MATERION ADVANCED MATERIALS GROUP

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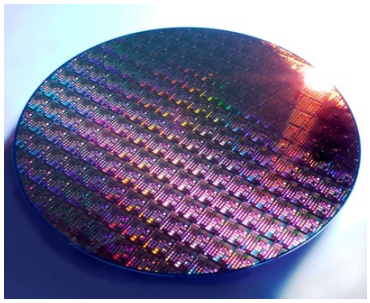
Coating Processes Evolve - Wafer Level Coatings

Today's coating processes provide the capability to produce anti-reflective (AR) coatings, bandpass filters, separation filters, high laser damage threshold coatings, mirror coatings, etc. with high precision and high yields. The production environment is based on batch-coating processes and component sizes that range from mm to meter. Generally, one function such as limited wavelength coverage is provided by the standard coating process.

The desire to incorporate optical coatings at the wafer-level stage was inspired by semiconductor manufacturing practices, and has led to an evolution in specialty optics requirements. Development of processes that would enable complex multi-layer coatings to be incorporated into wafer manufacture called for new thinking. It allowed for the reduction of deposition temperatures and incorporation of photolithographic steps to define smaller coated areas.



An example of the use of wafer-level integration and production is the manufacture of solar cells. The most efficient solar arrays in production are composed of multi-junction thin film PV cells such as: $Cu(In,Ga)Se_2$ (CIGS), $CuInSe_2$ (CIS), CuInSSe (CISS), and the GaAs-based compositions InGaP/InGaAs/Ge triple junction cells developed for space applications. The latter cells power orbiting missions for NASA, NOAA, DoD and for commercial applications in communication, entertainment and GPS satellites. The junction and absorber layers, buffer interlayers, contact electrodes, and AR coatings are all deposited at the wafer stage. Advances now allow for solar cell wafer diameters to be 150 mm. Read More...

Yttrium Fluoride - Improved Performance

When selecting inorganic compound materials, there are critical differentiating factors to consider; among these are cost, purity, packing and particle density, as well as phase and porosity.

A quality finished product is achieved by several combined factors. It requires starting out with high purity source material as well as having excellent reaction and manufacturing processes in place. It is possible to begin with a high purity material, but if the reaction process and/or the manufacturing processes are sub-sufficient, the end product will be less than desirable. A poor manufacturing process will affect melting behavior, particle size distribution and process stability. Here we will trace the significant developments of yttrium fluoride (YF_3), a mature, critical low index material used in infrared (IR) and ultraviolet (UV) thin film engineering. Materion's industry expertise and broad manufacturing capabilities allows us to satisfy a range of yttrium fluoride requirements for a variety of markets.

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Face to Face

Meet Brian Mandiak, Regional Sales Manager for the Advanced Materials Group. Brian handles promotion and sales predominantly of thin layer coating materials and chemicals manufactured out of our Milwaukee facilities that support the Optics, Large Area Glass, Solar and Core Inorganic markets. His responsibilities include growing market share through consistent customer interaction. To enhance this, he focuses on understanding customer requirements and uncovering opportunities to excel in meeting their needs. He is part of the Sales Team that reports to Robert Dixon, Regional Director of Sales.

Brian joined the Materion family in 2012 and brings with him a heavy scientific background. He earned his BS in Clinical Laboratory Science/Medical Technology from SUNY at Buffalo. He has held positions that include work as a Sr. Clinical Laboratory Scientist in such areas as clinical chemistry, hematology, toxicology, blood gases and endocrinology. He is affiliated with The Medical Laboratory Scientist Group as well as The Optics & Photonics Industry Network. Read More...

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