g/L of sodium hydroxide and 20 to 30 g/L of sodium carbonate is suitable. The potential between the steel die and steel cathodes can be 5 or 6 V. The chromium should be removed and replaced before wear or erosion extends to the die-steel surface. Dies should be replated immediately after stripping, rinsing and dipping in a 10 percent, by volume, solution of hydrochloric acid.

A bath containing 300 g/L of chromic acid and 3 g/L of sulfuric acid is a typical chromium plating solution that is operated at 50 to 55° C at a current density of 30 A/dm<sup>2</sup>. Detailed information on stripping and plating chromium can be found in *Modern Electroplating*, edited by F.A. Lowenheim, which can be purchased from the AESF Publications Sales Department.

To obtain an acceptably uniform chromium thickness, it is often necessary to fabricate and use a conforming anode. The anode is preserved and reused whenever the die needs to be replated with chromium.

## Lacquers on Cu Deposits

Q. What can be done to avoid the wear and black spots that develop during service on small copper-plated parts lacquered after thorough rinsing and drying? I'm now using two coats of clear lacquer.

A. Specialists in lacquers and representatives of lacquer supply companies normally recommend a forcedair-dried lacquer to withstand wear. Ask your supplier to suggest a lacquer that is cured at 200° F or above to obtain a hard, durable coating. You will find that the hot-air-dried lacquer is considerably more durable. However, it may also be necessary to increase the thickness of the coating to withstand the wear on the parts you finish. If your current supplier is unable to furnish a suitable forced-air-dried material, you may want to contact other supply companies.

## "Hot Spots" in Chromium

Q. What causes the dull, "hot spots" that appear in the chromium deposit on the lower part of arbors, just below the tooling? Changing the bath eliminates the problem for 3 or 4 weeks.

A. if you control current density while increasing voltage, you may be generating more heat and raising the temperature of the solution adjacent to the plated surface, which could be causing dull spots. Because a change in the ratio of chromic acid to the catalyst could cause dull spots if the current density and temperature balance are borderline, you should check the concentrations of the chromic acid and catalyst.

Look for oxidation products on your rack contacts and clean them, if necessary. if rack contacts are normally cleaned only when the bath is "change d," poor contacts would appear to be the primary cause of your problem. More information on your operation would be required to pinpoint the cause, however.  $\Box$ 

Editor's Note Solutions to this issue's "Think Tank" questions were provided by industry experts through AESF's technical specialists.