



## Applied Materials Speeds Chip Interconnects with High-Performance, Power-Efficient, Low-k Technology

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- **Mobility era demands lower power, faster microprocessor and graphics chips**
- **Nearly one-third of microprocessor power is consumed by the interconnects**
- **Challenge: Providing a low resistance, mechanically strong, dielectric film for high chip yield**
- **Solution: Applied's third-generation ultra-low-k film and UV curing technologies**

SANTA CLARA, Calif., July 12, 2011 - Applied Materials, Inc. today introduced its latest technology for building fast, low power interconnects in logic devices at the 22nm node and below with the [Applied Producer® Black Diamond™ 3](#) deposition system and [Applied Producer® Nanocure™ 3](#) UV curing system. Together, these systems create the critical low-k [dielectric](#) films that insulate miles of copper wiring that connect a chip's transistors to each other and to the outside world enabling higher speed, more power-efficient smartphones, tablets and PCs.

"Our new Black Diamond 3 technology is extendible to the 14nm design node and below and will enable the fabrication of the next several generations of smaller, higher performance and more power-efficient devices," said Bill McClintock, vice president and general manager of Applied's Dielectric Systems and Modules business unit. "Our customers are very excited about this new low-k solution since it can be smoothly integrated into their existing process flows and has the superior mechanical strength needed to withstand the rigorous packaging process to enable higher device [yields](#)."

Designed at the molecular level with a proprietary chemistry, Applied's Black Diamond 3 process creates a dielectric film with uniform porosity. This engineered nano-porosity greatly increases the mechanical strength and hardness of the film - enabling it to withstand the stress of hundreds of downstream processes and [packaging](#) steps. The new film also delivers an industry-leading [k-value](#) of 2.2, which reduces unwanted, or parasitic, capacitance in interconnects and allows chipmakers to boost the electrical performance of their devices. A lower k-value also helps to reduce switching power losses for optimizing battery life and reducing heat build-up, which are critical for power-efficient mobile devices.

The new Applied Producer Nanocure 3 system enhances Applied's industry-leading ultraviolet (UV) curing technology for porous low-k films with advancements in UV source optics and chamber design that provide up to 50% more uniform curing than conventional processes. The Nanocure 3 employs a high intensity UV source with a low pressure curing process that results in 40% faster curing. Combined with the Black Diamond 3 film, this two-step deposition and cure process provides up to twice the mechanical strength of Applied's successful second generation Black Diamond film, reducing device variability and boosting chip yield.

"Applied's Black Diamond technology was introduced for the 90nm technology node and has remained the industry standard for low-k films for more than a decade due to our continuous innovation in significantly improving dielectric film strength while simultaneously reducing its k-value," said Dr. Randhir Thakur, executive vice president and general manager of the Silicon Systems Group at Applied Materials. "We are pleased that our [interconnect solutions](#) are helping the industry keep pace with the relentless drive for greater power efficiency and speed."

Applied Materials will showcase the breakthrough Black Diamond 3 and Nanocure 3 technologies at Semicon West in San Francisco from July 12-14. For more information, visit [www.appliedmaterials.com/events/semicon-west-2011](http://www.appliedmaterials.com/events/semicon-west-2011).

Applied Materials, Inc. (Nasdaq:AMAT) is the global leader in providing innovative equipment, services and software to enable the manufacture of advanced semiconductor, flat panel display and solar photovoltaic products. Our technologies help make innovations like smartphones, flat screen TVs and solar panels more affordable and accessible to consumers and businesses around the world. At Applied Materials, we turn today's innovations into the industries of tomorrow. Learn more at [www.appliedmaterials.com](http://www.appliedmaterials.com).

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[Applied's third-generation ultra-low-k film and UV curing technologies](#)

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