



## Applied Materials' New DPN System Clears the Path to 65nm Transistor Gates

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Production-Worthy DPN Centura System Delivers  
Effective Oxide Thickness Scaling Below 11 Angstroms

Applied Materials, Inc. (Nasdaq: AMAT) extends transistor gate stack technology to the 65nm design node with its 300mm DPN Centura(R) system. The DPN\* system delivers a robust integrated plasma nitridation and anneal process sequence that, for logic devices, allows equivalent oxide thickness (EOT) scaling to less than 11 angstroms and reduces gate leakage by 10x over thermal nitridation techniques. The system also provides superior boron blocking capability, a critical advantage for advanced transistor formation in both logic and DRAM devices.

"The DPN Centura system is the first in our new line of Integrated Gate Stack solutions that combines the company's new 300mm DPN chamber with its industry-leading Radiance RTP\* chamber to provide customers with a production-ready solution for manufacturing the next several generations of transistors," said Dr. Randhir Thakur, vice president and general manager of Applied Materials' Front End Products group. "The DPN system's integrated processing capability provides the critical interface control required for achieving superior device performance. By controlling the ambient throughout the process sequence, the DPN Centura avoids unwanted oxidation, moisture and other contaminants that can degrade device performance."

The nitridation of gate oxides is a critical process step that ensures the continued scaling of advanced devices. Since Applied Materials' DPN chamber uses a plasma, rather than thermal, process to introduce nitrogen to the gate oxide, a higher concentration of nitrogen at low temperature can be incorporated on the surface of the gate oxide, avoiding damage to the channel interface. The optimized DPN process regime and its integration with the Radiance RTP chamber provides industry-leading equivalent oxide thickness scaling and improved channel mobility.

Applied Materials' 300mm DPN Centura system also features the industry-leading Radiance RTP chamber for post-nitridation anneal. Customers with Radiance RTP systems can retrofit their systems with the DPN chamber technology, for cost-effective extension to 90nm and 65nm device development and production.

Applied Materials' single-wafer 300mm DPN Centura system is exceptionally reliable, demonstrating greater than 90 percent uptime at customer sites in high volume production. The system has already been installed at multiple customers in the U.S., Asia and Europe where it is being used for both production as well as advanced development.

Applied Materials (Nasdaq: AMAT), the largest supplier of products and services to the global semiconductor industry, is one of the world's leading information infrastructure providers. Applied Materials enables Information for Everyone(TM) by helping semiconductor manufacturers produce more powerful, portable and affordable chips. Applied Materials' web site is [www.appliedmaterials.com](http://www.appliedmaterials.com).

\* DPN -- Decoupled Plasma Nitridation

\* RTP -- Rapid Thermal Processing

A photo is available at URL:

<http://www.businesswire.com/cgi-bin/photo.cgi?pw.071403/bb4>

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