Applied Materials Opens Milestone EPIC Facility for Process Integration

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SANTA CLARA, Calif.--(BUSINESS WIRE)--Nov. 3, 1998--

Fast-Cycle, Process Flow Development Facility Moves
Company Beyond Offering Equipment and Processes to
Providing Integrated Process Modules for Customers'
Next-Generation Device Structures

Applied Materials, Inc. announced today the opening of its new Equipment and Process Integration Center (EPIC) in Santa Clara, Calif., the first facility of its kind in the history of the semiconductor equipment industry. The center currently houses all of the equipment and processes needed for customers to develop and test a completely integrated multi-level metal copper interconnect process before installing it in their fab.

"EPIC provides our customers with a fast, low-risk, economic way to integrate the new technology and materials specified in their most advanced chip designs," said John Egermeier, director of the Process Sequence Integration Division at Applied Materials. "Since process integration typically takes customers months of engineering work after equipment is selected and installed, the capability to do pre-fab integration and testing of a completely integrated process module at Applied Materials can dramatically reduce customers' fab start-up time and shorten time to market for their new products. We are currently demonstrating our newest integrated process module, the Copper Interconnect ESS, and expect to expand this product line very quickly based on our customers' technology requirements."

An integrated process module is a complete set of systems that have been synchronized to work together to enable an optimized process flow. EPIC currently contains all of Applied Materials' copper-based technologies that have been integrated to demonstrate a multi-level metal copper interconnect process flow. Nearby buildings house a state-of-the-art deep-UV photolithography cell for wafer patterning and a full complement of analytical and testing equipment for electrical performance verification.

G. Dan Hutcheson, president of VLSI Research, a leading market research firm, said, "Applied Materials has led the chip equipment industry's process integration efforts for more than a decade, first by successfully commercializing the cluster tool concept for multi-layer dielectric and metal stacks and then combining systems into integrated application modules for shallow trench isolation and ultra-shallow junctions. The EPIC facility represents a major step forward in vision and capability by providing chipmakers with a dedicated center for merging their process integration and qualification tasks before any equipment is put into the fab. If off-site integration can cut capital costs by allowing the equipment to be installed nearer the start of production, it could have a significant positive impact on IC makers' competitive position and profitability in the critical early stages of device production."

To enhance overall equipment effectiveness and facility efficiency, EPIC will incorporate Workstream DFS and Fab300 manufacturing execution systems (MES) software from Consilium. SMIF pods are used to transport wafers during processing to maintain a Class 1 ultraclean environment. EPIC is currently set up for 200mm wafer structures, but will easily expand to 300mm capability as the need emerges.

The Equipment and Process Integration Center's dedicated team ensures rapid turnaround on demonstration runs so customers can quickly evaluate all or part of their copper process flow and receive critical electrical performance data. Process testing is performed using a variety of technologies, including FTIR, Auger, SIMS, SPV, and other standard tests. Device electrical performance is measured using a state-of-the-art Hewlett-Packard 4071 DC test unit with wafer reliability software option and an Electroglas 4090 prober with the high temperature option, replicating the testing capability found in a typical fab. Applied Materials is also collaborating with TestChip Technologies, Inc. and Sandia Technologies to offer test wafers that contain critical device structures and geometries, enabling customers to reduce time by developing a process flow in parallel with designing their circuits.

As part of its strong commitment to environmental responsibility, Applied Materials has designed and started up a complete, closed-loop waste abatement system that removes all traces of copper from the EPIC facility's effluent stream. Using new filtration techniques, the process transforms all copper-bearing aqueous solutions, primarily from CMP and wet cleaning technologies, into de-ionized (DI) water, returning it for facility reuse. Copper solutions from the company's electroplating deposition technology are also treated in ion exchange modules. The only waste products that leave the system are highly concentrated, small-volume solids that are sent to appropriate disposal facilities.

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 http://www.AppliedMaterials.com.