



PVD Technology for Science: The University of Bayreuth Explores New Frontiers with Oerlikon

Innovative research powered by the DOMINO pica PVD system: Maximum flexibility for pioneering developments in tribology and surface engineering

The Chair of Engineering Design and CAD at the University of Bayreuth, led by Prof. Dr.-Ing. Stephan Tremmel places a strong emphasis on materials science and engineering. To further advance research in the field of tribology and surface technology, the university acquired the state-of-the-art DOMINO pica PVD coating system from Oerlikon.

This system is primarily used for research on leading edge thin-film formulations for a wide range of technical applications. In addition to optimizing tribological contacts in mechanical components, the coatings are also being explored for sensor technologies and energy harvesting through triboelectric nanogenerators (TENGs).

Opening new perspectives in research

Until recently, the University of Bayreuth did not have access to a latest-technology PVD coating system to support the development of new coatings. The acquisition of the DOMINO pica has now closed this gap. Prof. Tremmel highlights that the system's compact

FACTBOX



University of Bayreuth / Germany

<https://www.uni-bayreuth.de/en>

Faculty of Engineering Science
Chair of Engineering Design and CAD

DOMINO pica

Research Focus:

- Novel thin-film coatings
- Optimization of tribological contacts
- Sensor applications

Key Advantages:

- Modular system design
- Flexible process control
- Freely programmable HiPIMS pulser
- Innovative etching process with AEGD

chamber volume makes it ideally suited for academic research, enabling a direct transfer of developed coatings to industrial applications while also conserving resources during coating development.

Modularity and flexibility as key advantages

DOMINO systems are characterized by their modular architecture, which allows for flexible control – independent of preset recipes or parameter limits. Academic researcher and doctoral candidate Christian Orgeldinger is particularly impressed with the freely programmable HiPIMS pulser, which is synchronized via a frequency generator and opens up entirely new possibilities for process control.

Equipped with three magnetrons and the innovative AEGD etching process, the DOMINO pica offers an optimal platform for experimental research.



Promising first research results

Since the system was commissioned, the team has primarily studied DLC (diamond-like carbon) coating formulations, which have already shown great promise. The university is conducting in-depth analyses, including layer structure, adhesion, chemical and mechanical properties, as well as tribological and electrical behavior.

Expert guidance for a tailored PVD system

The University of Bayreuth values the comprehensive support provided by Oerlikon Balzers – from system configuration and delivery to commissioning and ongoing technical assistance. The research team particularly appreciates Oerlikon Balzers' genuine interest in innovative and unconventional research topics, which reflects the company's commitment to fostering real partnerships with academic institutions.

Modular systems for university research and development

As the most compact model in the DOMINO family, the DOMINO pica exemplifies the benefits of modular coating systems for universities and research institutes. Its flexible platform allows tailored module integration to meet specific research needs – laying the foundation for new developments in surface and coating technologies.

About Oerlikon

Oerlikon (SIX: OERL) is a global leader in surface technologies and advanced materials. With a unique portfolio spanning surface engineering, high-performance materials, coating equipment and components, we make products better by enhancing performance, efficiency and sustainability. Oerlikon serves a wide range of industries, including aerospace, automotive, defense, energy, medical, luxury and semiconductors.

Headquartered in Pfäeffikon, Switzerland, Oerlikon together with its subsidiary Barmag operates in 38 countries with more than 12,000 employees across 199 locations, achieving sales of CHF 2.4 billion in 2024.

Oerlikon Balzers Coating Germany GmbH | Am Böttcherberg 30-38 | DE-51427 Bergisch Gladbach Deutschland | +49 2204 299-0
www.oerlikon.com/balzers/de/de/

