Reader Comments

Letters to the Editor:

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About "Advice & Counsel"

Dear Frank:

I read your column in the September issue of P&SF with some interest. I guess the drop test you describe is the ultimate "quick & dirty" form of the BNF Jet Test, which formed the basis of several British Standards long ago. It was dropped, and rightly so, because there were too many uncontrolled variables (mainly temperature ...) and has been superseded by coulometric methods. A guy would have to be pretty mean, skint or maybe desperate to rely on this sort of test. I wouldn't want my work plated by anyone relying on this.

The BNF (British Non-Ferrous Metals Research Association) Jet Tester was essentially a dropping funnel mounted on a simple laboratory stand. The outlet was connected, via rubber or plastic connectors, to a fine glass jet. The thickness measurement standards based on this very simple apparatus specified the distance of the jet tip from the test surface, and the dimensions of the jet. A range of test solutions were also prescribed for use with whatever plated metal was on test.

The dropping funnel tap was opened and the time for the acid test solution to penetrate through to the substrate formed the basis of the method. Various shortcomings included lack of temperature control and uncertainty in determining the end-point. The technique was almost certainly the precursor to coulometric thickness testing, which is still used today, indeed some of the test solutions were quite similar. It is well know that many electroplated coatings, including chromium and zinc, for example, corrode at different rates depending on the deposition electrolytes and conditions used in their plating (including the age of the bath). Papers describing this are abstracted at www.surfacequery.com. While the Jet Test was unable to correct for such differences, the coulometric method where the end-point is potentiometrically determined, and thickness is measured not in terms of time, but rather coulombic charge passed, is almost immune to such effects.

Moving on to micro-sectioning, easily the most impressive treatment I have ever come across was in a recently published German book by Professor Kanani, who described (over some 10 pages or more) the theory of thickness measurement using vertical sections, oblique sections and, most accurate of all, cup-shaped sections. This book has been translated and will be published in the U.S. by Elsevier around December 2004.

Kind regards and keep up your always stimulating column.

Dr. Anselm Kuhn Metal Finishing Information Services Stevenage, Herts, UK

Dear Anselm:

I agree with your opinion on the drop test. I only have one die-hard client still using it on a barrel line to get a quick read on zinc over steel. His line operator is pretty good at using it.

Thank you for the information and kind comments on my articles.

Frank Altmayer, MSF Scientific Control Labs Chicago, IL

About "Finishers' Think Tank"

Dear Steve:

I was interested in your article "New Twist to an Old Song" in the September issue of *P&SF*. But, truthfully, disappointed, too. You're telling us that iron phosphating could be replaced by "new technology," and that could well be the case. But, you're not telling us what that "new technology" is or where we can get it. You say the new technology has been patented, but not by whom ...

You're telling us something is out there, but you're not going to tell us what it is?

What can this new technology be? There are hundreds of patents for alternative conversion coatings, many based on use of hafnium, titanium or zirconium, usually with organic resins. But, most of these include fluorides. So, I guest that rules them out, since, as you write, "these include the absence of ..." So, are you, I wonder, referring to the so-called "organic metals" of which the best known is branded Ormecon (www.ormecon.de). These are intrinsically electrically conducted polymers, such as polyphenylamines and they appear to perform extremely well. They're not exactly new. They've been around almost 10 years. However, while phosphates are cheap as dirt, these "organic metals" (if that's what you are referring to) are definitely "fine chemicals" and in a totally different cost league, which is not to say there is no place for them.

I'd say most readers of *P&SF* have at least some grasp of chemistry ... Finishers are technologists operating in a science-based industry, and surely deserve better than (unspecified claims for "new technology").

Dr. Anselm Kuhn Metal Finishing Information Services Stevenage, Herts, UK



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