FRAUNHOFER INSTITUTE FOR PHOTONIC MICROSYSTEMS IPMS

PRESS RELEASE

A platform for industry-oriented cutting-edge research: Optical metrology for semiconductor and materials characterization

Fraunhofer IPMS and PVA TePla establish the "Center of Excellence for Advanced Metrology" in Dresden

- A platform for industry-oriented cutting-edge research using optical metrology for semiconductor and materials characterization
- PVA TePla measurement systems in Fraunhofer IPMS's 300 mm research cleanroom: equipped to match the cleanrooms of major semiconductor fabs
- Semiconductor manufacturers and suppliers can test measurement methods using their own wafers under conditions closely resembling those in a fab

The Fraunhofer Institute for Photonic Microsystems IPMS and PVA TePla are pooling their expertise to establish the "Center of Excellence for Advanced Metrology" (CEAM), based at Fraunhofer IPMS in Dresden, Germany. The strategic partnership aims to make PVA TePla's state-of-the-art metrology available to industry and research and to jointly advance optical measurement methods for semiconductor and materials analysis.

At the heart of CEAM is Fraunhofer IPMS's 300 mm research cleanroom in northern Dresden, which is equipped to comparable standards to the cleanrooms of major semiconductor fabs. Wafers can therefore be transferred between industrial production cleanrooms and CEAM and analyzed under realistic conditions. This enables companies to test measurement methods on the available systems using their own wafers and evaluate their suitability for their processes – without having to install the systems in their own production facilities first.

Highly specialized measurement systems from PVA TePla form the technical backbone of CEAM, supporting critical steps in semiconductor production and quality assurance. The VEreveal fusion hyperspectral system is already in operation for precise material characterization. It will soon be joined by LuXpector THEA, which combines ellipsometry and reflectometry for the nondestructive analysis of thin films. In the longer term, CEAM is set to be expanded with additional systems from PVA TePla's portfolio: In addition to a system for measuring wafer stress (SIRD), an acoustic microscopy system is planned to complement the focus on optical metrology.

"Our goal is to set new standards in nondestructive material analysis," says Martin Landgraf, project manager at Fraunhofer IPMS. "The focus is on benefits for industry: High-precision material analysis is intended to help make manufacturing processes in the semiconductor industry more efficient."

"With CEAM, we are bringing our metrology into an environment that matches a modern semiconductor fab," says Dr. Philipp Wollmann, Managing Director of PVA

Editor
Sebastian Gonsior | PVA Tepla | Telefon +49 641 68690-419 | ir@pvatepla.com
Franka Balvin | Fraunhofer Institute for Photonic Microsystems IPMS | Phone +49 351 8823-1144 | Maria-Reiche-Straße 2 | 01109 Dresden | www.ipms.fraunhofer.de | franka.balvin@ipms.fraunhofer.de

Vision. "Located in the heart of Europe's most important microelectronics cluster, the center enables customers to test our systems using their own wafers under real production conditions. This can significantly shorten evaluation and qualification processes. At the same time, we benefit from direct feedback from the experts at Fraunhofer IPMS, which feeds straight into the further development of our products."

Through CEAM, Fraunhofer IPMS and PVA TePla are strengthening Dresden's position as a hub for semiconductor technologies in Europe. The partnership combines industry-oriented cutting-edge research with applied metrology, providing an important boost to "Silicon Saxony." Additional benefits will arise from CEAM's integration into the European APECS pilot line (APECS – *Advanced Packaging and Heterogeneous Integration for Electronic Components and Systems*), which makes state-of-the-art production technologies available for new semiconductor products as part of the EU Chips Act.

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About Fraunhofer IPMS
Fraunhofer IPMS is a world-renowned research and development service provider specializing in electronic and photonic microsystems. Our technologies are used in industries such as mobility, biotechnology, and medical technology. We are also addressing key future fields, such as quantum technologies and neuromorphic computing. Through our research in green microelectronics, we contribute to a sustainable and resource-efficient world. With its Center Nanoelectronic Technologies (CNT), Fraunhofer IPMS offers applied research on 300 mm wafers for microchip manufacturers, suppliers, equipment manufacturers and R&D partners.

About PVA TePla
PVA TePla is a leading high-tech company specializing in materials technology and metrology. Founded in 1991, the system supplier develops and manufactures customized solutions for high-precision material production, refinement and processing (Material Solutions), as well as systems for inspecting materials and components using acoustic, optical and wet-chemical methods (Metrology).
PVA TePla has an international presence, with locations in Europe, Asia and North America. Headquartered in Wettenberg, Hesse, Germany, the company employs around 1,000 people worldwide. It is listed in the TecDAX and SDAX indices. Shares in PVA TePla AG are traded on XETRA, Tradegate and Germany's regional stock exchanges (ISIN DE0007461006, WKN 746100).

Fraunhofer IPMS contact
Franka Balvin
+49 351 8823-1144
franka.balvin@ipms.fraunhofer.de

PVA TePla contact
Sebastian Gonsior
+49 641 68690-419
ir@pvatepla.com

Images



Prof. Wenke Weinreich, Director of Fraunhofer IPMS, and Jalin Ketter, CEO of PVA TePla AG, at SEMICON Europa 2026 in Munich.
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A view inside the 300 mm cleanroom at Fraunhofer IPMS's Center Nanoelectronic Technologies (CNT) in Dresden.
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