

PRESS RELEASE

BELVAL – 20 SEPTEMBER 2023

LIST INTRODUCES NEW PVD PILOT LINE AS A MAJOR STEP FORWARD IN MATERIAL COATING TECHNOLOGY

The 18-metre semi-industrial equipment addresses challenge related to scalability, autonomous manufacturing and technology transfer.

On Wednesday, 20 September, the Luxembourg Institute of Science and Technology (LIST) inaugurated a Physical Vapor Deposition (PVD) pilot line in its Hautcharage premises, marking a significant milestone in the advancement of coating technology. With almost two decades of dedicated research and development in PVD, LIST is poised to transform the industry landscape in Luxembourg and the Greater Region by addressing challenges related to scalability and innovation.

PVD, a widely recognized coating technique, is known for its ability to deposit thin functional layers onto various surfaces to give them a hard durable coating, offering diverse applications spanning for example optical materials, hard coatings, and sensing materials. Despite its potential, the transition from laboratory-scale operations to semi-industrial production has posed a hurdle for innovation that Research and Technology Organizations (RTOs) like LIST have to tackle.

The newly inaugurated PVD pilot line represents a solution to this challenge. The semi-industrial tool serves as a substantial platform for scaling up PVD processes and validating cutting-edge manufacturing techniques. It combines two distinct lines, each tailored for different purposes, making it a versatile asset for LIST's research and industry partners.

One side of the equipment is dedicated to R&D upscaled experiments advancing intelligent processing technologies. Unlike traditional manufacturing approaches, this equipment boasts the ability to adapt to process variations in real-time without human intervention, enhancing robustness and adaptability.

The second segment focuses on conducting experiments, ensuring continuous coating deliveries, and validating new processes through a conventional manufacturing approach. This dual-functionality underscores LIST's ambition to cater to both short-term innovation validation and advanced process development.

Measuring 18 meters in length, the PVD pilot line can accommodate substrates with a total surface area of approximately 1.6 meters by 1.2 meters, making it approximately ten times larger than typical laboratory setups. It accommodates a wide range of substrates, including glass, foils, plastics, metals, ceramics, and more, all while possibly operating at low temperatures to suit temperature-sensitive materials.

The PVD line allows for the growth of extremely thin layers on substrates, each with varying properties, including optical attributes, electronic qualities, resistance to scratches or corrosion, and many more. Its multiple chambers facilitate sequential processing within a high-vacuum environment, ensuring precision and controlled conditions.

Dr Damien Lenoble, director of the Materials Research and Technology Department (MRT) at LIST said, "The process of innovation remains incomplete until it is successfully integrated by the industry onto the market. With its production line setup closely mimicking real-world coating processes, LIST's PVD pilot line addresses the challenge of demonstrating the scalability of laboratory-scale results onto the industry, sharing risks for potential industry partners and advancing innovations to a technology readiness level for market transfer."

In the context of Luxembourg's thriving coating industry, this pilot line is a valuable resource for small and large companies such as Ceratizit, Webasto, Guardian, Circuit Foil, MetLux, Rotatex or ArcelorMittal, enabling

collaborative development of innovative coatings for seamless integration into their products. Its uniqueness extends beyond Luxembourg, with no other facility in Western Europe offering comparable capabilities.

LIST has also signed a Memorandum of Understanding (MOU) with Webasto, market leader in automotive roof systems based out of Germany, with a prominent presence in Luxembourg. Michael Bard, Senior Director at Webasto Luxembourg S.A. said, "The new PVD pilot line is the bridge required to scale up from lab-based development to industrialization towards High-Tech Glass. We believe with LIST's R&D support we can take our technological expertise in our Glass Research Center to the next level to create something that is not yet available in the market."

Claude Meisch, Minister of Higher Education and Research, said: "With the commissioning of the new PVD pilot line, LIST has taken a significant step forward, enabling even more technologically ambitious research projects in the fields of materials coating technology to be carried out, especially on a pre-industrial scale in collaboration with industry leaders. Thus, the new infrastructure is clearly in line with the national research and innovation strategy, which advocates the establishment of public private partnerships".

About LIST

The Luxembourg Institute of Science and Technology (LIST) is a research and technology organization (RTO) under the auspices of the Ministry of Higher Education and Research, and its mission is to develop competitive and market-oriented prototypes of products and services for public and private stakeholders.

With nearly 680 employees, 77% of whom are researchers or innovators from all over the world, LIST is active in the fields of information technology, materials, space resources and the environment, and works across the entire innovation chain, from basic and applied research to technology incubation and transfer.

By transforming scientific knowledge into intelligent technologies, data and tools, LIST:

- helps European citizens make informed choices
- helps public authorities make decisions
- encourages companies to develop

For more information about the Luxembourg Institute of Science and Technology, please visit: <https://www.list.lu/>

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