

Applied Materials Announces Breakthrough in Interface Engineering Technology for 65-45nm Transistors

Applied Materials, Inc. today announced a key advancement in nano-scale interface engineering with its new Applied Siconi Preclean process for fabricating leading-edge transistor contacts.

The Siconi Preclean replaces conventional plasma-based sputter etch technology with a dry, chemical process that gently but effectively removes oxidized silicon under high vacuum. This one-step process prepares the wafer's surface prior to the formation of the critical nickel (Ni) silicide layer to create an interface with minimal damage. The Siconi Preclean also dramatically reduces interface defects while eliminating wet clean queue time restrictions.

"The smallest transistor structures are now only a few atoms or molecules in size, making atomic-level thin film interface engineering extremely critical to the chip's function," said Dr. Farhad Moghadam, senior vice president and general manager of Applied Materials' Thin Films Group. "Combined with our Applied Endura ALPS Ni PVD system, this new Siconi Preclean process enables advanced logic customers to more easily transition to nickel silicide technology to achieve higher switching speeds with lower current leakage -- thus helping to reduce power usage in their advanced chip designs. We are working to extend the breakthrough advantages of our Siconi Preclean technology to other process applications."

The Applied Siconi Preclean process, which is completed in a single chamber for optimal throughput and system utilization, is highly selective to oxide, enabling oxide removal with minimal impact to other materials or small features on the device. The Siconi Preclean technology can also be used after silicidation to remove the oxidized silicide, forming a low resistance interface with the contact structure.

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