



**A** company wants to supply coated glass to flat-panel display manufacturers. The glass must be coated with a very thin, uniform layer of indium tin oxide (ITO). With conventional sputtering processes, controlling the material deposition on the glass is difficult, and a too-thick, nonuniform layer of ITO could compromise the performance of the display. Here is a product that could enable more process control in these sputtering systems.

IonCell™

**How It Helps:** IonCell cesium cartridges allow better control over the thin film deposition process, resulting in higher quality thin films. These cartridges can be implemented as a modification to existing proprietary sputtering systems, eliminating the need to purchase new equipment because the modified \$1 million unit can perform like a \$10 million unit. The cartridges are easy to install, similar to an ink cartridge for a printer, and last approximately 200 hours of sputtering time. No special handling or hardware is required.



**How It Works:** IonCell cesium cartridges supercharge vacuum deposition processes, allowing manufacturers to generate ITO coatings with enhanced and controlled properties. The cartridges are designed to be inserted into an injector assembly, which can be attached to any proprietary sputtering system. This injector transforms a conventional sputtering system into an ionized physical vapor deposition source. In the assembly, a heater heats the cesium cartridge, causing it to expel neutral cesium particles. The introduction of cesium into the process causes ionization of the sputtered material. The negative ions produced by the bombardment of the target are repelled by the target material and are directed toward a substrate. The substrate can be grounded or can be positively biased to attract the sputtered ions, providing a higher level of control over the formation of a very thin, smooth, and uniform layer of material.

**How Much It Will Cost:** The purchase price of the IonCell cesium cartridges is about \$200 each.

**When It Will Be Ready:** The cesium cartridges are available now. Hanwha L&C Corporation, a South Korean company involved in plastics, chemicals, automotive parts, and other materials, recently purchased a proprietary sputtering system that incorporates an IonCell cesium-based injector subsystem. The company will use this technology to produce thin-film ITO coatings on glass for organic light-emitting displays.

**Who Is Working On It:** The original developer of the cesium technology was SKION Corporation, which merged with Plasmion Corporation in 2001. Plasmion develops leading-edge thin-film application technology for the display, semiconductor, storage disc, and optical communications industries. The company employs 20 people (9 with doctoral degrees) and occupies a 20,000-square-foot facility that includes state-of-the-art vacuum coating and testing systems and analytical instruments. Additional funding has been provided by The Egg Factory, LLC, a venture capital group. For more information, contact Steven Kim of Plasmion at (201) 963-5450 or skim@plasmion.com. The company Web site is [www.plasmion.com](http://www.plasmion.com).






**MDA Origins**

Dr. Steven Kim, founder of SKION and Plasmion, developed the fundamental principles of this technology for use in a neutral particle beam weapon with the support of SDIO and BMDO in the late 1980s and early 1990s. In 1996 and 1997 under BMDO SBIR Phase I and II contracts, SKION investigated the use of super-high brightness electron-emission film for field emission displays in ballistic missile defense systems.

