

# Plating NEWS

2011 Highlights

## Plating NEWS, Spring/Summer 2011

**Advanced Plating Technologies** graciously thanks its readers for a continuing response to the “evolution of man” theme posed in the last 2 issues. It’s in man’s basic nature to change and evolve and plating goes along with it. We like to think we see less of that expression about change, **“but we’ve always done it this way”**.

Let me tell you, I got called on that one more than once since the last issue. It apparently awakened sensitivity to change but thankfully a willingness to see what’s ahead. No kicking or screaming. We took it as a compliment.

Further reader responses targeted the circuit board plating myth exposé. One response was immediate, sharp, critical and something like “OH YEAH????” We of course responded immediately and with enlightenment.

### MYTHS EXPOSED

**Myth: The holes of circuit boards are low current density areas.** FALSE. We were surprised to continue hearing this from the lips of plating people, some of them well respected. They should know better. Contrary to some old beliefs, the holes of circuit boards are NOT low current density areas. The principle reason that copper deposits get thinner in the holes is simply that the holes become starved for copper. It plates out faster in the holes than on the surface because solution movement in the hole is severely limited. More in the next issue.

What has the industry done to minimize this problem? Many have gradually reduced the overall current density of the cathode to ridiculously low levels. Less than 10 a.s.f. (1.08 a.s.d.) Plating at low current densities allows the circuit board plater to squeak by on copper distribution in the hole. The reason: there is more time for fresh solution to get into the hole to replenish the copper while simultaneously there’s less copper being piled up the surface of the board. This leads to another plating myth:

**Myth: Isolated traces on a board surface will drastically overplate.** FALSE. How many dot patterns, copper borders, miscellaneous tapes and ancillary things have been used to counteract this problem? Plating people say “Hey, the evidence is there. Look at the thickness!” Indeed, some of the deposits not only look burned but are burned, amorphous, thick and quite useless deposits. The reasons are a little more complex.

It’s not because these traces are isolated that they overplate. They don’t have enough cathode mass to do that. They overplate because underlying copper areas in many multilayer board structures influence their ability to draw more current on the surface. These areas comprise the innerlayers of circuit boards. They are not “plating” up but are nonetheless a component of the electrical field in the deposition process on the surface.

CAM data knows all this and indeed identifies the platable area on the surface of the board too. Taking into account the innerlayer copper influence on outerlayer surface plating is seldom considered. There needs to be a confluence of circuit board plating engineers, CAM data people and electrochemical intelligence derived from plating models to fix this. The attainable goal: improved plating thickness uniformity and in half the time.

### BRACING FOR BACKLASH

We were bracing for backlash on the union reference in the last issue of Plating NEWS. We got none. That issue being the change of plating fixtures to achieve higher productivity. Although it happened long ago, in hindsight would they have behaved differently if they knew that change had to occur or they would be out of jobs? We want to know. Similar struggles are going on right now with hard chrome plating in certain aircraft/aerospace circles. How fast should change occur? How fast will change occur? We invite your comments.

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Since we were braced for some backlash we actually got some but it came from an unexpected source. The reference to the "Kiss of Death" scenario elicited the question from one reader: "Were you talking about me in that story regarding the comment from the back of the room?" Our answer: "Well, actually no but now that you mention it". If you haven't read the last issue of Plating NEWS then this might not be making any sense. Briefly, a plater resistant to change voiced an objection, thinking that the new fangled plating technology tool being discussed would stumble on the parts he was plating. Our reminder: "it doesn't matter what the part is".

It's a little frustrating but it says that the application of electrochemical intelligence via computer modeling is still not completely understood by some. Plating is not witches brew chemistry and the smarter we get about it the better off we will be. The era of Smart Cathode Shields will emerge too. More in the next issue.

## SUR/FIN, JUNE 13-15, 2011

NASF is putting on a nice SUR/FIN Conference this year in Rosemont, IL. We like to recommend that you look into all things "new" in plating when going to these conferences. Suggested exhibitors:

**Elsyca, Booth #918** - Elsyca always has information on the latest application of Electrochemical Intelligence. In a technical session Mr. Robrecht Bellis will present "**Computational Optimization of Ecoating for Vehicles**". Enhanced understanding of the application of electrochemical intelligence never fails to trigger thoughts of improvement in one's own plating process environment. Don't miss out. Wednesday, June 15, 2:00 PM, ASETS Defense DoD, Session 12: Protective Coatings, Room 14

**Digital Matrix, Booth #637** – Welcome to a "new" old player in electrodeposition technology, a manufacturer of precision plating equipment. You KNOW how we love precision plating around here. Digital Matrix has served many industries including: *diffusers, sensors, holography, bio-tech, optical disc, printed wiring boards, semiconductors, back light panels, flat panel displays, refractive reflectors, MEMS, Nano, (LIGA) and the Organic Light Emitting Diodes (OLED) industries.*

## ALOHA!

**Advanced Plating Technologies** says Aloha to long time colleague and friend Roger Stearns of Rolyann & Associates. Roger was an advisor to EIMC – Advanced Plating Technologies. We worked on many things "plating" over the years. He was largely retired but he marveled at the prospect of the plating changes made possible by advancing technologies. His passing leaves a void since he contributed greatly to plating innovations throughout his career with a "common sense" approach to innovation and change.

**Aloha to Werner!** We regret the sudden passing of Werner Englemaier in the interconnect industry. He's a household name in circuit boards and had a unique multi-disciplined background enabling him to successfully address electronic packaging problems from a system's point-of-view. He "enlightened" me on copper deposits.

## THANKS FOR READING

This edition of Plating NEWS has been written and edited by Roger Mouton and Staff at EIMC – Advanced Plating Technologies. We welcome submissions for publication in future issues of Plating NEWS.

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