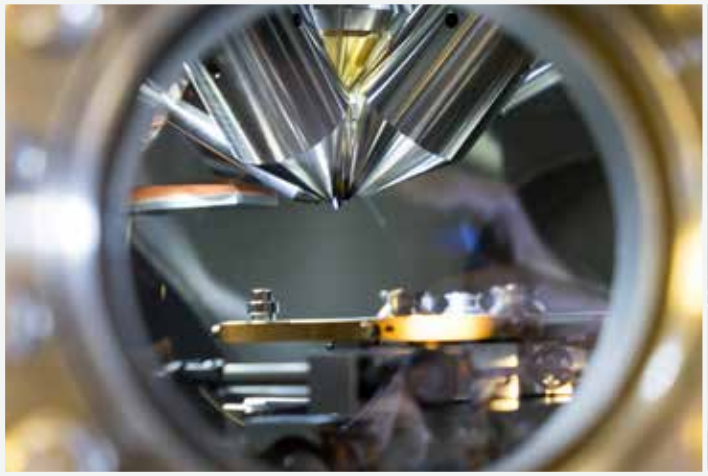




UNLOCK MATERIAL PERFORMANCE THROUGH THE POWER OF MATERIALS CHARACTERIZATION

eurofins | EAG Laboratories

Since its founding in 1978 as Charles Evans & Associates, the experts at Eurofins EAG have been involved in characterizing all types of materials for our customers. Historically, our customers were primarily focused on semiconductors. Over the decades, our customer base has expanded globally to support a wide range of industries where cleanliness, contamination control, and deep sample knowledge are essential. These include chip and IC manufacturing, AI and quantum computing, consumer products, optics and optoelectronics, communications and data storage, displays and lighting, energy technologies, aerospace and defense, pharmaceuticals, medical devices, biotechnology, and legal and intellectual property.

Why Choose Eurofins EAG for Materials Characterization?

The common thread between these diverse industries is the need for specific and accurate information about materials and processes. Manufacturing high-value products demands significant investment in materials, equipment and time. Ensuring that the right materials are used, and that each process performs exactly as intended, is therefore critical at every stage of the product life cycle, from early-stage R&D through to field returns from the marketplace.

Experience and Scientific Excellence

- The scientists at Eurofins EAG have unique expertise in acquiring high quality data using our extensive instrument base and turning raw data into extremely useful information to help our customers.
- With an extensive range of characterization tools, we solve diverse materials challenges under one roof, so you don't need to search for multiple labs. We're the materials experts, so you don't have to be.
- Our well-established, ISO-accredited measurements (ISO 9001:2015 and ISO 17025:2017) are regularly and independently audited and certified. Your intellectual property is protected through ISO 27001 compliance, along with custom protocols for physical and data security.

Understand Your Materials from Composition to Performance

What Can We Measure and What Does it Mean?

Our materials characterization team can measure a wide range of materials characteristics, depending on the instrumentation and methods used. We support every stage of the product life cycle by delivering critical insights through measurements of material identification, composition, contamination, surfaces, structures, layers, and key material properties. These analyses drive innovation in R&D, pinpoint root causes during failure analysis, ensure consistent quality in production, and maintain stable, reliable process control. By revealing how materials and interfaces truly behave, materials characterization data empowers you to better understand your materials to design better products and resolve issues faster.

Identification

Identification through materials characterization precisely reveals a material's chemical and elemental fingerprint, eliminating uncertainty and ensuring materials meet performance and quality specifications.

Composition

Composition analysis reveals exactly what a material is made of and in what proportions, helping prevent variability, reduce failures, and increase reliability.

Contamination

Contamination analysis detects trace organic, inorganic, and particulate contaminants at surfaces, interfaces, and within materials, protecting product quality, improving yields, and preventing costly failures.

Surface

Surface analysis delivers critical insight into the outermost layers of a material, helping customers understand interactions at surfaces and interfaces.

Structure

Structure analysis uncovers how a material's micro- and nanoscale structure drives performance, reliability, and failure, helping customers connect processing conditions to material behavior and product outcomes.

Layers

Layer insight through materials characterization reduces risk by uncovering hidden deviations in thickness, sequence, composition, or inter-layer contamination.

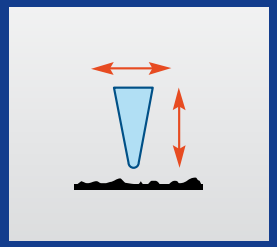
Materials Properties

Understanding mechanical, physical, and electrical properties helps optimize material selection, ensure reliability, and meet performance requirements across the product lifecycle.

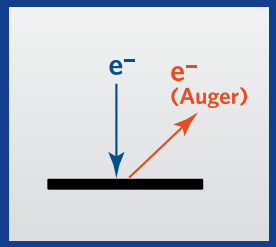
This table highlights the types of information that can be obtained with each technique. In many cases, more detailed and complex insights are achievable through extended data acquisition, advanced analysis, and by integrating results from multiple approaches.

Technique	Properties Measured	Additional Features
AFM (Atomic Force Microscopy) Advanced modes: SCM, sMIM, TUNA, SSRM KPFM, PFM	Topography and roughness Electrical and electromechanical responses	Qualitative physical and electrical properties Current, resistance, relative capacitance, doping type and relative doping levels, surface potential, and piezoelectric or ferroelectric response
AES (Auger Electron Spectroscopy)	Composition	Film thickness and mapping of small areas
FTIR (Fourier Transform Infrared Spectroscopy)	Identity	Material and contaminant ID
GCMS (Gas Chromatography Mass Spectrometry)	Identity	Solid, liquid or gas analysis
HFS (Hydrogen Forward Scattering Spectrometry)	Composition	Hydrogen content
IC (Ion Chromatography)	Concentration	Ions in solution
Nanoindentation	Hardness, modulus	Adhesion and many other nanomechanical physical properties
NanoIR	Identity	Vibrational spectroscopy on the AFM scale
OP (Optical Profilometry)	Roughness	Large areas
Particle Size	Particle size distribution	Diffraction and light scattering, in air or in suspension
PDF (Atomic Pair Distribution Function)	Local atomic ordering, structural disorder	Applicable to amorphous, nanocrystalline, and disordered materials
Raman Spectroscopy	Identity	Can provide unique information on carbon and some physical properties such as strain
RBS (Rutherford Backscattering Spectrometry)	Composition, thickness, density	Ion channeling, H content
Tensiometry + Viscometry	Density, surface tension, viscosity	Can also do interfacial surface tension in liquids and dynamic contact angle
TOF-SIMS (Time-of-Flight Secondary Ion Mass Spectrometry)	Molecular and elemental species	Sub-monolayer detection limits from surfaces
TXRF (Total Reflection X-ray Fluorescence)	Metallic surface contamination	All types of semiconductor wafers, quantitative, mapping, non-destructive
XPS (X-ray Photoelectron Spectroscopy)	Surface composition, chemical state	Film thickness, materials ID, sputter depth profiling
XRD (X-Ray Diffraction)	Phase ID and quantification, crystal structure, crystallinity	Thin film characterization, crystallite size, depth-sensitive analysis
XRF (X-Ray Fluorescence)	Composition	Film thickness, mapping, materials ID. Micro-XRF with 10µm spot size.
XRR (X-ray Reflectivity)	Thin film thickness, density, roughness	Multilayer stack analysis, interface quality

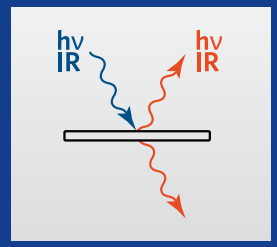
AFM



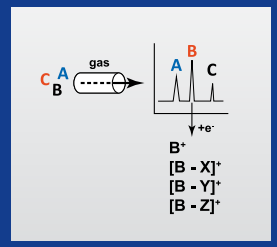
Auger



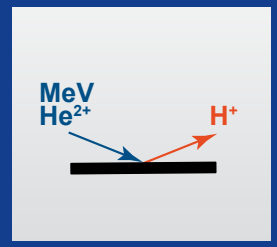
FTIR



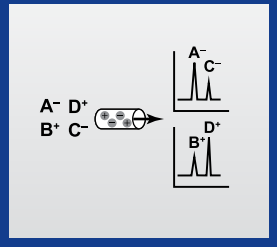
GCMS



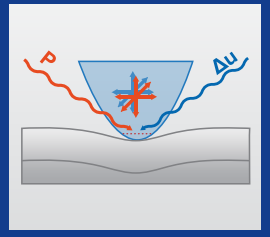
HFS



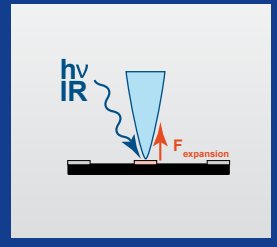
IC



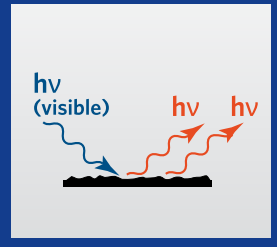
Nanoindentation



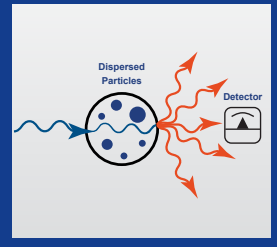
NanoIR



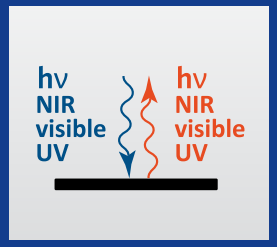
OP



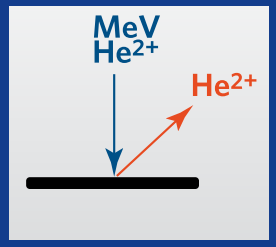
Particle Size



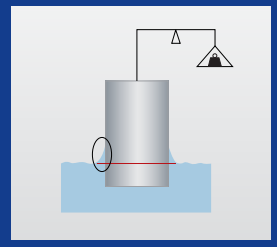
Raman



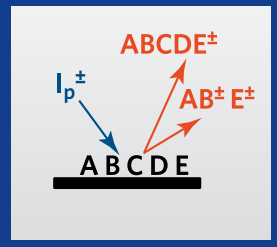
RBS



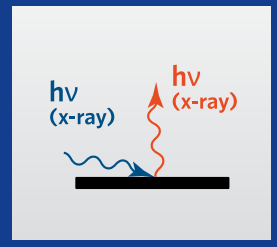
Tensiometry



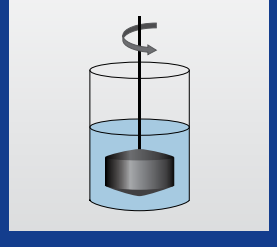
TOF-SIMS



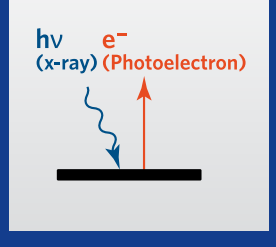
TXRF



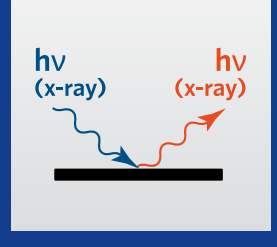
Viscometry



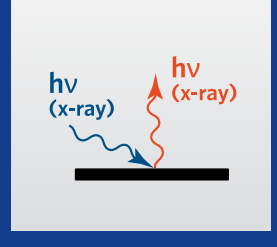
XPS



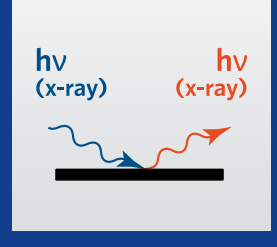
XRD



XRF



XRR



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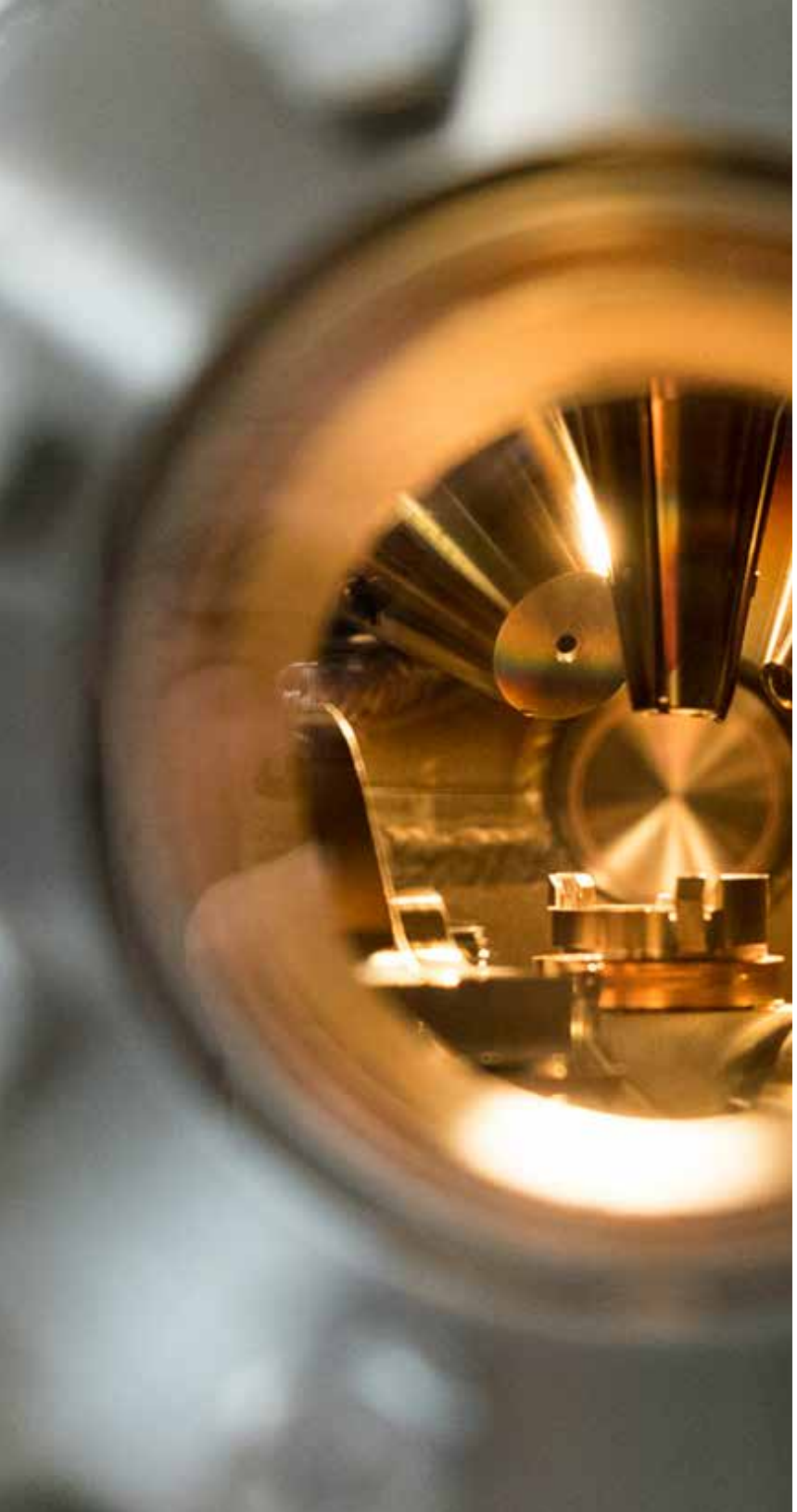
Solutions Beyond Single Techniques

We understand that EAG's broad range of capabilities can be difficult to keep track of, and we don't expect our customers to be experts in every technique. Your strength is in understanding your materials and processes; ours is in providing advanced materials characterization to support your objectives. As emerging materials continue to become more complex, we recognize that no single approach is sufficient and that each project requires a customized analytical strategy.

Very often, a combined analytical approach is required, whether using the materials analysis techniques discussed here or leveraging additional services across Eurofins EAG. Our broader expertise includes:

- Electronics Materials Analysis: SIMS, DHEM
- Advanced Microscopy: SEM, TEM, DB, and other microscopy techniques
- Elemental and Purity Analysis: GDMS, IGA, ICP-MS, ICP-OES, and more
- Polymer and Organic Analysis: LC-MS, GC-MS, GPC, and thermal analysis
- Battery/Energy Storage: Cycling, tear down, failure analysis, materials characterization
- Electrical/Device Failure Analysis

Eurofins EAG provides a fully integrated service. Our experts and project managers partner with you to design a scalable, comprehensive, or multi-stage analytical strategy tailored to your needs.



Guiding You Through Every Materials Challenge

From planning through interpretation, our experts provide hands-on guidance and a customized, integrated approach designed around your materials and goals. Whether you're troubleshooting, accelerating development, or validating performance, our comprehensive support ensures you get actionable answers, not just data.

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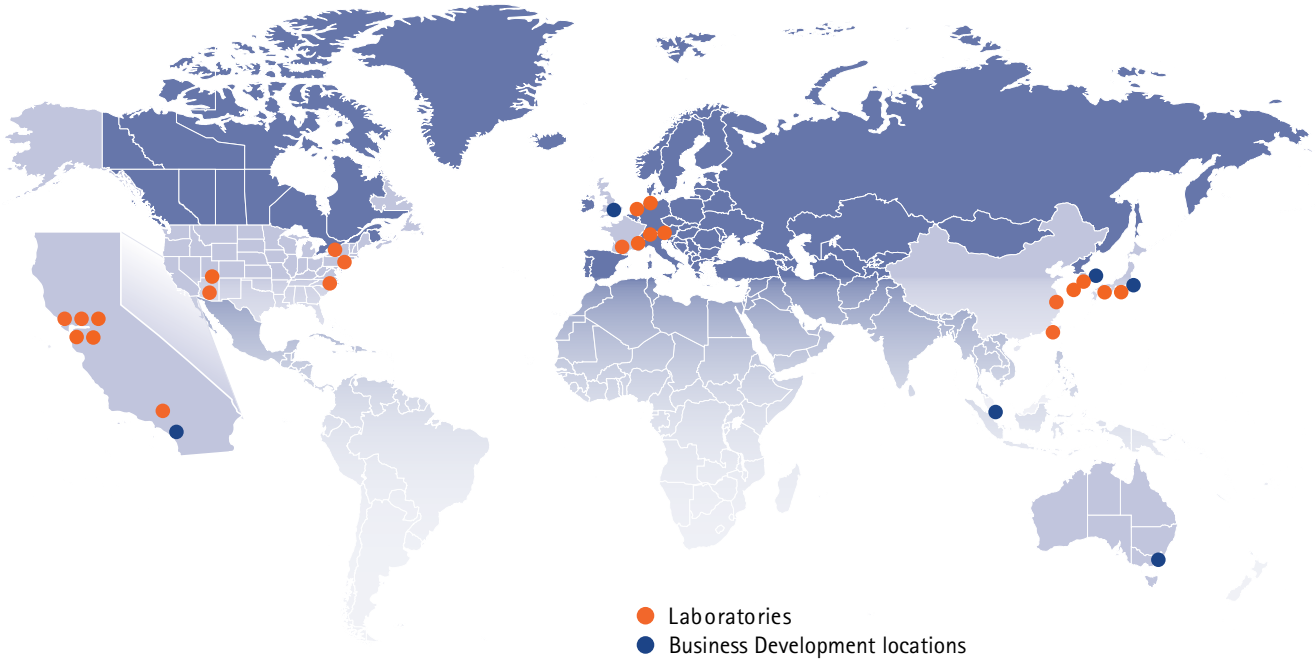

About Eurofins EAG Laboratories

When it comes to understanding the physical structure, performance, identity, chemical properties and composition of materials, no other scientific services company offers the breadth of experience, diversity of analytical techniques or technical ingenuity of Eurofins EAG Laboratories. We don't just perform testing, we drive commercial success—through thoughtfully designed investigations, technically superior analyses, and expert interpretation of data.

We deliver multi-disciplinary, problem-solving expertise to help our customers accelerate innovation, ensure quality and safety, and protect intellectual property. Whether you are seeking to reduce time-to-market, solve manufacturing problems or ensure regulatory compliance, turn to Eurofins EAG. We know how to bring the power of science to every phase of your product lifecycle.

- 20+ facilities located in the US, Europe, and Asia
- 2,500+ instruments
- 1000+ highly-educated employees
- Serving more than 5,000 clients worldwide
- Global presence and customers in more than 50 countries

Complete Lifecycle of Services

- PRODUCT INNOVATION & IMPROVEMENT
- INVESTIGATION & TROUBLESHOOTING
- QUALITY ASSURANCE
- MANUFACTURING SUPPORT
- FAILURE ANALYSIS
- REGULATORY COMPLIANCE
- MANUFACTURING & SUPPLY CHAIN SUPPORT
- CONSULTING & LITIGATION

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