

Turn-key ALD solutions for MEMS manufacturing from Picosun

ESPOO, Finland, 29th November, 2017 – Picosun Oy (Finland), Silex Microsystems AB (Sweden), and Pegasus Chemicals Ltd (UK) have joined forces to develop and provide novel ALD (Atomic Layer Deposition) solutions and processes for MEMS (MicroElectroMechanical Systems) industries. The aim of the collaboration is to realize emerging, advanced MEMS structures that would not be possible to manufacture by any other thin film deposition methods.

Today, MEMS are crucial components in several everyday applications such as mobile phones, cars and in various sensor systems. In addition to these already vast markets, the rapidly spreading Internet-of-Things with its billions of independently communicating electronic devices is a huge driving force to accelerate MEMS industry's exponential growth in the very near future.

In the Picosun-Silex-Pegasus collaboration, a PICOSUN™ ALD cluster platform is installed at Silex's MEMS foundry in Järfälla, Sweden. The platform consists of a fully automated, factory integrated cassette-to-cassette vacuum robot for substrate handling and a PICOSUN™ P-300F ALD reactor capable of coating up to 25 pcs 8" wafers in a batch. The installed reactor can deposit various metal oxides, metal nitrides, and pure metals on up to tens of thousands of wafers per month (*). Pegasus develops and manufactures the precursor chemicals required for the ALD processes and provides the technical support and delivery options for individual applications. The cluster platform can be later upgraded with two additional ALD reactors. In the collaboration, engineers and scientists from all three partners work together to solve existing problems in MEMS processing, as well as to develop completely new openings on how to realize novel MEMS devices.

"We have been working with Picosun since 2010 and now with this project we can bring our collaboration to a completely new level. We are very excited to have the PICOSUN™ ALD cluster platform in our cleanroom. It enables us to develop novel, production-proven ALD solutions for our customers in advanced MEMS applications," says Dr. Niklas Svedin, Vice President of Engineering at Silex Microsystems.

"This is a valuable project for us, as the use of ALD in MEMS processing is increasing very fast. We have already strong presence in the MEMS market, but new applications come up weekly and we want to keep our spearheading position in this development. Now in the SALADIN project we have partners with whom we can also test and develop new ideas of our own how ALD could be implemented in the MEMS process flow," continues Mr. Juhana Kostamo, Managing Director of Picosun.

"The MEMS industry is a fast-growing market and it is very interesting for us to be involved in the process of introducing the groundbreaking ALD cluster platform to it. We are eager to be in the frontline of the



chemical development for this field and focusing on advanced MEMS applications,” summarises Dr. Paul Williams, Technical Director of Pegasus Chemicals.

(*) Throughput calculated for 10 nm Al₂O₃, 90% system uptime.

Picosun provides the most advanced ALD thin film coating technology to enable the industrial leap into the future, with turn-key production solutions and unmatched expertise in the field. Today, PICOSUN™ ALD equipment are in daily manufacturing use in numerous major industries around the world. Picosun is based in Finland, with subsidiaries in Germany, North America, Singapore, Taiwan, China, and Japan, and a world-wide sales and support network. www.picosun.com

Silex Microsystems is the world's largest Pure Play MEMS foundry bringing advanced process technologies and 200mm wafer volume manufacturing capacity to a wide range of high-tech companies and innovation leaders in the MEMS industry. Silex dedication to the true Pure Play model and protection of customer IP means that we explicitly stay away from product technology development and focus our R&D efforts on generic process blocks and processing capabilities that our customers can incorporate into their product designs to create the most competitive solutions. Examples of such generic technology nodes developed by Silex pertain to the packaging and interconnect space such as TSV's (Sil-Via®, Met-Via® and TGV), 2.5D Interposers and low temperature wafer bonding technologies for Wafer Level Integration of MEMS and CMOS. Other areas where Silex is offering leading production technology nodes are in the processing capability of novel materials such as AlN, PZT, thick polymers, magnetic materials and a wide range of alloys and noble materials. www.silexmicrosystems.com

Pegasus Chemicals is a supplier of high purity precursors for semiconductor and material science applications. Pegasus uses advanced manufacturing and purification techniques, which are underpinned with analytical capabilities to measure ppb level metals and oxygen impurities to ensure the delivered product is suitable for the application. Based in the UK, Pegasus has long term proven specialist chemistry, deposition and application knowledge to support our global customers, with both standard and novel precursors used in multiple applications and emerging technologies. Pegasus provides primary research and development to support technology and innovation. www.pegasuschemicals.com

The Picosun-Silex-Pegasus collaboration is carried out in the European Union funded project SALADIN (project number 779 786) starting in November 2017 and running to October 2010. The project SALADIN is coordinated by Picosun.

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