

CAM IS A COMPETENCE CENTER FOR
MICROSTRUCTURE DIAGNOSTICS
AND MATERIAL CHARACTERIZATION
WITHIN FRAUNHOFER IMWS IN HALLE

CENTER FOR APPLIED MICRO- STRUCTURE DIAGNOSTICS

The Center for Applied Microstructure Diagnostics is a leading service provider for failure diagnostics and materials assessment. Contract R & D for industry, semiconductor technologies, microelectronic components, microsystems and nanostructured materials is our day-to-day business.

At CAM, we cover the entire work flow from non-destructive defect localization over high precision target preparation to cutting edge nanoanalytics supplemented by micro-mechanical testing, finite element modelling and numerical simulation. In preparation for future challenges, we do accomplish intense forefront research in cooperation with international partners.

CONTACT US

Prof. Dr. Thomas Höche
Center for Applied Microstructure Diagnostics
Fraunhofer IMWS
Heideallee 19 (office) | Walter-Huelse-Strasse 1 (mail)
06120 Halle, Germany

Phone +49 (0) 345 5589-197
thomas.hoeche@imws.fraunhofer.de
www.cam.fraunhofer.de

MAJOR APPLICATIONS

Electronics and microsystem technologies:

- Si-based semiconductor IC technologies (CMOS, BiCMOS, HV CMOS)
- Optoelectronics and HF electronics
- Power electronics
- Organic electronics
- Microelectronics packaging
- Advanced 3D System Integration
- Interconnecting materials for photovoltaics (cooperation with Fraunhofer CSP)
- MEMS and actuators
- Sensor materials

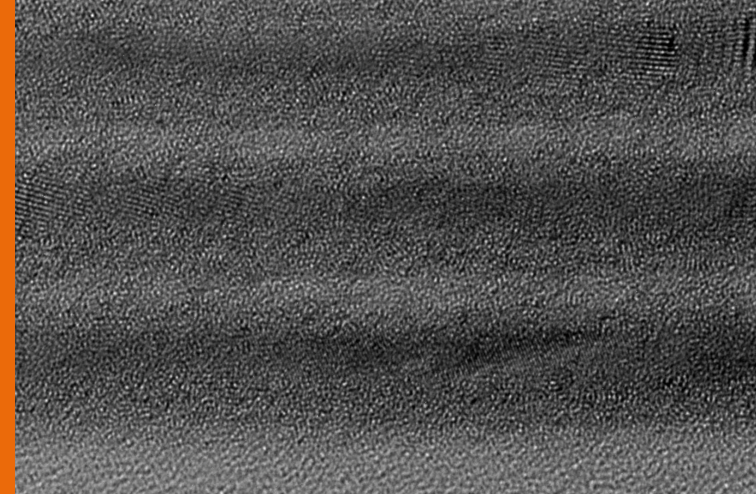
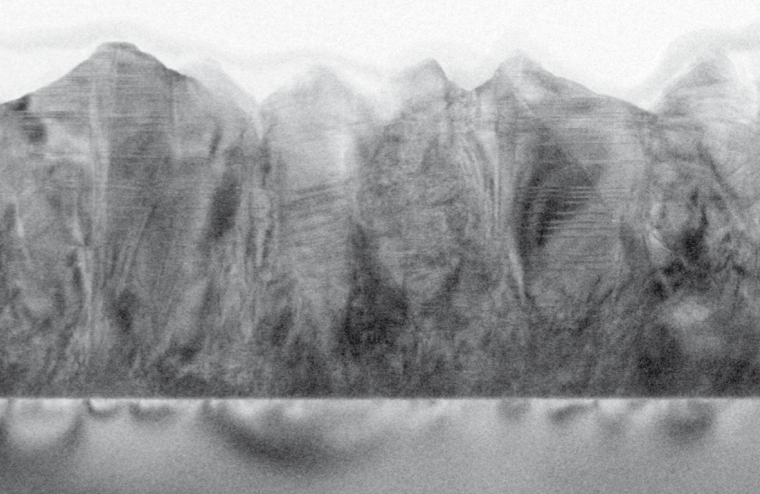
Nanotechnologies:

- Pigments and nanoparticles
- Optical coatings
- Nanostructured glasses, ceramics and glass ceramics
- Selected health care materials

FRAUNHOFER IMWS
CENTER FOR APPLIED MICROSTRUCTURE DIAGNOSTICS

COATINGS





COATINGS

At the surface of materials, interaction with the environment takes place. In many cases, the functionality of the bulk material requires modification of its surface prior to application. Examples include optical coatings to reduce reflexion losses or structural coatings to improve wear resistance. In other cases, the coating itself is the functional structure and the substrate serves just as its support.

The latter situation is encountered for dielectric laser mirrors, multilayers for EUV light, or reactive multilayers. Independent of the coatings' function, microstructure diagnostics is a key tool to improve performance. At CAM, we hold available all necessary equipment and expertise to investigate the structure and chemistry of coatings down to the atomic scale.

Adequate and artifact-free sample preparation is key for nanostructure diagnostics in general and to the characterization of coatings in particular. For this purpose, we have manifold routes, ranging from the fabrication of lift-out lamella by focused ion-beam machining to mechanical, laser-based sample preparation, and low-energy Ar⁺ ion polishing, on our disposal.

OUR SERVICES

- Dedicated delamination analyses
- Customized thermography imaging to identify flaws and defects
- Chemical depth profiling using highly sensitive surface analysis methods
- Determination of surface topography on the micron- and nanoscale
- Investigation of the mechanical properties of coatings
- Texture analysis and determination of orientation distributions
- Atomic-resolution imaging and chemical analyses at bulk materials and cross-sections
- 3D-inspection of the microstructure
- Laser modification of surfaces and coatings
- Chemical trace analyses using a multitude of spectroscopic techniques

EQUIPMENT

- Scanning Acoustic Microscopes
- Lock-in-Thermography
- 2D X-Ray inspection and 3D tomography
- Short pulsed laser micromachining
- Combined laser and FIB milling
- High current Ga-FIB
- High current Xe-Plasma-FIB
- Combined FIB/SEM tools
- High-resolution SEM with EDXs and EBSD analytics
- High resolution TEM with EDX, EELS, and EFTEM (FEI Titan³ G2 80-300 [image corrector, high-brightness gun, SuperX detector], FEI Technai G2 F20)
- Time of flight secondary ion mass spectrometer
- X-ray photoelectron spectrometer
- Scanning probe microscopes