Tuesday Lunch, November 14, 2006

Exhibitor Workshop
Room Exhibit Hall - Session EW-TuL

Exhibitor Workshop
Moderator: R.A. Childs, MIT

12:20pm **EW-TuL1 Applications of a New TOF-SIMS Tool for 300 mm Wafer Inspection**, *E. Niehuis, **R. Moellers**, T. Grehl, D. Rading, F. Kollmer,* ION-TOF GmbH, Germany

We have developed a new fully automated and cleanroom compatible TOF-SIMS tool with FOUP loading for 300 mm wafer inspection. The instrument and its automation is designed to apply a variety of recipes for various analytical tasks. We will describe the instrument performance and discuss various applications of this tool in semiconductor industry like trace metal detection, detection of organic contaminants, analysis of gate dielectrics and ultra-shallow implant dosimetry.

12:40pm **EW-TuL2 Advantages of the Delay-Line Dector for XPS Imaging**, ***C. Blomfield**, S. Page,* Kratos Analytical

The delay-line detector, comprising a multi-channel plate stack above a delay-line anode, is used for photoelectron detection in both spectroscopy and imaging mode. With over 100 detector channels the DLD can also be use to acquire unscanned or 'snapshot' small spot spectra in a matter of seconds. Genuine pulse counting in 2D imaging mode means that quantitative parallel images can be generated to allow greater insight into the lateral distribution of chemical species at the surface. The ability to obtain a fast parallel chemical image which can be used as a reference to perform spectroscopic analysis is an integral part of the AXIS XPS instruments. The incorporated electrostatic deflection system allows easy multi-point analysis to be carried out from within the imaged field of view. The real time imaging capability of the Axis intruments reduce sample setup time and significantly reduces the image acquisition time. This ultimately leads to improved data quality and a greater sample throughput.

1:00pm **EW-TuL3 A New End-Hall Ion Source with Improved Performance**, *L. Mahoney, D. Burtner, D. Siegfried, **C. Dale**,* Veeco Instruments Inc.

End-Hall ion sources have been used for almost 20 years in the optical coating industry for ion assisted deposition (IAD) and substrate pre-clean. In these applications, end-Hall ion sources have several desirable performance characteristics. They produce a large current of low energy ions, and they distribute the ions uniformly over a large coverage area. The sources can operate on either argon or oxygen, and maintenance requirements are typically lower than for gridded ion sources. The trends toward higher production volumes and reduced cost of ownership in the optical coatings industry require ion sources with higher output, modular integration, and more effective maintenance features. This paper presents a new end-Hall ion source that has improvements in performance, form factor, and required maintenance over the current industry-leading end-Hall ion source. Ion production rates, beam uniformity, and thermal characteristics are presented at discharge powers up to 3 kW.

1:20pm **EW-TuL4 Next Generation Commercial LEEM FE-LEEM P90**, *B. Achilles, **A. Berghaus**,* SPECS GmbH, Germany

A next generation Low Energy Electron Microscope (FE-LEEM P90) with unsurpassed 5 nm resolution for dynamic LEEM experiments is available from SPECS GmbH, Berlin. With this instrument, based on the design of Dr. Rudolf Tromp, nanometer scale processes on surfaces can be made visible in real-time. At this year's AVS Fall Meeting an innovative energy filter for PEEM imaging will be presented, which enables imaging with an energy resolution down to 250meV with a minimal impact on the high spatial resolution of the instrument. Low Energy Electron Microscopy, invented by E. Bauer, is a key technique for research in the field of surface dynamical processes, growth and structure. In a LEEM electrons are slowed down to energies of not more than several ten eV before they interact with the sample. Therefore the information only comes from the very surface of the sample. This allows in situ observation and analysis of surface processes. Guiding the design of the SPECS FE-LEEM P90 was the goal to achieve the highest resolution with a minimum number of electron-optical elements. Incoming and outgoing electrons are separated by a 90° magnetic prism array. This geometry allows a simple, intuitive step by step adjustment of all lens parameters. The magnetic prism transfers both the LEEM image and the LEED pattern astigmatically, allowing routine switching between real image and diffraction pattern. Both image and LEED pattern are transferred without the negative effects of chromatic dispersion, offering superior image and diffraction capabilities. The SPECS FE-LEEM P90 is integrated into a UHV LEEM sample analysis chamber with facilities for sample preparation and in-situ high temperature sample processing.

1:40pm **EW-TuL5 BOCCT Magnet Retrofit Assemblies**, *M. Bernick, **J. Hrebik**,* Angstrom Sciences, Inc.

Angstrom Sciences, Inc. has optimized a high-performance magnet retrofit assembly for BOCCT-HRC magnetron assemblies to improve target utilization over existing designs. As a magnetron sputtering cathode ages and the machine's efficiency declines, a decision to either replace or repair the equipment becomes necessary. However, cost effectiveness in production is vital to maintaining a competitive edge in the marketplace. Angstrom Sciences' BOCCT-HRC retrofit offers a solution, dramatically improving target utilization over the existing design without changing process parameters and ultimately maximizing ROI.

2:00pm **EW-TuL6 K-Alpha, A New Approach to X-ray Photoelectron Spectroscopy (XPS)**, ***R.G. White**,* Thermo Electron Corporation, UK

X-ray Photoelectron Spectroscopy (XPS) is a powerful surface analysis technique. It provides quantitative information about the elemental and chemical state composition of the first few monolayers of a material. When combined with ion beam sputtering, compositional depth profiles can be obtained from a few micrometers. The method has applications in many fields, including polymers, biomaterials, glasses, metals catalysts, and semiconductors. Until now, the instrumentation has been expensive to acquire and has needed an expert to determine the most appropriate analytical conditions. These two factors make the cost of ownership very high. Many scientists, who would benefit from this type of analysis, are deterred from using the technique. In this symposium, it will be shown that, by the use of modern manufacturing techniques, novel technology and advanced software design, XPS has become available to all analysts. High sensitivity combined with extensive automation maximises throughput. Automation in data processing and reporting allows the analyst to obtain maximum use of the instrument, avoiding the need for repetitive and time-consuming activities. XPS has become be a multi-user analytical method.

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