# Plating NEWS

2013 Highlights

**Spring/Summer 2013**

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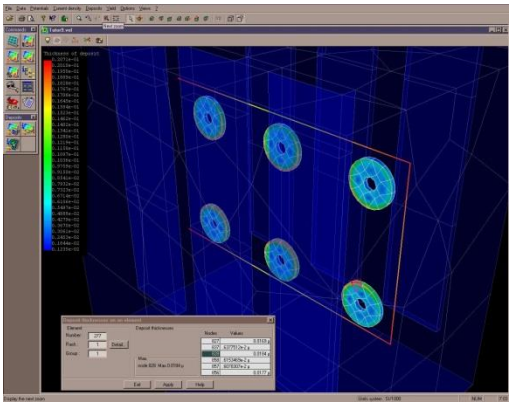
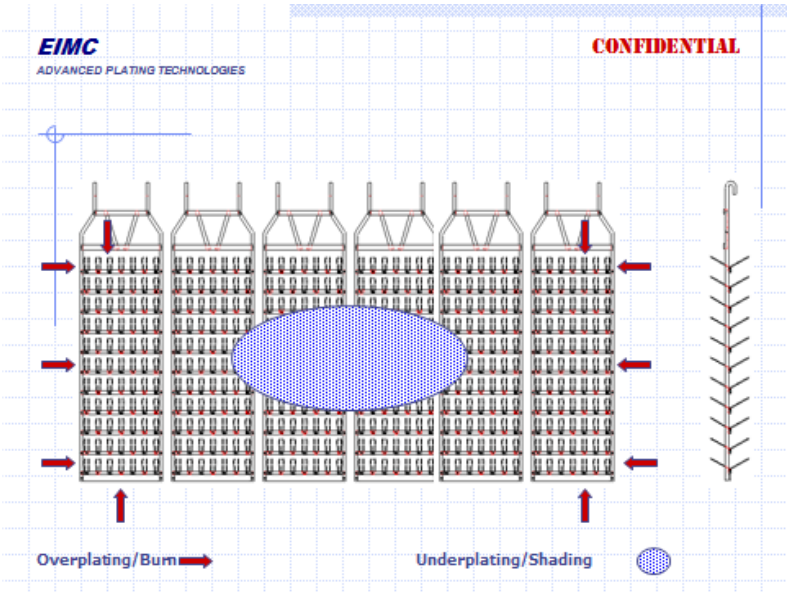
## Smart Cathode Shields



There's a plating shield in this graphic representation of a plating model. It's not real easy to see. The point is that it's not necessary to use a computer model to make a smart plating shield that will benefit the user. A little trial and error can produce significantly better plating results in terms of plating thickness uniformity on a plating rack.

Plating racks, especially large ones (like several plating racks together on a flight bar, for example) can exhibit the worst in plating thickness uniformity. There's usually heavy plating thickness or even burning on the ends, especially the corners, and shading toward the center.




A little trial and error by imposing simple shields or barriers can fix a situation like the one above. All the available plating current still goes into the cell, it's simply redirected. "Shading" begins to go away.

## Innovation

Is innovation in our DNA? It's an interesting question! If it is not in our DNA then how do we come by it? The circumstances by which innovations have occurred in history are probably as varied as the number of innovations themselves. Innovations are not necessarily obvious. It took thousands of years before a common yolk, fastened to the necks of oxen, was used to enable them to pull together. Their combined output became more than 2X.

Sometimes innovations are the result of accidents. A simple mistake made in the maintenance addition to a chemical process can have enormous effects on the outcome of a process, as in the discovery of the micro-crystalline phosphate coating that eventually revolutionized the paint coatings industry via a simple but significant surface preparation change. Yes, stuff like this happens in plating too.

If we have any appreciable electrolytic background then we all can tell stories of one sort or other about plating distribution anomalies. It was legend in the South that an obscure plant maintenance engineer/rack maker could improve plating thickness distribution on a large flight bar carrying multiple plating racks by hanging a metallic object(s), without any electrical contact, in the anode/cathode field(s).

That's "witches brew" chemistry if ever I saw it but this method worked to an extent. A little trial and error refined it a bit. The guy initially discovered the trick after some routine maintenance procedures resulted in a wrench being left wedged onto a protruding, plastisol coated part of the rack. Somehow it made its way through the entire plating process, non-electrolytically.

Of course the wrench had something of a micro-thin deposit on it. It was in the "field". But the effect that this non-electrolytic, or shall we say, non-electrified metal object had on surrounding parts was notable too. It robbed only slightly without being connected cathodically but it also appeared to disrupt the normal electrolytic field between the anodes and the real parts. There was enough disruption to present slight cosmetic differences. These then led to discovery of the plating thickness distribution changes. The accident came because a "cosmetic" effect of something unintended presented an opportunity for positive change. Now the bad news……..

The innovative, obscure rack maker that figured this out left the company, the industry and retired. He was fairly old when he started doing it anyway. Alas, no one could ever follow in his footsteps. His secrets were that, as a plating process engineer, he did a LOT of trial and error and he also paid attention.

Electrolytic plating process engineering on this level doesn't have to be intuitive or trial and error. Fortunately there is Electrochemical Intelligence, available with products and services by Elsyca and PlatingMaster.

***"But We've Always Done It This Way"*** In our last issue of Plating NEWS we mentioned the occasionally heard expression, *"but we've always done it this way".* Fortunately, it doesn't always imply resistance to change but it got additional responses. A few readers suggested it isn't just plating where resistance to change occurs, it's pervasive in many of our other, perhaps older, manufacturing environments also. It is indeed.

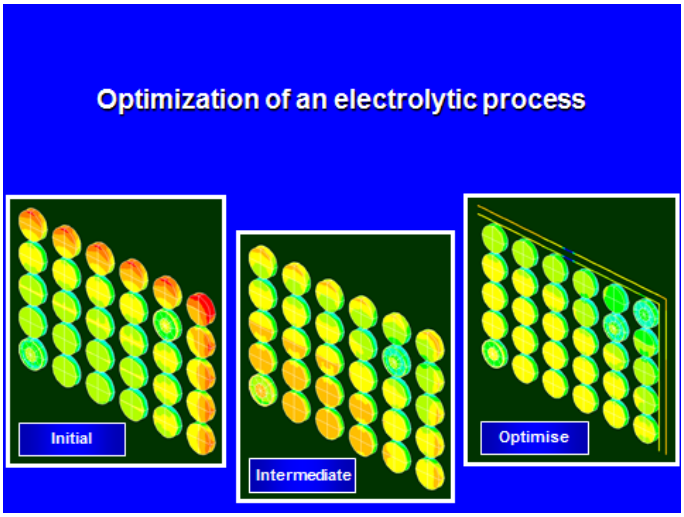
While we won't venture outside the electrolytic process environment in this Issue we hope you'll think about those other areas because they will play into your future plans for electrolytic process improvement. If there are good things happening elsewhere in your manufacturing environment they likely will effect plating as well.

***Manufacturing Department Interactions*** We're always pleased to tell success stories where process improvement is made possible by wisely applying advanced electrochemical intelligence to problem solving.

Picture an automobile engine manufacturer turning out hundreds of thousands of engine pulleys that require simple rack zinc electroplating before being painted. Problem. Final Assembly has been rejecting a significant number of engines because their vibrations are out of required specifications. The investigations begin.

Engine pulleys are isolated. Machining says the pulleys meet spec. before they are sent to plating. Plating "plates" them believing the deposits are of uniform thickness and sends them for inspection. Spin balance failures! Significant failures caused by just a little bit of overplating on specific areas of the plating fixtures.

Properly applied electrochemical intelligence solved this problem with significant benefits to several of the manufacturing departments: Final assembly was quite happy. The plating department benefitted immensely in several areas: better efficiency, greater through-put and significant cost reductions.




There's additional information on this case study in the paper presented at SURFIN in Nashville. It was awarded Best Presentation in Conference and is available in the Downloads section of www.smartcatshield.com

## SURFIN Conference

NASF recently held its annual SURFIN Conference in Rosemont, IL June 10-12. Elsyca was well represented with 4 technical presentations. This resulted in a lot of traffic at the booth. TRW's Mr. Gerd Reineck presented how they joined forces with Elsyca to redesign tooling and racking of the decorative part of a steering wheel to ensure plating specifications were met in high volume production. The steering wheel was displayed in the presentation as well as the booth. It was a nice "touchy feely". Alan Rose, Bart Vanden Bossche and Robrecht Belis attended from Elsyca.

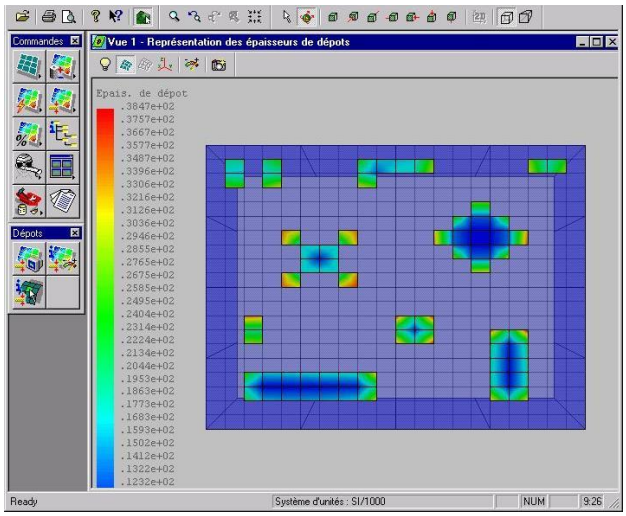
It was nice to visit with current and former colleagues and associates. The surface finishing industry exhibited some vitality that hasn't been seen in years past. And some of the SURFIN attendees are now full-fledged proponents of computer modeling of their electrolytic processing. They've reaped the benefits of using electrochemical intelligence for improvement of their respective processes.

### People

From the beginnings of our exposure to industry and surface finishing we've all been influenced one way or another by people we met along the way. First for me would be a great uncle who had a knack for extracting and purifying things from bulk chemical solutions. He always talked to me about being in the chemical industry. I found myself in a few plating shops at a very young age. His name was Philip Guidry.

Jump ahead to 1998. Michael Moisan, wherever he is today. I remember walking down the hall past his office in a large pwb production facility. He saw me go by and asked me in to say, "Roger, don't you know something about plating?" I responded "Well, yes, what's up?" "Well, it's these multilayer boards. We've trashed them."

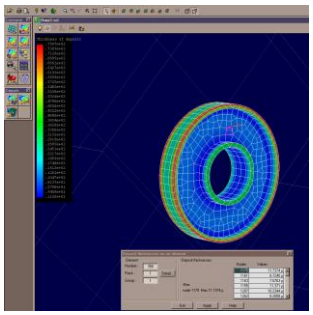
Trashed them indeed. I can say it now…I think. IBM boards. Tough to plate. Multilayers, small holes, very busy surface features. One mil. plating thickness for acid copper was spec'd. The actual production plating thickness distribution was 3.2 mils at the worst and 0.8 mils. at the thinnest. On the same board. VERY expensive boards I might add. I was asked why this was happening and that started what seems now to be a life-long quest to seek out plating thickness uniformity.

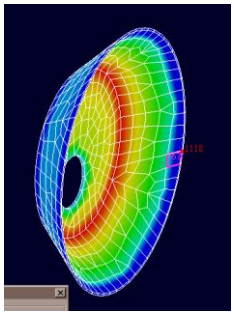


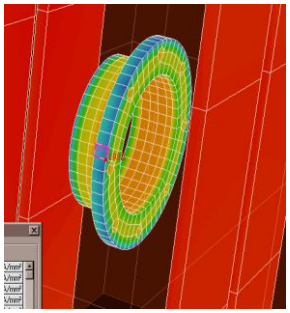

The graphic here is a simulation plating model of one of the problem boards with one major difference: the darker blue border is the model of a simple shield around the perimeter of the board.

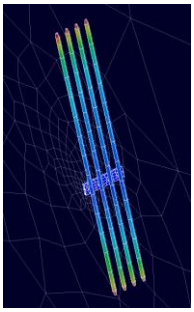
Plating thickness distribution was greatly improved……in the model. In actual production we understand there have been some successful practical applications of simple shields via trial and error.

Some of our reader mail suggests we put more graphics into this Newsletter. It is said they stimulate our readers to creative plating thoughts. What do you think? It does a different take on "plating".









## 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.

**EIMC - Advanced Plating Technologies - www.smartcatshield.com**

We're a source for electrolytic process optimization

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