Advanced Energy at SVC TechCon 2019

April 27 - May 2, 2019 | Long Beach, CA | Booth #306

AE provides power and control technologies for high-tech and industrial vacuum coating applications. Visit us at Booth #306 during SVC TechCon to see our latest solutions for your most challenging processes.

We hope you'll join us for a keynote session as well as two technical program presentations.

Keynote Session | Thursday, May 2, 2019 at 8:30 AM

Lowering Production Cost of 'Big MEMS' Chip Technologies Using Large Area Manufacturing Techniques

Presented By: Robert G. Andosca

Since the 1980's microelectromechanical systems (MEMS) based devices have been manufactured primarily on circular silicon (Si) substrates. This has been accomplished by primarily riding the coattails of the semiconductor integrated circuit industry, where Si substrate diameters have grown from less than 50 mm to 300 mm. As new larger diameter fabrication equipment was needed the previous generation tools (refurbished) were adopted by the MEMS industry at much lower price points.

Today, the semi industry has stalled at 300 mm, likewise the MEMS industry is mired at 200 mm diameter in size. The issue is that many MEMS chip dimensions can be large, greater than 10 × 10 mm^2 in area and can have expensive wafer-level packaging utilized to protect moving parts from inexpensive plastic molded packaging. When considering the $1 per mm^2 'rule of thumb' for unyielded chip production cost, these "Big MEMS" chips are very difficult to fabricate cost effectively for their associated product market adoption.

Meanwhile over the last two decades of flat panel display (FPD) technology requirements have continued to increase in complexity and manufacturing capabilities. This includes increasing FPD resolution from today's 4K to 8K and substrate size up to 3.1 × 3.1 m^2, a.k.a. 'Gen 10' glass. To achieve these challenging levels many manufacturing obstacles have had to be overcome, such as magnetron sputtering over large areas, including deposition thickness uniformity and optical property uniformity, the reduction of yield detractors, such as particles generated due to plasma arcing, and other process challenges.

What if the MEMS industry wasn't restricted in substrate size, such as by utilizing Gen 8 (2.1 × 2.4 m^2) or older (smaller area) fabrication equipment? This talk will review a set of Big MEMS chips and how utilizing large area display manufacturing techniques could reduce their accompanying production cost.

Technical Session | Wednesday, May 1, 2019 at 10:00 AM

Anatomy of Arcs and Arc Handling

Presented By: Doug Pelleymounter, Dave McAninch, Robert Andosca

One of the most common topics in magnetron sputtering is arcs, particles and arc management, with a drive to reduce film inclusions, splashes and pinholes, in addition to minimizing damage to targets. This has resulted in an industry wide drive to minimize arc energy and the associated effects. The last 20 years has seen significant evolution in the understanding, detecting and managing of arc events with ever increasing sophistication. This paper describes the anatomy of an arc and where the arc energy occurs, and the evolution of arc management from its rudimentary roots to today's modern technologies. We will examine some of the biggest causes of arc energy and what is being done to minimize the impacts of arcs on film and targets.

Technical Session | Wednesday, May 1, 2019 at 11:40 AM

System Improvements and Discussion to Minimize Lightning Arcs or Crazing

Presented By: Josh Pankratz

The technology exists to advance film properties and improve throughput in large area systems. However, defects caused by system limitations prevent implementation of new process capabilities. Using the electrical models that show the causes of the lightning arc events, system design recommendations have been identified, implemented and proven to be effective. Several system design recommendations are proposed to minimize the unintended current paths in large area systems and the reason they are effective.