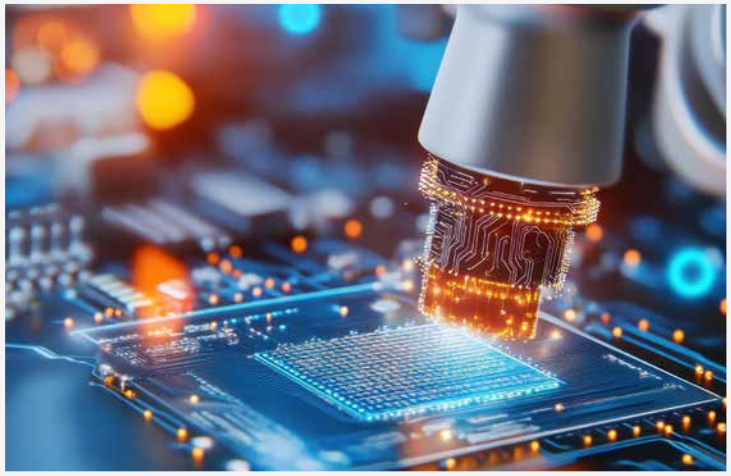
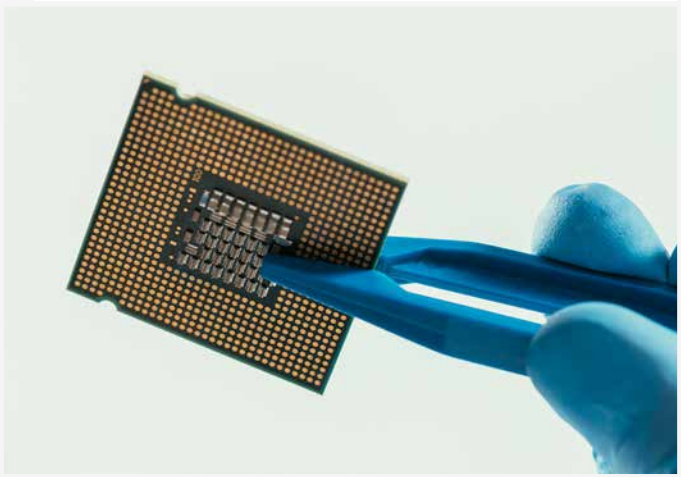
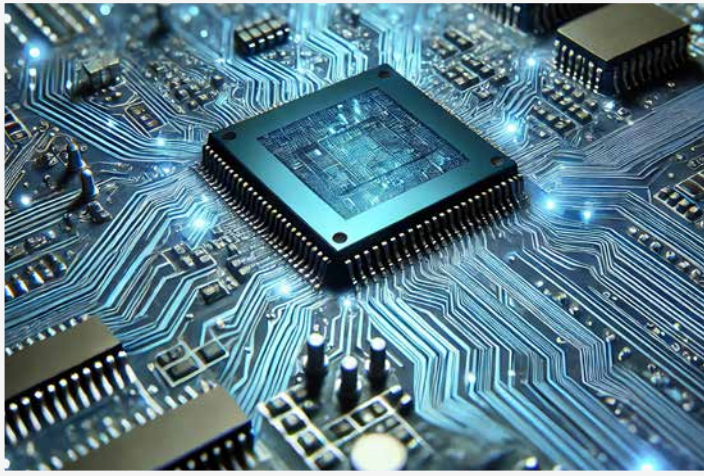

EAG CAN PROVIDE YOU WITH THE RELIABILITY QUALIFICATION DATA YOU NEED

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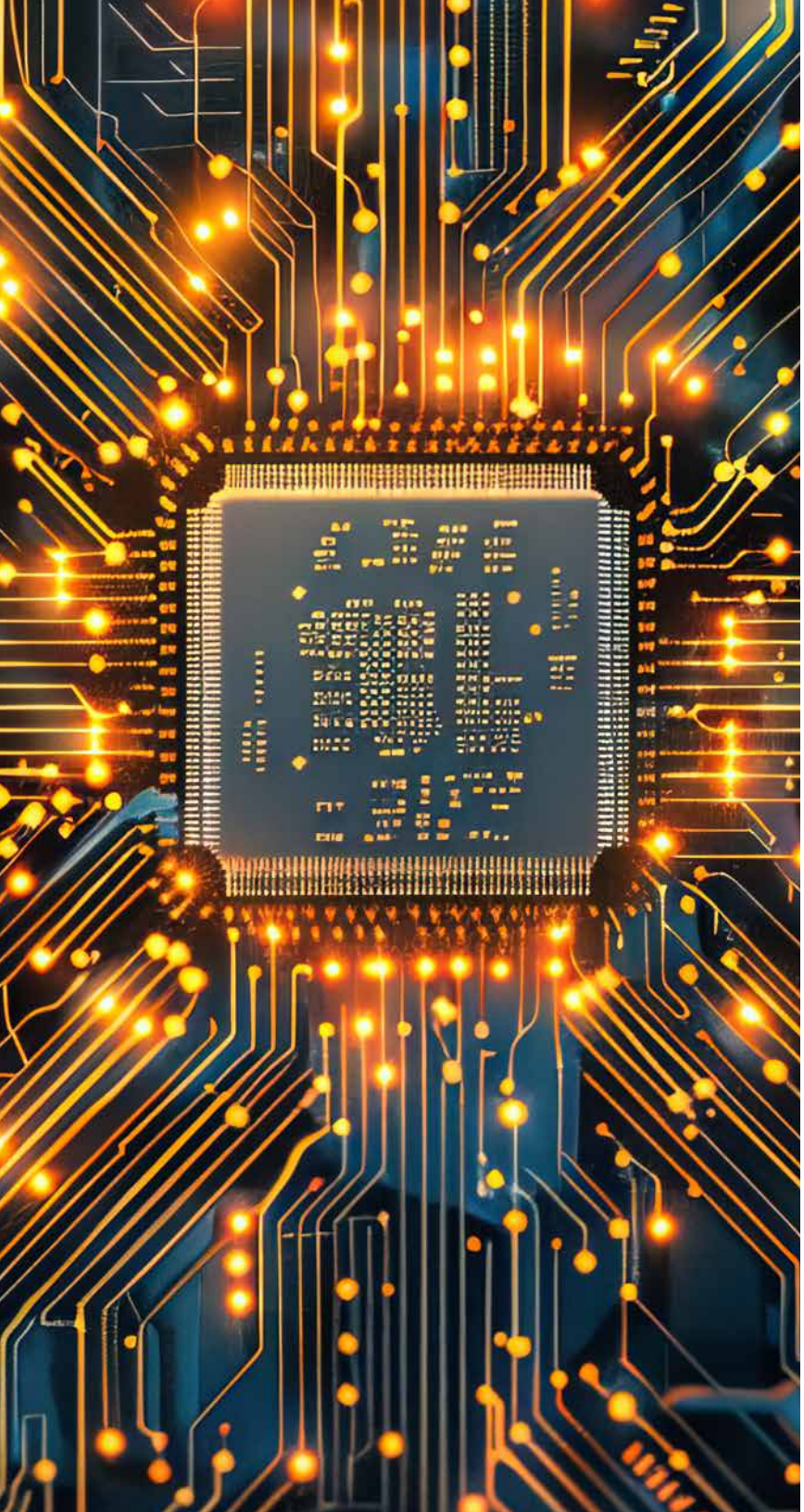
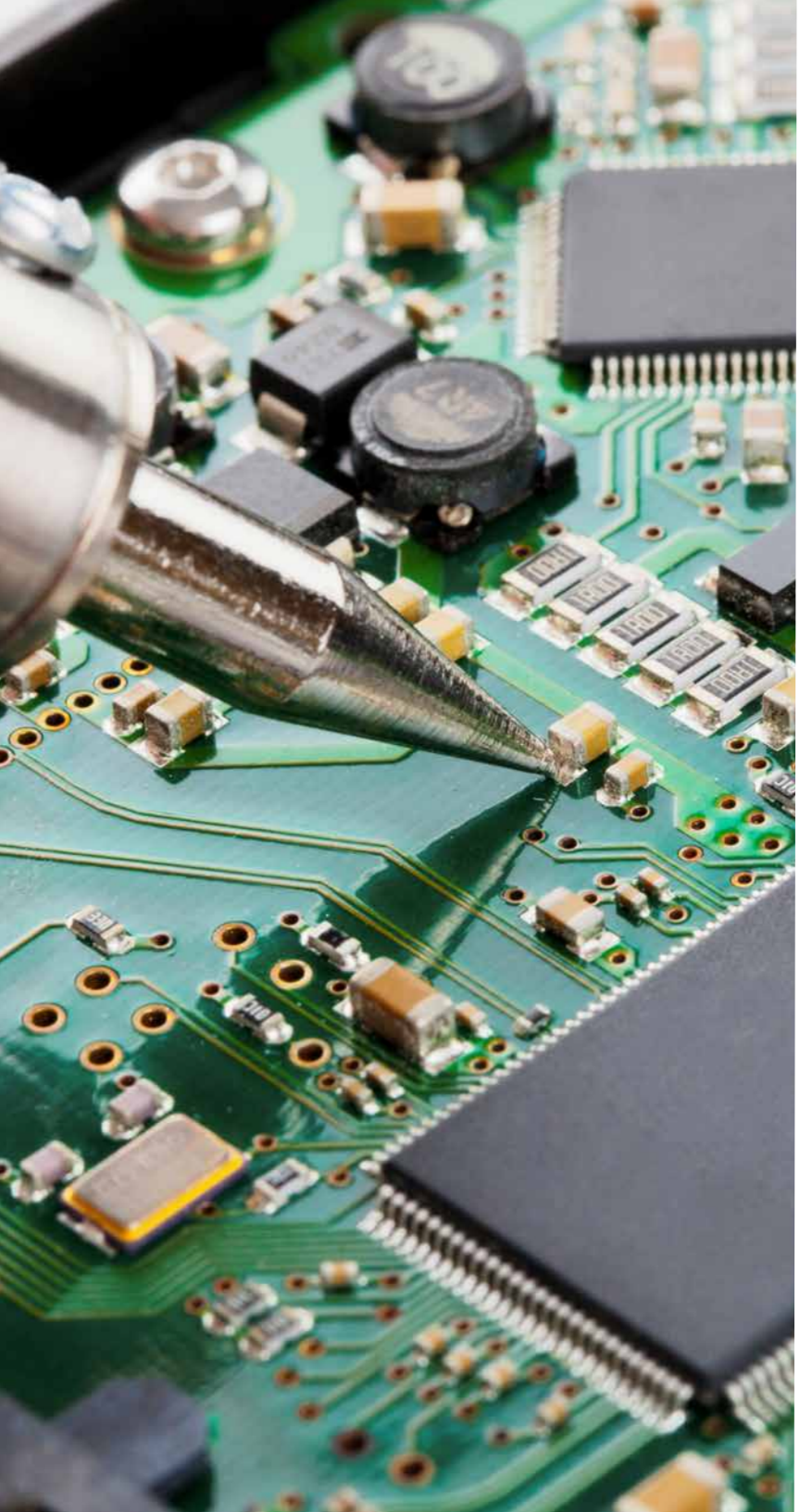


Burn-In and Reliability Qualification at Eurofins EAG Laboratories

Eurofins EAG's world class Burn-In & Reliability Qualification labs have over 130 chambers and ovens in Southern and Northern California. Labs adhere to tight ESD protection controls with routine audits, and a dedicated engineering staff to provide you with burn-in, package qualification, process qualification, and other reliability services that you need. Our lab service procedures are ISO 9001 and ISO 27001 Certified and ISO 17025 accredited and maintain Commercial Laboratory Suitability for the testing of military devices. We follow industry standards, such as JEDEC, Mil STD, AEC, as well as customer specific requirements. All equipment and peripheral measurement devices are N.I.S.T. traceable.

Reliability qualification is an important step in the product development cycle and demonstrates the fitness of a product for use in the field and helps our clients understand the fundamental wear out mechanisms, detect design marginality combined with parameter drift and determine failure rates due to latent manufacturing defects. Whether you need a specific reliability test or complete outsourced services, our experienced Reliability Engineers can create qualification plans and perform testing to meet your requirements.

Our comprehensive suite of services and extensive knowledge ensures that we can lead investigations across a broad array of challenges, delivering robust solutions tailored to your specific needs.



Burn-in & Reliability Qualification Services

Ultra-High Power Burn-In

As the need for large-scale, high-performance computing (HPC) applications continues to rise, integrated circuits are evolving at an unprecedented pace. Eurofins EAG Laboratories assists this evolution by expanding our capabilities to test devices up to 1,000 watts and we have a strategic roadmap to expand these capabilities to include devices up to 2,000 watts.

As a recognized leader in ultra high-power burn-in services, Eurofins EAG Laboratories has a proven track record of delivering comprehensive solutions that drive client success. From designing and managing High Temperature Operational Life (HTOL)/Burn-In (BI) programs for new product qualifications, conducting Early-Life Failure Rate (ELFR) studies, and executing ongoing reliability monitoring, we are equipped to handle the most complex, high-power applications with precision.

Stress Based Testing

Stress-based qualification methodology provides a broad approach to identifying IC failure mechanisms and is a powerful tool to help engineers identify devices that may fail under normal use conditions. Thermal cycling and bias/humidity stress testing are conditions which many products experience, and test conditions are designed to accelerate failures compared to field conditions.

Knowledge Based Testing

Knowledge-based qualification methodology is based upon detecting and understanding specific failure mechanisms. When a failure mechanism is known, accelerated life testing can be designed to detect those failures prior to placing a product in the field.

Eurofins EAG's Testing Methods

Moisture/Reflow Sensitivity Classification

This test is used to determine the classification level of non-hermetic solid state, surface mount devices (SMDs) that are sensitive to moisture-induced stress, so that they can be properly packaged, stored, and handled to avoid damage during assembly, solder reflow attachment, and/or repair operations. EAG utilizes advanced non-destructive inspection methods such as CSAM (C-Mode Scanning Acoustic Microscopy) for the detection of defects like delamination, cracks, and voids without damaging the device. Applicable Specs: J-STD-020, MIL-STD-883 Method 2030.

Preconditioning

Preconditioning is used to provide a standardized method to prepare SMDs for reliability testing by replicating the thermal and moisture stresses they'll encounter in real-world use, up through the soldering process. Preconditioning helps to assess the device's susceptibility to moisture-induced damage and other related failures. Applicable Specs: JESD 22-A113.

HTOL - High Temperature Operating Life Test

High temperature operating life (HTOL) / Burn-In test is to determine the reliability of products by accelerating thermally activated failure mechanisms. Customer parts are subjected to elevated temperatures under elevated biased operating conditions. Typically, dynamic signals are applied to the devices under stress. The test is used to predict long term failure rates. All test samples must pass a final electrical test prior to HTOL testing. Applicable Specs: JESD 22-A108, MIL-STD-883 Method 1005 & 1015, AEC-Q100-008.

HTSL - High Temperature Storage Life Test

The high-temperature storage life test measures device resistance to a high-temperature environment that simulates a storage environment. The stress temperature is typically set to 125°C or 150°C to accelerate the effect of temperature on the test samples. In the test, no voltage bias is applied to the devices. Applicable Specs: JESD 22-A103, MIL-STD-883 Method 1008.

Eurofins EAG's Testing Methods

Temperature Cycling

Temperature cycle testing from temperature extremes accelerates fatigue failures within a specific die and packaging system. Typical failure mechanisms include die cracking, package cracking, wire bond failure, and first or second level interconnect solder fatigue. Applicable Specs: JESD 22-A104, MIL-STD-883 Method 1010.

Thermal Shock

Thermal shock testing is similar to temperature cycle testing, except that in thermal shock tests, additional stress is provided: a sudden change in temperature due to a rapid transfer time. Thus, the test can detect failure mechanisms caused by temperature transients at accelerated temperature gradients. Applicable Specs: JESD 22-A106, MIL-STD-883 Method 1011.

Second Level Interconnect Testing

Air-to-air temperature cycling of customer supplied test vehicles is performed to determine the performance and reliability of 2nd-level solder joints. This type of testing establishes different levels of performance and reliability of the solder attachments of surface mount devices to rigid, flexible, and rigid-flex circuit structures. Applicable Specs: IPC 970, AEC Q104.

Temperature Humidity Bias, Cycled and Steady State

This test is an environmental test designed to assess the reliability of non-hermetic semiconductor devices in humid conditions where condensation is expected. This test applies electrical bias alongside steady state or cyclitic temperature and high humidity to induce surface condensation, allowing for analysis of corrosion and dendritic growth susceptibility. Applicable Specs: JESD 22-A100/JESD 22-A101, MIL-STD-883 TM1004.

HAST - Highly Accelerated Temperature and Humidity Stress Test

To assess the reliability of non-hermetic packaged semiconductors in humid environments, the Highly Accelerated Temperature and Humidity Stress Test is used. This test employs extreme temperature, humidity, and bias to induce rapid moisture penetration, replicating the failure mechanisms observed in the Steady-State Humidity Life Test in a more rapid method. Applicable Specs: JESD 22-A118 (unbiased)/JESD 22-A110 (Biased), MIL-STD-883 Method TM1004.

Eurofins EAG's Testing Methods

Autoclave or Pressure Cooker Test

The Autoclave or pressure cooker test for ICs is an environmental test that measures a sample's resistance to moisture penetration. It is an unbiased highly accelerated test that employs conditions of pressure, humidity and temperature to force moisture into the package. The test conditions are 121°C/100% relative humidity, under pressure, with moisture condensation. Applicable Specs: JESD 22-A102.

Mechanical Tests

EAG conducts a variety of mechanical tests on product packages to evaluate robustness. These tests include physical dimensions, mark permanency, lead integrity, solderability, resistance to soldering heat, die shear, mechanical shock, vibration, variable frequency.

Hermetic Package Testing

EAG performs both fine leak and gross leak testing of packages. Seal integrity testing is crucial for hermetic packages in military, space, and commercial applications. A loss of hermeticity is a reliability concern and will allow moisture and contaminants to enter the package cavity shortening device lifetime. Both Gross Leak and Fine Leak testing are performed per MIL-STD 883.

CSP Reliability Qualification

System miniaturization, especially in consumer electronics market, is driving the development of advanced packaging technologies to accommodate products that are thinner, smaller, and consume less power. This has increased the use of Chip Scale Packages (CSPs). CSP reliability qualification process addresses four key issues: handling, incoming and outgoing quality control (IQC/OQC), socketing, and unbiased stress testing. EAG has developed the solution to these challenges using a combination of specialized processes, carriers and other custom fixtures as an alternative to sockets and daughter cards, and operator training covering all aspects of the qualification process.

Why Choose Eurofins EAG?

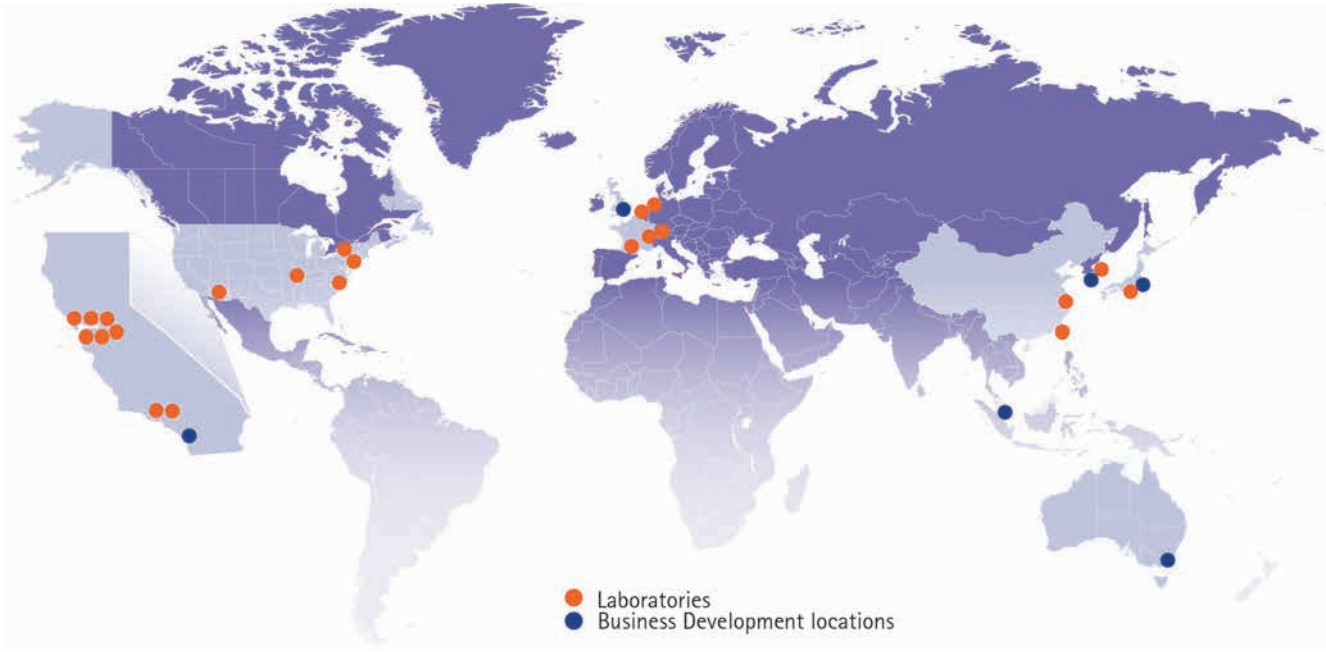
Our burn-in and reliability qualification lab is one of the most advanced in the nation. With more than 130 chambers and ovens, stringent ESD safety protocols, routine audits, and a dedicated engineering team, we provide everything you need for burn-in testing, package qualification, process validation, and reliability data. Recent upgrades to our burn-in equipment have further enhanced our speed and efficiency, saving you significantly in cost of ownership.

What sets us apart is our close collaboration with leading burn-in equipment suppliers across the globe. These trusted partnerships give us access to cutting-edge technology, top-tier support, and continuous advancements worldwide. This ensures that we remain ahead of industry trends and can deliver superior service and innovative solutions to our clients.

Key Benefits of Partnering with Eurofins EAG:

EAG Laboratories offers unmatched testing capacity, handling high-power devices up to 1,000 watts, with plans to reach 2,000 watts by 2026 without compromising speed or accuracy. Our facilities operate 24/7, supported by ATE experts for seamless, uninterrupted read-point testing. We provide end-to-end solutions, from custom burn-in board design to comprehensive qualification management and failure analysis. Security is paramount, with ITAR compliance and industry-best information protection practices. With expertise across automotive, military, aerospace, industrial, medical, and consumer markets, we ensure compliance with stringent industry standards. Our ISO 17025-accredited, DLA Suitable Commercial Lab that tests to JEDEC, MIL-STD, AEC, and client-specific protocols, using N.I.S.T.-traceable tools. Future-ready, we are prepared to meet the evolving demands of high-performance computing and AI applications.

Scan here to learn more about our services and capabilities.



About Eurofins EAG Laboratories

When it comes to understanding the physical structure, performance, 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
- 1,000+ highly-educated employees
- Serving more than 5,000 clients worldwide
- Revenue sourced from more than 50 countries

Complete Lifecycle of Services

- PRODUCT INNOVATION & IMPROVEMENT
- INVESTIGATION & TROUBLESHOOTING
- QUALITY ASSURANCE
- MANUFACTURING SUPPORT
- FAILURE ANALYSIS
- REGULATORY COMPLIANCE
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