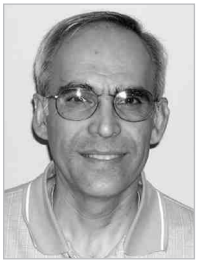
Finisher's Think Tank



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Tips for Keeping Process Baths Optimal During Cold Weather

I sincerely hope that all personnel, companies, and branches of our industry are experiencing the recent economic revival. Fabricators, stampers, and assemblers, are receiving increased orders for parts and finished products. Industries picking up the work include personal care, medical, tools, consumer goods, automotive, and electronic, to name a few. Platers and related finishers are meeting production demands and turnaround schedules, with a renewed optimism in 2004. Suppliers are busier providing the products and services to keep pace with demand for their customers' various finishes. This is a good "busy." I trust it will only get better for us all in this new year. My best wishes to everyone for a safe, profitable, appreciative 2004.

Keep Things in Perspective

We have at some point in our careers been challenged and beset by problems. These usually include a mix of hard to troubleshoot, easy to overlook, a lack of specific consideration, and that old standby—a failure to communicate. What is most important to me is that experience is probably our best teacher. Problems always result in production slowdowns or stoppages. Even finished parts that pass inspection may only be marginally acceptable by routine quality control standards. By keeping things in perspective, we can be more attentive to various problems before they occur, or better yet, prevent them. When problems do occur, the troubleshooting would be more direct leading to quick, effective corrective action. Seasonal conditions also become important factors to acknowledge. Let us review some items that should help keep us focused in the right direction.

Effects of Cold Temperatures

Rinse Water

We are in the middle of winter. Many finishing installations are exposed to the seasonal chill and occasional cold snaps. Water is typically drawn from municipal or well sources. Rinsing characteristics and it's effectiveness get poorer as the water temperature decreases. It's not uncommon to measure water temperatures below 45°F during the winter. This results in films on parts exiting process baths, because of cleaners, acids, and plating solutions, being partially removed in the rinse tank. Accompanying problems to this include finishes that adhere poorly, plating blisters, hazes or streaks in the deposit. Warming the suspect rinse water to sufficiently take out the chill will eliminate this problem.

Cold Parts

These can be a real problem, because they can act as ice cubes do in a hot cup of coffee. For example, nickel plated parts are rinsed prior to immersion in the chrome bath. Along the way, the parts become chilled in the rinse water. Upon initial immersion in the chrome bath, the immediate plating solution is cooler, sometimes to the detriment of plating. This is another example of taking the chill out of rinses.

Zincate

As a whole, zincates (zinc and zinc alloy types), are certainly temperature dependent. Reaction with the aluminum surface and bonding of the zincate film is critical to overall adhesion of subsequent plating deposits. A solution temperature of 65°F is usually a minimum for this important immersion reaction. As the bath temperature decreases, the rate of reaction gets slower. Poor or insufficient zincate formation will spell disaster at the other end of the process line. Surprisingly, many installations disregard or overlook the importance of temperature in zincate solutions. Keep the chill out by warming the solution to the appropriate temperature. Check with your vendor for the right temperature range and the recommended heating equipment. Also, be aware of the importance of storing some of the liquid zincate concentrates. Keep them from freezing. In fact, some of the proprietary products may precipitate

salts that cannot be redissolved. Again, check with your vendor.

The Bright Dip

Usually, this is a solution consisting of approximately 0.25% nitric acid. The purpose is to remove a brightener film, and also neutralize residual alkaline films, activating the surface before immersion in chromate. It may be necessary to warm this solution to permit effective action on the plated surface to properly conditioning it before chromating. Don't forget to maintain the nitric acid strength.

Chromates

In general, all types (on aluminum, zinc, cadmium, or alloy deposits) are temperature critical. Be advised of the same precautions that were discussed in the previous section on zincates.

Phosphates

Iron and zinc phosphates operate best within specific concentration ranges. The respective coating or amorphous gel will be very thin or insignificant below the minimum bath temperature. Therefore, post finishing, such as paint or chromate, will not adhere well.

Liquid Concentrates

Proprietary products that are temperature sensitive will always state this information in the form of appropriate labeling on the drums. This will also be given in the accompanying MSDS. It doesn't take much of a chill to freeze 50% liquid caustic soda (55°F!). Always follow the recommendations for storage and handling of proprietary liquids and generics.

Thermostatic Controls

Overnight, weekend, or per shift shutdowns will result in the cooling of heat-sensitive solutions. Before startup, give sufficient time for heating up process solutions, prior to resumption of their usage. It may take longer to heat up cold solutions. Therefore, reset and calibrate automatic settings for appropriate heat-up times. Check to make sure thermostats are in good working order for this application, and to maintain temperatures during operation. Some baths, such as decorative hexavalent chromium, are very sensitive to temperature. The old rule of thumb for cleaning holds true, especially in winter—cleaning efficiency doubles for every 20° rise in temperature of the bath.

Heat Sources

Boilers should be checked and serviced for use. Be certain there is adequate steam pressure available for plant demands, which usually become more acute during the winter. Heater coils should be checked for any problems, such as accumulated deposits of salts, leaks or etching (anodic or process solution). Electric immersion heaters may require replacement. Be certain solution volumes are maintained for keeping immersion heaters sufficiently covered. Are immersion heaters undersized for the winter demands?

Don't let cold weather and lower than normal temperatures detrimentally affect your process baths. This is the season to keep things a little warmer. The economic upswing will put more demands on productivity. Chill out while those lines run smoothly this winter. ***P&SF***

Do You Have a Question For a *P&SF* Columnist?

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