



## Applied Materials Celebrates 20-Year Success of Endura System with New Innovations for Cutting-Edge Chip Designs

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- Industry gold standard for metallization; helped to create nearly every chip
- Breakthrough Endura<sup>(R)</sup> Avenir<sup>(TM)</sup> system enables major transition to metal gate transistors
- New Endura iLB system delivers critical atomic layer barrier films for 22nm node

SANTA CLARA, Calif., Jul 12, 2010 (BUSINESS WIRE) --

Applied Materials, Inc. today celebrates the 20<sup>th</sup> year of its [Applied Endura<sup>\(R\)</sup>](#) platform, the most successful metallization system in the history of the semiconductor industry. Endura systems revolutionized semiconductor metallization by delivering breakthrough technologies and levels of reliability, serviceability and flexibility that far surpassed existing capabilities. The vast majority of microchips made in the last 20 years have been created using one of the over 4,500 Endura systems that have shipped across the globe to over 100 customers.

"When the Endura system was first released, it set a new bar for technical performance and reliability in PVD," said Dr. Mark Liu, senior vice president of Operations at Taiwan Semiconductor Manufacturing Company Ltd. "We rely on Endura systems and its continuous innovations in all our factories to perform a wide range of integrated PVD and CVD applications."

Yasuo Naruke, vice president of Memory Division, Toshiba Semiconductor Company, commented, "Almost 20 years after we purchased our first Endura system, the platform continues to meet our high standards for metallization."

The Endura system continues to set new benchmarks for the industry with the introduction today of two innovative technologies aimed at creating the leading-edge chips needed for the next generation of smart devices. The [Applied Endura Avenir<sup>\(TM\)</sup>](#) system enables chipmakers to incorporate the latest metal gate transistor technology, one of the biggest changes in transistor design since the 1970s, in their most advanced high-performance logic devices. The new [Applied Endura iLB<sup>\(TM\)</sup>](#) system advances the state-of-the-art in atomic layer deposition (ALD) to enable customers to shrink the speed-critical contact structures of 22nm and beyond logic and memory chips.

"The innovations introduced today will keep our customers at the cutting edge, enabling them to drive Moore's Law forward," said Mike Splinter, chairman and chief executive officer of Applied Materials. "Applied's continued investments in technology extensions and productivity upgrades have kept the Endura at the forefront of semiconductor fabrication through many chip generations. Over 85% of the Endura systems shipped to customers in the past 20 years are still in operation today - a testament to the engineers at Applied whose innovation and dedication produced a system that is such an essential part of the semiconductor industry's past, present and future."

### Endura Innovation for Today and the Future

The new [Applied Endura Avenir RF PVD<sup>1</sup>](#) system sequentially deposits the multiple metallic layers that form the heart of a metal gate transistor. Using proprietary radio frequency-enhanced PVD technology, the Avenir system can deposit sub-nanometer films with precisely-engineered interfaces to minimize leakage current and maximize switching speed. In addition to RF PVD, the system's flexible, high-productivity platform can be configured with a wide range of PVD, CVD<sup>2</sup> and ALD technologies, making it uniquely capable of fabricating all metal gate film stack structures in a single pass. The Endura Avenir system has already achieved tool-of-record status at leading logic and foundry customers for 22nm pilot production.

Minimizing the resistance of the interconnections between transistors or memory cells is essential to the fabrication of reliable, high-speed microprocessors and memory chips. A key challenge below 32nm is finding a cost-effective way to deposit a very thin barrier film layer to enable subsequent tungsten fill. The [Applied Endura iLB PVD/ALD](#) system meets this challenge using proprietary radical-enhanced ALD (RE-ALD<sup>(TM)</sup>) technology to deposit ultra-thin, robust TiN<sup>3</sup> films with remarkable uniformity even in very deep trenches with aspect ratios above 20:1. The system is currently the tool-of-record at major logic manufacturers and is being used for advanced DRAM development.

To learn more about the Endura system's 20 years of breakthrough technologies supporting more than 100 different process applications, visit Applied's online home at SEMICON West 2010 at <http://www.semiwestapplied.com>.

Applied Materials, Inc. (Nasdaq:AMAT) is the global leader in Nanomanufacturing Technology(TM) solutions with a broad portfolio of innovative equipment, service and software products for the fabrication of semiconductor chips, flat panel displays, solar photovoltaic cells, flexible electronics and energy efficient glass. At Applied Materials, we apply Nanomanufacturing Technology to improve the way people live. Learn more at [www.appliedmaterials.com](http://www.appliedmaterials.com).

1. RFPVD: radio frequency physical vapor deposition

2. CVD: chemical vapor deposition

3. *TiN: titanium nitride*

Photos/Multimedia Gallery Available: <http://www.businesswire.com/cgi-bin/mmg.cgi?eid=6355399&lang=en>

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