



## Finishers' Think Tank

Marty Borruso  
26 Flagship Circle  
Staten Island, NY 10309  
Phone: 1-500/FINISH1  
Internet: dpjh50a@prodigy.com

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### **Powder vs. Electrocoat Finishes Over Brass**

**Q.** To meet market demand, we are considering plating brass—either powder coating or electrocoating—over some of our products currently plated in nickel and chromium. Which is better?

**A.** Brass is very sensitive to tarnishing when subjected to elements in the environment (e.g., airborne contaminants such as sulfur dioxide), so it must be coated with a clear organic finish. It traditionally has been coated with lacquers for tarnish-resistance, but recently—because of problems with VOCs and a need for increased protection—both powder coating and electrocoating have become standard processes.

Powder coating has developed to a point that it is widely used and understood. It can be easily applied in significantly thick, clear coatings that

were problematic just a few years ago. Because powder coating application routines are electrostatic in nature, some components are difficult to coat. Complex parts can result in a "Faraday Cage" effect, where the distribution of the coating is uneven. This can be controlled to a great degree by careful racking and configuration of the parts.

Prior to powder coating, the parts must be dried, and then the coating must be cured in an oven that operates at up to 325 °F. The brass must be protected while it is being cured, either by a benzotriazole coating or by the use of an electrolytic chromate.

(In ovens with high humidities, the chromate will out-perform the organic materials.) Electrocoating, on the other hand, is generally processed in line with the brass, and can be processed wet. A high degree of purification of the systems and rinses is necessary, and control of the process system is ongoing. For the most part, batch electrocoating systems are continuous.

Electrocoating is fairly thin in nature, and the hardness is somewhat less than powder. It should be avoided, therefore, in applications that require maximum abrasion resistance.

Electrocoatings resist salt spray corrosion tests as well as powder, and, as mentioned earlier, the coatings cover the parts evenly with a uniform thickness. Another advantage is that the parts can be coated and processed on the same racks and, with the advent of high-temperature rack coatings, can be baked without further handling.

Although the coating gives some level of protection to the brass during processing and baking, extreme care must be given to the degree of humidity in the oven and the quality of the atmosphere during curing. Curing temperatures and times are comparable in both processes, but the application of clear electrocoating is relatively new, so has fewer points of reference. *P&SF*

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