



## Applied Materials Introduces Nitride550 CVD Process to Enable Next-Generation Transistor Structures

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Single-wafer CVD Process Slashes Production Time and Thermal Budget for Nitride Layers in Logic, Memory Devices

Applied Materials, Inc., the world's leading supplier of CVD (chemical vapor deposition) equipment to the semiconductor industry, announces Nitride550(tm), a high-productivity, single-wafer, silicon nitride CVD process. The Nitride550 process provides IC manufacturers with a simpler, lower temperature solution for etch stop and other gate dielectric films that are currently deposited by batch furnace technologies. The new process has been qualified for advanced logic and memory devices at customer fabs in the U.S., Europe and Korea.

"This Nitride550 process breakthrough is technically superior to conventional batch furnace processing and represents a new market for Applied Materials' CVD technology. Customers around the world are extremely interested in this new process because it helps them to overcome the thermal limitations presented by next-generation devices," said Kevin Fairbairn, general manager of Applied Materials' PECVD product division.

Nitride films are increasingly used throughout the semiconductor device fabrication process, as well as in the final passivation layer. Thin layers of nitride are especially useful as "etch stop" materials. The nitride provides a distinct boundary between two otherwise similar gate materials so etching can be stopped at a precise depth. Nitride's barrier properties are also valuable in applications where chipmakers want to avoid diffusion of dopants or metallic elements into adjacent areas of the transistor structure. According to Dataquest, the market for CVD nitride equipment totaled approximately \$600 million in 1997, and is expected to grow to \$1.3 billion by 2001.

Transistor-level nitride film layers have traditionally been deposited in batch furnace-type reactors that maintain wafers at high temperatures of more than 800 degrees C for an hour. By contrast, the Nitride550 deposits the same layer at 550 degrees C in just one minute, thus reducing production time, virtually eliminating unwanted dopant diffusion and decreasing unwanted silicidation reactions.

The Nitride550 process uses Applied Materials' production-proven DxZ(tm) chamber on the company's industry-leading Centura(R) multi-chamber platform. The Nitride550 process is retrofittable to existing DxZ chambers with the addition of a high-temperature ceramic heater.

In addition to the productivity and thermal advantages of the Nitride550 process, single-wafer processing avoids backside deposition on the wafer. This eliminates the need for additional backside film removal steps associated with LPCVD batch reactors and simplifies the production sequence. The absence of backside deposition also minimizes wafer warpage.

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>.