

Applied Materials and IMEC Collaborate to Develop 45nm Transistor Technologies

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Applied Materials, Inc. and IMEC, Europe's leading independent [nanoelectronics](#) and [nanotechnology](#) research center, are working together to develop 45nm-generation transistor-level semiconductor processing technologies. Since this collaboration is targeted for critical ultra-shallow junction, gate stack and strain engineering programs, Applied Materials will provide IMEC with the industry's most advanced transistor fabrication technologies, the Applied Quantum X Implant, the Applied Vantage Radiance Plus RTP, the Applied Centura Gate Stack and the Applied Producer CVD systems.

Dr. Luc Van den hove, vice president, Silicon Process and Device Technology of IMEC, said, "We have enjoyed a close relationship with Applied Materials for many years and we continue to be impressed by the high level of technological expertise Applied brings to our joint development programs. We expect this cooperative arrangement to help accelerate our 45nm programs and push the boundaries of front-end process technology rapidly beyond 45nm to even smaller device nodes."

For ultra-shallow junction development, IMEC purchased Applied Materials' single-wafer high current Quantum X implant system with high-tilt capabilities for 45nm and beyond precision and a Vantage Radiance Plus RTP system for annealing. To develop advanced gate structures, IMEC selected Applied's Gate Stack system, with chambers for oxide growth, decoupled plasma nitridation, RTP post-nitridation anneal and polysilicon deposition. IMEC's Applied Producer CVD systems include HARP(TM) and ultra-high stress nitride film processes

that enable enhanced performance through strain engineering and Applied's Advanced Patterning Film(TM) process for optimized 45nm lithography.

"Applied Materials strongly supports IMEC's efforts and capabilities to advance the state of semiconductor technology," noted Dr. Randhir Thakur, vice president and general manager of Applied Materials' Front End Products group. "Applied is focused on providing manufacturing systems to enable transistor scaling to 45nm and beyond, so it's a natural fit for us to collaborate with IMEC on its leading-edge transistor development. We are working together on a number of key initiatives, including advanced gate stack technologies, ultra-shallow junction and strain engineering, and look forward to further strengthening our relationship as we collaborate on these important 45nm transistor programs."

Applied's work with IMEC is part of IMEC's nanoelectronics research platform which has many leading semiconductor manufacturers as core members, including the top three European chipmakers, Infineon, STMicroelectronics, and Philips Semiconductor, as well as Intel, Samsung, Matsushita, Texas Instruments and others.

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