

## News Release

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# The Electronics business of Merck KGaA, Darmstadt, Germany Launches New Green Solvents for Photoresist Removal in Chip Production

- **High throughput and environment-friendly removal processes thanks to newly launched product portfolio**
- **Powerful turnkey solutions and improved cost of total ownership set to make a huge impact in the wet chemical market**
- **Reinforces commitment to driving innovation in products and technologies for a sustainable future**

Darmstadt, Germany, July 22, 2021 –The Electronics business of Merck KGaA, Darmstadt, Germany, today announced the launch of a new line of complementary green solvents for use in photolithographic processes in semiconductor manufacturing. The growing demand for electronic devices, such as smartphones, 5G functionality, gaming, and home entertainment, automotive applications, Internet of Things (IoT), and Artificial Intelligence (AI) has propelled the growth of the semiconductor industry, thereby augmenting the growth of wafer cleaning solvents and equipment. AZ<sup>®</sup> 910 Remover is a new line of formulated, NMP-free (N-methylpyrrolidone) based chemistries designed for faster dissolution of photoresist patterns in a cost-effective way. The portfolio is making a huge impact in the semiconductor wet chemical market with its outstanding environmental footprint, simple usage in a broad variety of tools, and excellent resist-dissolution performance.

"Our company has developed an innovative, cost-effective solution to support our customers with their advanced cleaning needs integral to realizing next-generation chips. AZ<sup>®</sup> 910 Remover is capable of stripping the resist using less than three times



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the solvent volume, saving customers money, and reducing the environmental footprint of materials entering the global waste stream. Sustainability is an essential element of our corporate strategy and we are committed to developing products and technologies that create long-term value for our customers while balancing environmental needs," said Anand Nambiar, Global Head, Semiconductor Materials.

Semiconductor production facilities traditionally use negative-tone photoresists, which undergo chemical reactions (crosslinking) to make the resist more suitable for photolithographic processes. However, this crosslinking makes the resist more difficult to dissolve and remove, impacting both the business and the planet. The formulated cleans available in the market cannot meet the increasing industry requirements for high-performance, sustainable chemistries that consume fewer solvents.

Targeting the microelectromechanical systems (MEMS), automotive, power IC (integrated circuits), and wafer-level packaging device markets, the AZ<sup>®</sup> 910 Remover portfolio offers an alternative solution to complex and costly NMP-based chemistries. The innovative product dissolves both negative and positive tone photoresists rather than lifting them from the wafer surface as with current NMP-based offerings. This novel approach cuts the removal process time in half, extends chemistry and filter lifetimes, and allows manufacturers to realize a significant improvement in their cost of ownership without investing in high-end removers required for advanced processors.

"The unrivaled dissolving performance is a major advantage for customers looking to reduce product costs and improve production throughput," adds Anand Nambiar. "The product's purely green chemistry dramatically improves the environmental footprint of each production facility, allowing customers to simplify their wet chemical processes. With just a single gallon of AZ<sup>®</sup> 910 Remover, users can clean more than 250 8-inch wafers with 80% coverage of a negative-tone resist. It's not possible to achieve anywhere near these kinds of results with existing solutions."

High-purity cleans are critical components in the chip-making process. When materials are transferred onto a silicon wafer, a meticulous cleaning step is needed after every application to remove unwanted residues from the wafer. As chips

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continue to shrink, the demand for advanced, high-performance, and environment-friendly cleans is growing.

Merck KGaA, Darmstadt, Germany is an important player in the fast-growing semiconductor cleans market with a broad portfolio of solutions covering all steps of the photolithography process. This offers a unique opportunity to innovate and develop breakthrough products that meet the identified challenges in the cleans marketplace.

### **AZ® 910 Remover features**

AZ® 910 Remover is suitable for processes where sensitive metals (aluminium, copper, titanium, tungsten, tungsten-titanium, tin, nickel) and other materials, including silicon, silicon oxide and common interconnect materials, are exposed. It is compatible with batch immersion tools (wet benches), batch spray tools and combination immersion/high-pressure spray tools. Common applications include metal lift-off, RDL (redistribution layer), copper electroplating, and general positive and negative resist removal. In addition to eliminating NMP, the environmentally friendly product contains no dimethylacetamide (DMAC), dimethyl sulfoxide (DMSO) or tetramethylammonium hydroxide (TMAH).

AZ® 910 Remover is now commercially available in the market, with additional products in the family to be announced shortly.

### **Over 100 years of expertise in electronic materials**

With more than 100 years of electronic materials expertise, Merck KGaA, Darmstadt, Germany is working on novel innovations in different segments of the semiconductor manufacturing cycle to provide better-integrated solutions to its customers. The company has broadened its product portfolio via acquisitions over the past years to become a leading player in front and back-end semiconductor manufacturing, it is the only enterprise in the semiconductor ecosystem to participate in all seven critical front and back-end unit operations—doping, patterning, deposition, planarization, etching, and cleaning, as well as back-end packaging. The acquisition of [Intermolecular](#) in 2019 added electrical validation capability to help plug innovation gaps between steps. This enables the industry to get "better shots on goal" and ramp up production faster by reducing trial and error during integration. The

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company's expertise extends beyond materials and includes delivery tools, equipment, containers, and services.

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### **About the Electronics business of Merck KGaA, Darmstadt, Germany**

The Electronics business of Merck KGaA, Darmstadt, Germany, operates as EMD Electronics in the United States and Canada. Its portfolio covers a broad range of products and solutions, including high-tech materials and solutions for the semiconductor industry as well as liquid crystals and OLED materials for displays and effect pigments for coatings and cosmetics. Today, the Electronics business in the United States has approximately 2,000 employees around the country with regional offices in Tempe (AZ) and Philadelphia (PA).

Merck KGaA, Darmstadt, Germany, a leading science and technology company, operates across healthcare, life science and electronics. Around 58,000 employees work to make a positive difference to millions of people's lives every day by creating more joyful and sustainable ways to live. From advancing gene editing technologies and discovering unique ways to treat the most challenging diseases to enabling the intelligence of devices – the company is everywhere. In 2020, Merck KGaA, Darmstadt, Germany, generated sales of € 17.5 billion in 66 countries.

The company holds the global rights to the name and trademark "Merck" internationally. The only exceptions are the United States and Canada, where the business sectors of Merck KGaA, Darmstadt, Germany operate as EMD Serono in healthcare, MilliporeSigma in life science, and EMD Electronics. Since its founding in 1668, scientific exploration and responsible entrepreneurship have been key to the company's technological and scientific advances. To this day, the founding family remains the majority owner of the publicly listed company.