



Beneq and Exosens Collaborate on Lead-Free MCPs with ALD, Enhancing Precision, Performance, and Manufacturing Efficiency

ALD enables lead-free MCP production with precise thin-film deposition, enhancing manufacturing yields, device performance, and lifetime value. Exosens chose Beneq's P400A batch and TFS 500 ALD systems for their scalability, precision, and ability to support development from R&D to production.



Espoo, Finland, 06 Mar 2025 – Beneq and Photonis Scientific, part of the Exosens Group, have announced a significant advancement in Microchannel Plate (MCP) technology. This collaboration focuses on replacing traditional lead-based materials with ALD-enabled solutions, driving sustainable MCP manufacturing and unlocking new commercial opportunities for this versatile detection technology.

Unlocking New Potential in MCP Technology

Microchannel Plates (MCPs) are essential components in a variety of high-performance detection systems, from medical imaging and mass spectrometry to neutron imaging and scientific instrumentation. Historically manufactured using lead-silicate glass, MCPs are now transitioning to lead-free alternatives to comply with environmental regulations and improve long-term sustainability.

ALD technology plays a central role in this shift by enabling precise, conformal deposition of thin films. This approach decouples the properties of the glass substrate from those of the conductive and electron emissive coatings, allowing each to be independently optimized. The result is better performance, higher manufacturing yields, and greater flexibility to tailor MCPs to the demands of growing commercial markets.

Sustainability and Performance Gains with ALD

ALD enables MCP manufacturers to eliminate hazardous materials while achieving higher performance benchmarks. Lead-free MCPs produced using ALD deliver key benefits, such as enhanced stability, reduced noise, lower operational voltages, and minimized power consumption. ALD also supports advanced MCP designs that maintain performance under harsh conditions and extend device lifespan by up to 10 times compared to conventional methods.

“The introduction of ALD into MCP production marks a significant step forward for the industry,” said Ulrich Laupper, President and Executive General Manager of the Exosens Ultimate Detection Business Unit. “By leveraging ALD technology, we can align sustainability with high-performance detection solutions, addressing today’s market needs while preparing for future applications.”

Enabling Growth in MCP Markets with Beneq’s ALD Solutions

Photonis Scientific partnered with Beneq for its customizable [TFS 500](#) ALD system, which supports MCP development at all stages—from R&D and pilot production to full-scale manufacturing. Beneq’s modular tool designs enable precise control over deposition parameters, meeting the rigorous requirements of MCP coatings while ensuring scalability and cost-efficiency.

“Beneq’s ALD tools provide the flexibility and precision we need to refine MCP coatings and scale our production,” said Till Cremer, R&D Scientist at Photonis Scientific. “Their tailored solutions have allowed us to unlock new potential in MCP technology and enhance its value for commercial applications.”

By fostering collaborations like this, Beneq is working to establish a growing market for ALD-enabled MCP technologies. The ability to tailor performance parameters such as operational stability, noise reduction, and power efficiency is positioning MCPs as a key detection technology across a wide range of industrial, medical, and scientific fields.

About Photonis

Photonis is a leading product brand of Exosens, a high-tech company with more than 85 years of experience in the innovation, development, manufacture and sale of high-end electro-optical technologies. Photonis offers its customers photo-detection and low light conditions imaging solutions for extremely demanding environments such as Defense & Security, Nuclear Safety, Life Science and Industrial & Non-Destructive testing. Photonis is internationally recognized as a leading brand and a major innovator in its fields with production and R&D sites in Europe and North America.

For more information: [exosens.com](https://www.exosens.com)

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About Beneq

Beneq is the home of Atomic Layer Deposition (ALD). Founded in 1984, Beneq introduced the first industrial ALD production and continues to lead the market with solutions for R&D, semiconductor fabrication, and advanced manufacturing. Beneq's product portfolio includes tools for lab-scale research (TFS 200, TFS 500), high-volume production (Transform®, Prodigy™), ultra-fast spatial ALD (C2R), and roll-to-roll ALD (Genesis).

Beneq's Development Service accelerates the adoption of new ALD processes, while its Coating Service offers streamlined, state-of-the-art ALD production capabilities. Beneq's mission is to enable groundbreaking applications with ALD technology, providing unparalleled precision and scalability for researchers and manufacturers worldwide.