

Stats & Chats

Essential Information from our Industry Experts

Customizable Materials and
Precious Metals Management

September 2013

Copper Parts Cleaning

Materion's Cost Effective Chemical Process

Currently, there is a very low or no precious metal recovery from cleaning copper crucibles. Responding to customer need for an improved return, Materion is developing a new copper parts cleaning service. This service will particularly support the requirements of the compound semiconductor industry.

Physical Removal of Precious Metal

Traditionally, precious metal like gold (Au) is removed physically. Parts to be cleaned, such as crucibles, top plates, V plates, or other customer specific parts, go through a machining process. The disadvantage with this mechanical approach is that remaining parts are damaged or scrapped as there is no option to retain usable parts.

Unique Chemical Cleaning Process

The advantage of the new chemical process is that it does not attack the copper or copper alloy surface. It has been developed to remove only the deposition layer. The mechanical process is still used to remove the bulk of the precious metal material prior to the chemical process. But the advantage of a dual approach (physical cleaning followed by Materion's new chemical process), is that we are able to increase the salvage of precious metals. [More about our chemical cleaning process...](#)

Target Bonding Issues

Materion Provides Solutions



One of the key parameters that determine the performance of sputtering targets is the integrity of the bond between the sputtering target and the backing plate. This bond can be critical to the performance and cost of the sputtering target. Studies have shown that bonded sputtering targets produce a more uniform deposition and demonstrate reduced target cracking at

higher deposition power densities.

Maximizing Performance

As a leading supplier of sputtering targets to the semiconductor, optical coatings, LED, photonics, data storage, wireless, military, and medical industries, Materion's customers depend on our bonding expertise. We are able to both supply the high quality traditional and custom alloy materials necessary for superior deposition, as well as maximize material performance in the manufacturing environment.

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Face-to-Face Around Materion



Materion welcomes **Lawrence Luke**, our new PVD Applications Engineer, who began his new position in April at our Westford, MA Laboratory after two years at Materion Barr. Lawrence will be responsible for understanding the requirements of our PVD customers and assisting them with product/process solutions. He reports to Dr.

Producing Quality Bonds

The requirements for successful bonding are demanding. The bond must exhibit a low thermal resistance so that the highest possible power density can be applied to the target without the target overheating and cracking. There must also be minimal voiding in the bond to avoid hot spots which can be associated with cracking and non-uniform deposition. To reduce the cost of ownership of the target assembly, it is important that the bond can be easily taken apart (reworked), so that the backing plate can be reused. [Read about bond strength and flexibility...](#)

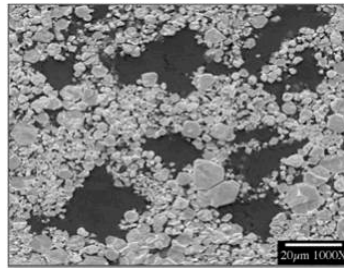
Powder Processing of Sputtering Targets

Advantages that Improve Performance

Sputtering targets are typically manufactured at Materion using either melt or powder processing. Each approach offers unique capabilities and manufacturing advantages. Here we will concentrate on powder processing, a technique that offers significant advantages in the manufacture of targets.

High Material Utilization with Powder Atomization

Advantages include microstructural tailoring that can significantly improve sputtering performance, as well as the manufacture of targets from materials that do not lend themselves to other processing methods. Powder processing also allows high material utilization - an important cost factor when processing high cost material systems.



Titanium-Tungsten sputter target material produced by powder processing.

Powder Processing Advantages

In powder processing, articles are manufactured by the sintering and densification of powder starter materials at elevated temperatures. The driving force for this process is minimization of the energy of the material by reduction of the large surface area associated with powders. [Read about a variety of powder processing advantages...](#)

Innovative Ceramic Combo-Lid

Features Selectively Metalized Seal Ring



As the industry's cover lid innovator, Materion manufactures a variety of high performance hermetic lids to meet your microelectronic packaging application whether for the semiconductor, MEMS, medical, or optical market. In response to customer requirements for a non-magnetic hermetic cover that could be metalized, we developed the Ceramic Combo-Lid.

A variety of elements must come together to manufacture the new Lid. Our metallization process creates effective organic free seal rings that allow excellent soldering, while a gold-tin alloy delivers perfect hermetic sealing. Other non-precious and lead-free soldering can also be used. In addition, Materion can produce edge

Alan Duckham, Senior Scientist, and is focused on modifying or developing improved thin film deposition processes.

Lawrence is looking forward to the challenges posed by working in the Applications Lab. He feels that, "It will provide a unique opportunity to develop relationships with customers and obtain insight into what they are developing." This provides a useful sense of the direction technology is taking and what role Materion can play.

Lawrence also commented about his new job, "This is more than just a new service provided; in some ways, it's a barometer for emergent technologies."

[Read more...](#)

Materion ISO-Recertified



Materion has recently completed recertification for ISO 17025 (Laboratory), ISO 9001 (Quality) and ISO 14001 (EHS) to ensure we are meeting the quality needs of our customers as well as complying with all regulatory requirements. The ISO series is a set of universally accepted international standards related to quality management systems that

metallization. This unique feature assures high performance and quality of the sealed packages at the customer end.

Customized Ceramic Combo-Lids

Materion is tooled for over 15,000 preform shapes which allow us to custom-design and manufacture the new Ceramic Combo-Lid™ to meet specific customer requirements. The lids are available in a variety of shapes, sizes, materials and configurations. Materion also offers the service of tack welding solder preforms onto ceramic lids. [Read more about the ceramic combo-lid...](#)

Starter Sources

Customized Evaporation Solutions

Materion is supporting a trend towards replacing traditional electron beam evaporation slugs with solid custom-designed starter sources. These starter sources offer our customers several unique advantages over evaporation slugs. They provide customers with a competitive cost model that lowers cost of ownership by increasing yields and minimizing downtime.



Creating Starter Source Designs

Materion is a leading supplier of evaporation materials including slugs, pellets, disks, random pieces, crucible liners, and starter sources. Working closely with OEMs and end use customers, Materion has developed innovative evaporation products to reduce spitting, increase yields, and facilitate preferred film properties and rates of deposition.

To develop customized starter source designs, Materion engineers work closely with customers in a rapid development environment. We have manufactured over 80 starter charge designs in over 24 unique compositions and alloys. Critical dimensions for design include outer diameter, thickness, angle, inner diameter, radius, and any other pocket, step or custom-machining. Typical compositions include Ni, Ti, Al, Cr, Cu, and other custom alloys. Materion's current production volume is thousands of starter sources per year. [Read more about our Starter Sources...](#)

Emerging Medical Trends

Materion Poised to Support Market



Mobile Health Monitor

The global healthcare market is estimated to be \$6 trillion in 2013 and is expected to reach \$12 trillion over the next decade. The pace of growth over a relatively short time offers abundant opportunities for manufacturers to offer products to satisfy new demands. As an advanced materials supplier to both the medical device and semiconductor industry, Materion is in a unique position to anticipate customer requirements in the emerging medical market.

cover best practices in technical competence, quality, EHS and other areas. They serve as formal recognition of a demonstration of competence.

For close to twenty years, Materion has chosen to be audited and certified to ISO by a third-party qualifying body. [Read more...](#)

Full Service Closed Loop - Providing Customer Value



Precious metal customers can reduce their cost of ownership through Materion's "Full Service Closed Loop." Instead of the purchase of metal being your only and final transaction, we provide a program that saves money and offers other advantages.

How it Works - Targets & Evaporation Materials:

To understand the "closed loop" approach, it is important to understand that only 25% of the material in a target is actually used during the sputtering process, 75% remains. With a closed loop, that remaining precious metal goes into the customer's "metal

Stage Set for Rapid Global Growth

The massive rise in projected healthcare spending can be directly attributed to an aging global population and growing household incomes. The United States spends roughly \$8,600 per capita or 17% of GDP on healthcare costs. In most European countries, Canada and Japan, roughly \$3,000 per capita or 8% of GDP is spent on healthcare.

Contrast this to China, where only \$19 per capita is currently spent on healthcare. China is predicting that over the next decade their healthcare spending will grow from \$19 to \$169 per capita. While this is relatively small compared to the developed nations, for a country with over 1.3 billion citizens, it represents a nine-fold increase in healthcare spending! Read more about [Materion and its role in the expanding medical industry...](#)

Providing Value by Leveraging Industry Experts

Helping Customers Achieve Optimal Solutions



We recognize that our customers design sophisticated products and support demanding markets. To keep pace with rapidly changing needs, Materion employs a wide range of industry experts to assist current and future

customers. For each of our major Products and Services, we have experts available to assist with your challenges:

- * [PVD Application Engineering](#) and Lab Services
- * Applications Engineering for [Microelectronic Packaging](#)
- * [Refining](#) and Valuable Materials Recovery Support
- * [Precision Parts Cleaning](#)
- * Material Characterization and [Alloy Design](#)
- * Material Soldering and [Brazing](#) Support

Assistance from Materion Experts

Services from our technical experts can range from telephone/email support, customer on-site support, or even assistance at industry events. In addition, our staff regularly supports inventory control, security and financial requests from customers looking to benchmark or apply best practices in dealing with valuable materials. At Materion, a key part of the value we bring is our expertise. We take pride in employing some of the best people in the industry to help our customers.

account" and becomes a credit applied to their next order. This means they do not have the expense of buying a "whole" target each time.

Similarly, for evaporation materials, only about 10% of the precious metal ends up on the customer's product. The rest adheres to the chamber walls. This valuable material is recoverable by cleaning the shields and retaining as much metal as possible - a reclamation service offered by Materion. [Read more...](#)

Thank you for helping with our survey!

We are compiling the data from the Materion customer survey and will keep you informed of our key findings. We appreciate your participation! The input will be used toward improving our customers' service experience.

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