Applied Materials Unveils New Defect-Review SEM for Advanced Chip Production

June 16, 1999
   Business Editors/High-Tech Writers

   SANTA CLARA, Calif.--(BUSINESS WIRE)--June 16, 1999--

   High Productivity SEMVision cX Classifies Wafer Defects In-Line
   to Isolate Their Source and Enable Rapid Control
   of Process Excursions

   Applied Materials, Inc. (Nasdaq/NMS:AMAT) announces the SEMVision(tm) cX, the latest member of the company's SEMVision product series, for the automatic review and classification of wafer defects in advanced semiconductor production lines. The cX builds on the company's breakthrough SEMVision system, which continues to be at the forefront of defect review technology.

Using OperatorFree(tm) EDX (energy dispersive x-ray) analysis, the SEMVision cX features automatic material identification that characterizes defects on unpatterned wafers and provides chipmakers with information on the defect's source. The system also offers high-productivity operation at 500 defects per hour and color MPSI (Multiple Perspective SEM Imaging) for enhanced topography and material information. These features work together to provide chipmakers with fast, reliable defect information on both patterned and unpatterned wafers, alerting them of process excursions and helping identify the defect's source to enable faster time to correction.

"The SEMVision cX's ability to automatically identify and classify a large range of defects can change the way fabs make decisions about process operations since the information stream can be tied directly to the process equipment," said Dr. Gino Addiego, president of Applied Materials' Process Diagnostics and Control Product Business Group. "A fab can be highly productive without a large investment in operator training, because the SEMVision cX identifies, classifies and performs a defect material analysis automatically, at high throughput appropriate to in-line use in the fab."

EDX technology uses x-ray spectroscopy to identify the precise material composition of many defect types so that users can determine their source. The SEMVision cX is the first SEM review system to feature OperatorFree EDX analysis that increases processing speed of the system and requires less engineering expertise. For the first time, material information is combined with automated defect classification (ADC) to provide fab engineers with all vital defect data. The automated EDX is used to analyze unpatterned wafers, such as monitor wafers and those with blanket films or planarized surfaces. Since fabs use a large number of monitor wafers to check process conditions, the SEMVision cX offers chipmakers an easier, more rapid and reliable review capability.

Although previous defect detection and review technologies could determine bulk defect density on a wafer, the SEMVision cX lets chipmakers go directly to a higher order of information, called "classified defect density," which automatically classifies defects by type (particle, scratch, buried layer, etc.), material properties, and other characteristics that can be specified by the operator. This unique capability lets chipmakers find the cause of defects in the process flow much more rapidly and creates a useful database of information for future reference.

"The SEMVision cX makes automatic in-line defect review and classification a fab-ready defect reduction technology that chipmakers can easily use with a minimum of operator involvement and expertise, but with major benefits to process control," said Dr. Mark Wagner, general manager of Applied Materials' SEMVision product line.

The original SEMVision system, launched in 1998, is already in use or has been ordered by leading chipmakers in the U.S., Europe, Korea, Taiwan and Japan. The SEMVision cX will begin shipping in the third calendar quarter of 1999. Most of the features of the SEMVision cX system can be cost-effectively retrofitted to earlier SEMVision systems, upgrading their capability to that of the latest model.

According to Dataquest, the market for Auto Review and Classification systems, which includes optical and SEM-based systems, totaled $157 million in 1998, and is expected to grow to $405 million by the year 2003.

"Having the SEMVision cX technology in our Equipment and Process Integration Center (EPIC) is already giving us a preliminary database of defect categories for several of Applied Materials' key process technologies, which could be extremely valuable to customers in managing rapid system startup and fast fab ramping," said Dr. Addiego. "We expect to use the SEMVision system extensively as part of Applied Materials' future process development strategy because it offers us the same advantages in yield learning and cycle time as it does for our customers in their fabs."

Applied Materials, Inc. is a Fortune 500 global growth company and the world's largest supplier of wafer fabrication systems and services to the global semiconductor industry. Applied Materials is traded on the Nasdaq National Market System under the symbol "AMAT." Applied Materials' web site is www.appliedmaterials.com.

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