Finishers' Think Tank



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Plate Less ... Burnish More

As everyone is well aware, the prices for various metals integral to plating have been rising. The trend of years of stable prices has been supplanted by rapid, steep price increases. In turn, the costs related to finishing have dramatically risen, squeezing a tight market to remain competitive. Metal surcharges are becoming as noted as transportation fuel surcharges. These added costs are passed on to a wary consumer, in a tough business cycle. It would be quite a relief to reduce process costs, yet not sacrifice quality.

There are plating jobs that require specific plating deposit thicknesses. These jobs are in a fixed status where it is vital to maintain the correct, as specified thicknesses. Conversely, there are numerous plating jobs that fall under the "bright and shiny" category. It may not be necessary to deposit a previously targeted metal thickness to achieve such a finish. In fact, by maximizing the additive system, dosing appropriately and conducting effective process maintenance, the deposit thickness can be minimized. This will reduce the cost of plating, while enabling a set job to remain competitively priced.

Another surface treatment process focuses on improving the surface condition of the basis metal. In this approach, defects on the surface are removed or minimized, achieving a smooth lustrous condition. This approach employs the most popular of the mass finishing cycles, namely burnishing. When considering economics related to the process cycle, burnishing, if applicable, can provide a significant economic benefit. Any metal is a candidate for burnishing. The process attributes include:

- Usually stamped, drawn or molded parts.
- Produces a bright, smooth, highly reflective surface.
- Removes organic soils and scales, facilitating effective surface preparation before plating.
- Surface metal removal can be minimal.
- The focus is honing and removing surface imperfections.

All of these benefits combine to improve the brightness and leveling of the plated finish. In the case where burnishing is applicable, the plating thickness can be decreased.

Burnishing deals with the distance between high and low points on the surface, or more commonly peaks-to-valleys. The result is instrumentally measured and interpreted as a quantitative value, the RMS (root mean square) value. A lower RMS value corresponds to a flatter or more leveled surface. There are two classifications of burnishing:

1.Burnishing. Parts are processed with media (ceramic or porcelain) or without (part-on-part).

2. Ball burnishing. Softer metals such as aluminum and brass are processed with case hardened steel or stainless steel media, producing maximum brilliance.

Either burnishing cycle can be performed just before transfer to plating. In this case, the parts are already clean, bright and in a ready-to-plate condition. A short soak cleaning to remove burnishing compound residue from the surface is followed by an acid activation prior to plating. A cost reduction in the process is achieved by eliminating a major portion of the typical cleaning and surface activation preplate cycle. Sometimes the parts can be burnished after plating, to achieve the desired brightness. This step saves on plating brightener consumption along with reducing plating time (less metal consumed, increased production throughput). Parts that favor barrel processing are readily transferred with a minimum of handling between steps.

Burnishing compounds are available as liquid and powder concentrates. Either form is prepared as a dilute working solution (0.5 to 1.0 vol% or 1 to 4 oz/gal), as the example concentrations indicate. A good burnishing treatment provides these benefits:

- A lubricating film for action between parts and media to parts. Lubricity is very important.
- Water hardness tolerance
- pH buffered for the application, such as sensitive metals
- Rust and corrosion protection
- Flexible foaming characteristics

The working solutions are prepared and can used to condition parts in most mass finishing equipment, such as barrels (horizontal and oblique) and vibratory tubs. The application in a tub can be with a loading of solution, parts and media, along with sealing the drain. Another form is to meter in the solution per cubic ft/hour, as a single pass or recycled.

There are several benefits to reducing the cost of surface preparation and plating, where the use of burnishing is an appropriate surface treatment. By improving surface quality, burnishing may also improve corrosion and surface life of finished parts. Depending on the application and testing on parts, it may be of benefit to plate less and burnish more. **Past**