

Optical Innovations News

Volume 1, Issue 3

August 2013

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New Wafer Level Cell to Increase Capacity

Construction Nears Completion

Customers throughout the world are awaiting the September opening of Materion's Wafer Level Cell facility in Westford, MA. With this addition, capacity will be increased across the board and defects in coatings decreased. Ultimately, this will allow our customers to ramp up production lines quicker, introduce new variations of their products, and lower prices for detectors to the general public due to yield increases.



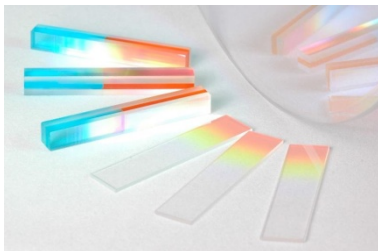
Patterned Low Defect Anti Reflective Coating on Wafer

Coating Chamber Progress

Construction on the 3000 square foot clean room and the installation of the first 200mm coating chamber will be completed at the end of July. Two more coating chambers are set to be installed during the next year and the initial chamber designed to run these coatings will be transferred from its original facility in Tyngsboro to the clean room facility in Westford. We will also be installing a high tech ultrasonic cleaning capability with a slow pull capillary dry system that will assist in achieving our goal of defect-free Infrared (IR) coatings. To ensure that wafers will not be exposed to a non-clean room environment during the work process, our semi-automated inspection tool will also be moved to the cell. Read more about our [expanded wafer level cell capacity...](#)

Bandpass Linear Variable Filters

Materion Introduces Improved Capability



As a leading manufacturer of cutting-edge linear variable filters for over 15 years, Materion has the experience and technology to address the growing need for more complex filters. LVF's have been available in short-pass and long-pass configurations for many years. Recently, there has been an increased demand for true, cut-on/cut-off band pass linear variable filters for a number of

applications. The continuous wavelength monitoring capability of these filters offers improved capability and enhanced performance in areas such as air pollution instruments, monochromators, remote sensing, earth imaging, threat warning systems and more.

IN THE NEWS! Space, Science & Astronomy

**NASA Hands Off Next
Generation Landsat 8
Spacecraft**



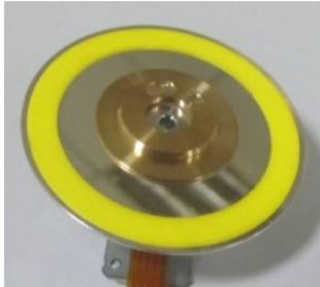
Landsat image showing the eruption of Puluweh volcano in Indonesia. Photo credit: NASA

NASA developed and launched Landsat 8 in February 2013. It has now turned over control to the US Geological Survey. The

Materion has been developing bandpass linear variable filters for a number of years. Recent process improvements allow us to achieve bandwidths of 5-10% full-width-at-half-maximum (FWHM) of < 1.5%. As an example, our current capability allows us to achieve a wavelength range of 400nm to 1000nm with a linear dispersion of 10nm/mm and a deviation from linearity of +/- 5%. We have an active program to continue improving on this capability. Read more about our [bandpass linear variable filters...](#)

Innovative New Phosphor Wheel Will Improve Performance

Technology Targets High Power Laser & Hybrid Projectors



Materion is developing an advanced phosphor wheel that will improve projector emission performance. The innovative product is designed for use in high power laser, hybrid or high power solid state illumination applications. The phosphor wheel will be more efficient in converting laser power to visible light in a high temperature working environment. Our unique technology combines material deposition and coating toward greater effectiveness. The new deposition

material will reduce light loss when converting laser power to visual light and achieve better brightness in high power laser illumination. .

Materion is the world's largest manufacturer of optical components. It is planned that the cutting-edge phosphor wheel will go into mass production early in 2015 and join our array of products that support customers' light management requirements. The phosphor wheel can be used with high laser power (>80w) and survive above temperature of 200 degree C. It can be utilized for a transmission system or a reflective system and comes in a ring shape or segmental shape. Read more about the development of the [new phosphor wheel...](#)

Thin Film Coatings on Flexible Substrates

From Materion Large Area Coatings

Materion Large Area Coatings (MLAC) in Windsor, CT provides key functional components for demanding applications in the medical and display industries. Our high performing, reliable and cost-effective flexible thin film coatings provide effective solutions. For example, each year MLAC helps millions of diabetics manage their disease by providing the electrode materials that ensure blood glucose test strips generate accurate results.



Blood Glucose Test Strip

MLAC Advantage - Significant Cost Savings

To support high-volume flexible thin film applications, MLAC uses large sputtering chambers that can accommodate rolls of material with widths up to 62 inches. During the sputtering process, the flexible substrate (typically polyester or polyimide) continuously moves through the deposition zone, allowing for 10,000+ square feet to be coated per cycle. Customers who are able to transition their application to a roll-to-roll manufacturing process will realize significant cost

satellite begins a ten year observation mission of earth from an orbit 438 miles high - with an orbit completed every 98 minutes. The whole Earth is imaged in 115 mile wide swaths. It takes about 16 days and 224 orbits to cover the full Earth surface. Images are taken using two instruments - OLI and TIRS - that carry Materion filter arrays. View data and [Read more...](#)

Cassini Operating Under Solstice Mission"



Image of Saturn captured by Cassini spacecraft. Photo credit: NASA

The Cassini spacecraft has detected precursors of snow in the upper atmosphere of Titan, Saturn's largest moon. Materion provided the filter arrays for the VIMS instrument which captured the images. Materion provided the filter arrays in 1993 and Cassini was launched towards Saturn in 1997. The Spacecraft landed on Saturn in 2004 and continues to operate successfully today as the re-named "Solstice Mission." For more information visit www.nasa.gov under Cassini mission. [Read more...](#)

savings per unit area. Read more about [LAC thin film coatings...](#)

Parallelogram Filter Array

Materion Introduces New Design



Materion Offers a Broad Range of High Precision Multispectral Patterned Filter Arrays

Materion continues to push its capabilities in the micro-assembly of discrete filters with the successful design and construction of a multi element parallelogram-multi-spectral filter micro-array. A key driver in its development was the desire to reduce mass, power and volume in multi-spectral sensors through the elimination of the filter wheel or many discrete filters. The main advantage of the new parallelogram micro-array technology is the reduction of stray light which will provide customers with higher quality

data and imagery.

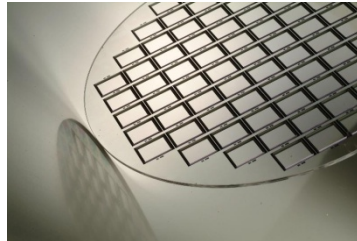
High Performance Alternative

These newly developed parallelogram micro-arrays will provide a very rugged, high-performance alternative to linear variable filters or diffraction gratings. They may be designed and built for use with any focal plane array detector - from ultraviolet to long wave infrared wavelength ranges. More about the [parallelogram filter array...](#)

Low Defect Wafer Level Coatings

Materion Expertise in Design & Deposition

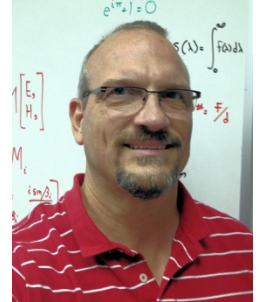
As the industry leader for thin film coatings, we understand the need for state-of-the-art quality and have established extraordinary defect control in our processes. Whether your application is gaming, Infrared (IR) sensing, remote control, projection display, automotive, medical, instruments, or MEMs/LCoS/CCD/CMOS, we can partner with you for smarter solutions.



Cover Glass

A key factor in defining the quality of the end product is the superiority of the device's low defect coatings. Meeting tight restrictions for defects in size and density is critical in devices where cover glass is located very close to the focal plane, such as in silicon-based sensors and LCOS microdisplays. The cover glasses consist of clean surfaces with the addition of functional coatings such as Antireflective (AR), NIR blocking filters, index matched ITO and, in some cases, chrome apertures. Materion offers a broad range of coatings and can design to your specific coating requirements. More about the [low defect coatings...](#)

Meet Materion: Mike Tatarek



Mike Tatarek has over 30 years of experience in the optical thin film industry. He brings his extensive background and expertise to the position of Director of Technology at Materion Precision Optics & Thin Film Coatings in Westford and Tyngsboro, MA.

In that role, Mike's key responsibility involves identifying emerging and enabling technologies that reinforce Materion's technical development and that support the company's aggressive growth plans. Mike also works closely with customers to understand their needs and identify solutions to their problems. Mike works with Operations and the Strategic Business Unit and reports to VP Robert Naranjo.

As to his work at Materion, Mike comments: "I enjoy working in the field of thin film optical interference coatings. Where else could I get to work with math, physics, chemistry, mechanics, material science, electro-magnetism, vacuum

Infrared Filters - Growing Market!

Materion Boosts IR Production Capacity



The market for infrared (IR) filters has sharply increased over recent years and demand is expected to double over the next five. To support this rise, Materion is boosting our production capacity in Westford, Massachusetts. The expanded capability will also address the customer's need for high precision/repeatable spectral performance at low cost.

systems, electron and ion beams, thermodynamics, electronics, and computers - all at the same time?"

[Read more about Mike...](#)

Infrared Filters and Gas Sensing

Infrared gas sensing is based on the given fact that gas molecules absorb IR radiation. Each gas has a unique "fingerprint" which occurs at a specific wavelength in the electromagnetic spectrum. Hydrocarbons have a unique fingerprint at 3.3 microns, while Carbon Dioxide has a unique fingerprint at 4.26 microns. To isolate specific gases for different applications, a narrow band pass filter is used to capture the target gas while blocking out all other wavelengths. Thus, the sensor will not see any other gases. Read more about [infrared filters...](#)

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