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## News Release

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### **Merck KGaA, Darmstadt, Germany, presents next-generation lithography and patterning solutions at SPIE 2015**

- **After the acquisition of AZ Electronic Materials, Merck KGaA, Darmstadt, Germany, joins SPIE 2015 to present highlights of innovative technologies for future lithography and patterning in San Jose, CA, on February 22 – 26, 2015.**
- **Merck KGaA, Darmstadt, Germany, invites SPIE visitors to learn about the latest developments in DSA, spin-on metal oxide hardmasks (MHM), and chemical shrink materials at the eight presentation sessions.**

Darmstadt, Germany, February 18, 2015 – Merck KGaA, Darmstadt, Germany, a leading company for innovative and top-quality high-tech products in healthcare, life science and performance materials, joins SPIE Advanced Lithography 2015, as a result of the acquisition of AZ Electronic Materials, a key lithography and patterning materials supplier and the participant of SPIE for over 30 years. Merck KGaA, Darmstadt, Germany, will present at SPIE 2015 the latest developments in patterning technologies on directed self-assembly (DSA), spin-on metal oxide hardmasks (MHM), and chemical shrink materials for the advanced technology nodes. These innovative imaging materials enable the development of the most advanced integrated circuits and microelectronics technologies, many of which are found in next generation consumer electronic devices, such as smartphones or tablet computers.

#### **Merck KGaA, Darmstadt, Germany, and AZ Electronic Materials join forces to strengthen market leadership**

Merck KGaA, Darmstadt, Germany, acquired AZ Electronic Materials in May 2014, extending its Performance Materials leadership position from liquid crystals and organic materials to high-tech materials for the semiconductor industry.

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#### Merck KGaA

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Rico Wiedenbruch, Head of Integrated Circuit Materials Business Unit of Merck KGaA, Darmstadt, Germany, explains the benefits of the acquisition, “With both companies joining forces, two leaders in the global electronics materials industry are now sharing know-how and resources. This is great news for our customers as they will benefit from substantially strengthened R&D capabilities, a broader product and solution portfolio, and of course a significantly increased network of experts collaborating to deliver state-of-the-art technologies”.

### **New patterning solutions for the challenging shrinkage needs**

Merck KGaA, Darmstadt, Germany, champions in many innovative patterning technologies for semiconductor industry as key solutions to meet future technology nodes.

“Our state of the art technology offers solutions to the challenges of shrinkage trends for future nodes, which includes pitch scaling in lithography and 3D structures in devices. In terms of lithography materials, Merck KGaA, Darmstadt, Germany, has leading DSA technology which enables patterning for 7nm logic and 1xnm DRAM device technology nodes and beyond. Our chemical shrink material enables finer imaging with good pattern quality and wider process margin. We also provide metal hardmask materials (MHM) that offer value by simplifying the manufacturing process of advanced device structures”, states Shinji Tarutani, Head of R&D Lithography for Integrated Circuit Materials at Merck KGaA, Darmstadt, Germany.

At SPIE 2015, the company will unveil new process flows and materials for advanced patterning in extreme ultra-violet (EUV) lithography and directed self-assembly (DSA), which help enable future imaging requirements. Partnering with leading material research centers, Integrated Circuit (IC) equipment and device manufacturing companies, and a major industry consortium, Merck KGaA, Darmstadt, Germany, is the leading material and process know how provider for DSA, a novel technology that offers a very significant reduction in cost-of-ownership compared with existing patterning techniques.



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Extreme Ultraviolet (EUV) is another emerging and developing lithography approach for improvement in imaging capabilities. The company's EUV resist roughness controller (ERC) is an innovative concept that can improve resist Line Edge Roughness (LER) by about 15%. This material also works with ArF resists.

The novel spin-on metal oxide hardmasks (MHM) that will be presented by Merck KGaA, Darmstadt, Germany, are highly etch resistant and easily removed to simplify next-generation pattern transfer applications, resulting in more efficient and cost-effective process flows compared to traditional methods. This innovative platform can be used as a sacrificial filling material, for reflectivity control, or as a permanent layer, depending on the device and integration requirements.

Merck KGaA, Darmstadt, Germany, is the market leader for chemical shrink solutions. This key enabling technology can extend 193 nm lithography to substantially lower feature sizes without investing in new scanner technology.

SPIE Advanced Lithography 2015, the premier conference for the global lithography community, will be held in San Jose, California, United States, February 22 – 26, 2015. The experts from Merck KGaA, Darmstadt, Germany, will explain the major advances in patterning materials with various presentations throughout the 5 days conference. Special topics on the latest DSA advancements will be reported in a total of eight presentations during the upcoming SPIE proceedings, such as DSA defectivity, LER/LWR, templated DSA, chemoepitaxy DSA, high chi DSA, novel block-co-polymers and DSA integration.

All Merck KGaA, Darmstadt, Germany, press releases are distributed by e-mail at the same time they become available on the EMD Group Website. In case you are a resident of the USA or Canada please go to [www.emdgroup.com/subscribe](http://www.emdgroup.com/subscribe) to register again for your online subscription of this service as our newly introduced geo-targeting requires new links in the email. You may later change your selection or discontinue this service.

Merck KGaA of Darmstadt, Germany, is a leading company for innovative and top-quality high-tech products in healthcare, life science and performance materials. The company has six businesses – Biopharmaceuticals, Consumer Health, Allergopharma, Biosimilars, Life Science Tools and Performance Materials – and generated total revenues of € 11.1 billion in 2013. Around 39,000 employees work in 66 countries to improve the quality of life for patients, to foster the success of customers and to help meet global challenges. Merck KGaA, Darmstadt, Germany, is the world's oldest pharmaceutical and chemical company



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– since 1668, the company has stood for innovation, business success and responsible entrepreneurship. Holding an approximately 70% interest, the founding family remains the majority owner of the company to this day. Merck KGaA, Darmstadt, Germany holds the global rights to the Merck name and brand. The only exceptions are Canada and the United States, where the company operates as EMD Serono, EMD Millipore and EMD Performance Materials.

In 2014, Merck KGaA, Darmstadt, Germany, completed the acquisition of AZ Electronic Materials into its Performance Materials business sector, making it a leading solutions provider in the premium segment of high-tech materials and functional specialty chemicals. AZ now operates as a product brand under the Merck KGaA, Darmstadt, Germany, branding umbrella. AZ materials are widely used in integrated circuits and devices, flat panel displays, and light-emitting diodes.