

**MATERION**

**MICROELECTRONICS & SERVICES**



*Adding Value to Precious Metals...*

June 2013

**Thin Film Deposition  
Materials and  
Electronic  
Packaging Products**

## Managing Precious Metal Mass Balance

*Full Accountability and Cost Reduction*

Achieving full precious metal accountability and reducing costs are of key importance to our customers in managing mass balance. Materion Best Practice Audits are just one of the ways we identify all precious metals usage and provide guidance for lowest cost of ownership modeling. We can manage your full mass balance of PVD tools including targets, refine streams, shield recovery, parts cleaning and refining services.



### Assistance Offered

With our 100 years of experience in refining, recycling and recovery of precious metals, we have unique expertise in managing metal life cycles from Consumption (product) to Recovery (shield/refining). We are able to:

- analyze data to maximize recovery and offer higher precious metal returns from the deposition loss stream
- provide a refine summary for each kit to better understand where each tool is consuming precious metals
- deliver a full report with our recommendations for full PM accountability and cost reduction initiatives
- offer parts cleaning and refining to support a full mass balance approach
- account for amount of precious metal return from shield cleaning

Read more about [Precious Metal Mass Balance...](#)

## Gold Spitting - Materion Presents Potential Solutions

*What factors contribute to spitting and what can prevent it?*

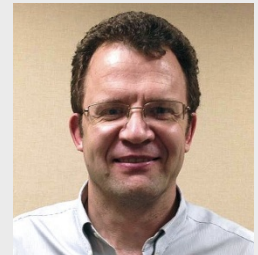
In This Issue

[Nonmagnetic Lids](#)  
[Ultra Pure Gold](#)  
[Silver Casting Grain](#)  
[New Applications Lab](#)  
[Gold Spitting](#)



[Contact Us](#)  
[www.materion.com](http://www.materion.com)

### Face-to-Face Around Materion



Materion  
welcomes **Dr.**  
**David Van Heerden,**  
our new Applications  
Engineer, who will  
primarily be



Dr. Alan Duckham in front of his "Best Poster" as chosen by CS Mantech attendees

The common industry problem known as "gold spitting" during evaporation was addressed by Sr. Scientist, Dr. Alan Duckham of Materion Microelectronics & Services, who offered potential solutions during his presentation at the CS Mantech Conference in New Orleans.

### Paper Covers Gold Spitting Contributing Factors

In [Developing a Fundamental Understanding of Gold Spitting During Evaporation](#), Dr. Duckham considers factors that can contribute to gold "spitting." During evaporation processes, and in particular, the process of being deposited as a thin film onto a semiconductor wafer, gold can be prone to eject droplets that solidify into solid particles on the wafer, otherwise known as spitting.

### Top Recognition in Poster Session

In the Poster Session of the Show, Dr. Duckham's presentation was honored as the "Best Poster Award" by ballot vote of conference attendees. The popular poster generated much traffic and numerous discussions with process engineers from the compound semiconductor industry regarding how gold spitting can impact sputtering yields and product quality. [Read more on gold spitting...](#)

## New PVD Materials Applications Laboratory

*Partnering with Customers to Solve Coatings Issues*

"The launch of the customer-focused Applications Laboratory will expand Materion's collaboration with our customers," says Richard Koba, Marketing Manager for the lab. "It will offer an avenue to address challenging technical issues, as well as provide opportunities for joint development of new (PVD) materials. Customers are encouraged to reach out directly and partner with our applications engineers to solve their PVD material concerns."



Operation of the KLA-Tencor Surfscan 6420

### Purpose of the Lab

The Applications Laboratory at the Westford facility will serve three functions: produce coatings for customer evaluations of PVD materials; promote customer education/collaboration; and support Materion internal R&D. The laboratory features thin film equipment, such as a sputtering

responsible for partnering with our PVD customers and acting as their technical resource. Reporting directly to Chris Pakrad, Director of Marketing, David will be working from several Materion facilities including Brewster, Buffalo and Westford, MA.

David brings with him a wealth of experience in a wide variety of materials systems including nanomaterials, electronic ceramics, bonding and joining. His career embraced such positions as Principal Applications/Materials Engineer, Principal Metallurgist and various Director roles in Research & Development. His impressive educational background comprises a BS (Chemistry and Physics), MS (Applied Science/Materials) and PhD in Materials Engineering all from the Univ of Cape Town, South Africa. [Read more about David Van Heerden...](#)

system with a 150mm diameter target and an electron beam box coater. It also contains a wide range of thin film characterization equipment, including a KLA-Tencor Surfscan 6420, which measures the surface topology (particles) on deposited films. [Read more on the new Applications Lab...](#)

## Sterling Silver Casting Grain

*Process for Quality Products*



Silver Casting Grain

One of the key ingredients to producing the highest quality silver finished parts for our customers is to begin with the best possible starting material. Materion's refining methods for silver remove or lower elements that negatively impact the casting process. Our Best Practices ensure that silver content is met, impurities are kept out of the process and oxygen is reduced to a low level.

### Investment Casting and Sterling Silver Casting Grain

Sterling silver casting grain is employed in a process called investment casting. Dating back over 5,000 years, it is often called "Lost Wax" casting because the wax used to form within the cavity is "lost" each time. Investment casting delivers a very high quality replication of the designer's original art work. To produce quality finished parts, the starting material must meet the same high standard. [More on sterling silver casting grain...](#)

## Ultra-Pure Gold!

*Materion's 99.999% Purity Level*

We are one of a handful of companies able to consistently refine gold to the 99.999% purity level as required by some of the most advanced high tech companies. The largest use of these high-purity source materials is in the production of thin films using physical vapor deposition (PVD). In PVD processes, the film is formed by atoms transferring directly from the source through a gas phase and onto the substrate. The two technologies utilized most frequently for these PVD processes are e-beam evaporation and sputtering.



## Sales Specialists Enhance Customer Experience



Two Specialists have been added to Materion's Advanced Materials Group, Regional Sales Department. that will significantly enhance customer service to its smaller but critical accounts. These customers collectively represent an important part of Materion's business, and the new Specialists will focus primarily on their needs.

### Responding to Customers

As a result of feedback from a Net Promoter survey last year, Materion took a number of steps to ensure that all size customers would be pleased with their level of service. One of these actions was the recent hiring of

## Gold Spitting Problem

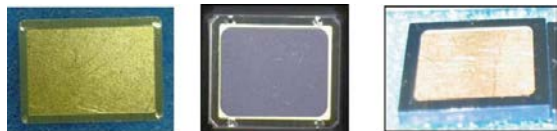
During evaporation processes, and in particular, the process of being deposited as a thin film onto a semiconductor wafer, gold can be prone to eject droplets that solidify into solid particles on the wafer. This can lead to improper functioning of a microelectronic circuit and even require the scrapping of whole production lots.

We have been very successful in reducing this behavior, called "spitting."

[Read more about our ultra pure gold...](#)

## Nonmagnetic Combo Lids

*When you need an alternative.*



*Materion produces Nonmagnetic lids for a variety of applications.*

The packaging industry required a more robust metal material which could perform like Materion's regular Combo Lid™ while at the same time being nonmagnetic. So, we developed a number of

options customers could select to suit their packaging applications.

### Why Nonmagnetic is Necessary

There are a number of reasons that customers need nonmagnetic properties in lids. A primary one is that magnetic properties can create noise during electronic signal processing. Also, components within a package are in communication with other devices, and the magnetic field from the metal cover could interfere with the signals. To avoid the signal losses or interference, nonmagnetic material is necessary to replace the current composition of the Combo Lid™ which is made up of iron (Fe) and nickel (Ni)- based alloy.

### Nonmagnetic Lid Options

To meet the demand for an alternative, we developed a number of nonmagnetic lids for a broad range of applications. The problem was to metallize the nonmagnetic lid with suitable metals that are also nonmagnetic - and yet solderable with gold-tin alloy. We were able to meet the challenge and now offer various options. Al<sub>2</sub>O<sub>3</sub> or ceramic lid with gold-tin preform attached

- \* Molybdenum-based combo lid gold-tin preform attached
- \* Beryllium-Copper combo lid with gold-tin preform attached
- \* Copper and Tungsten-based alloy with gold-tin preform attached
- \* Bronze alloy with gold-tin preform attached.

experienced and knowledgeable sales professionals, Lorraine Saldanha in Newburyport, MA and Christopher Helwig in Milwaukee, WI, to fill Specialists positions. [Read more about our Sales Specialists...](#)

*Join us for a cup of coffee...*



**at the  
[International  
Precious Metals  
Institute \(IPMI\)  
Conference](#)**

**June 22-25  
JW Marriott Desert  
Ridge Resort &  
Spa  
Phoenix, AZ**

*...Materion is supporting a coffee break...see you there!*

## Ceramic Combo Lids

Materion ceramic combo lids are newly incorporated into our packaging family. Ceramic is a non-metal and is classified as nonmagnetic in its purest form. However, the challenge is to metallize the ceramic in order to accept solder preforms necessary to provide hermetic seal performance. Materion succeeded in meeting this requirement. [Read more on nonmagnetic lids...](#)



[Questions? A topic we can address in this Newsletter? Click here!](#)

### MATERION MICROELECTRONICS & SERVICES

2978 Main Street  
Buffalo, NY 14214  
Phone: +1 716.837.1000  
[www.materion.com/microelectronics](http://www.materion.com/microelectronics)

USA: +1 716.837.1000

Europe: +44 0 488.686056

Asia: +65 6559.4450



Copyright © 2013  
All Rights Reserved.

[Forward this email](#)



This email was sent to jo-anna.moscati@materion.com by [susan.doughtie@materion.com](mailto:susan.doughtie@materion.com) | [Update Profile/Email Address](#) | Instant removal with [SafeUnsubscribe™](#) | [Privacy Policy](#).  
Materion | 2978 Main Street | Buffalo | NY | 14214



Try it FREE today.