

OUR STATE-OF-THE-ART EQUIPMENT AND LABORATORIES

Trusted laboratories – a critical competency for all stages of a product’s lifecycle



Robust, flawless power and signal connectivity continues to become more challenging. Applications continue to become more critical, from automated safety features in transportation to surgical imaging in medical procedures. Application environments continue to become more severe, from high altitude aerospace sensors to underground mining operations. Now more than ever, highly competent environmental test, validation, and analysis laboratories are a critical facet of each stage of a component's lifecycle.



Typically, test and validation are associated with the later stages of a product's development lifecycle. This is only a small piece of the value that laboratories bring. Development engineers need to work closely with the labs early in the design cycle, matching test and validation capability investment to new system and component level design requirements.

Early prototypes that are targeted at fulfilling extremely harsh and challenging quality requirements need to be tested and verified early in the development phase – ensuring customer needs can be fulfilled. The later in the design cycle that the design is fully validated, the more risk (and cost) associated with flawless product execution and delivery. The role of the labs does not stop once a connectivity product is in series production. Should problems arise in the field, the environmental test and validation labs jump into action by working with internal and customer engineers to analyze and diagnose returned products and application issues.

Most importantly, results are immediately available for design engineers, manufacturing engineers, and customer application engineers – addressing design, production, and end-application issues holistically.

COMPREHENSIVE TEST CAPABILITY

TE Connectivity's (TE) laboratories provide a spectrum of services ranging from concept and design verification in the form of tests in parallel with development, to product approval. For system development and new applications, very comprehensive product qualification tests are performed. Failure analyses, customer-specific tests, life-time tests as well as tests on fundamental aspects complete the comprehensive portfolio of services. These services include:

- Environmental-climatical simulation
- Accelerated life and stress testing (HALT/HASS)
- Electrical tests
- Mechanical tests
- Water and dustproofing
- Material and surface finish analyses
- Chemical resistance
- Microscopy and micro sectioning
- Suitability for soldering and resistance to heat during soldering
- Optical communications (plastic optical fiber tests)
- Electromagnetic compatibility (EMC) tests
- Power distributor tests
- RF measurements
- Acoustics

ROBUST ENVIRONMENTAL SIMULATION

Given the ever-increasing harsh environments that connectivity solutions are subjected to, TE Connectivity's laboratories are well-equipped to simulate those environments. Environmental simulation capabilities include:

- Vibration systems with combined climate/temperature and slip table
- Shock test machine
- Climatic chambers
- Temperature shock systems
- Salt fog chamber
- Anechoic chambers
- 4-component mixed flowing gas test unit
- Reflow soldering unit
- Water and dustproofing/IP degree of protection
- Electrical and mechanical test units

STATE-OF-THE-ART SIMULATION AND ANALYSIS CAPABILITY

TE has extensive experimental equipment including measurement and analysis systems. It is the task of the analytics to identify whether the tested parts still comply with the required specifications after they have been subjected to loads. The spectrum of services in this area is broad and ranges from surface and material analysis methods, through non-destructive analysis methods, to weak-point analysis. Here analytics has several functions:

it is a partner during development and a supporting element for the simulation of the environment and is also used for failure and reliability analyses. All of this serves as a cohesive complement to TE's model-based design and digital engineering approach.

- Infrared thermal imaging
- 3D digital microscope/microscopes
- X-ray plating thickness unit
- Analytical scanning electron microscope (SEM, EDX, FIB)
- 3D X-ray computer tomography (CT)
- FT-IR spectroscopy
- 3D confocal surface measuring system
- Audio measuring station
- FFT analyzer



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NORTH AMERICA

Winston-Salem Electrical Components Test Laboratory
Winston-Salem Failure Analysis and Reliability Laboratory
Corporate Fremont Advanced Analytical Lab
Fuquay-Varina High Voltage Test Laboratory
Markham Energy / Utility Products Test Laboratory
Harrisburg Signal Integrity / EMC Test Laboratory
Fuquay-Varina Outside Plant Products Test Laboratory
Winston-Salem Electromechanical Components Test Laboratory
Wilsonville Cable Assemblies Test Laboratory

SOUTH AMERICA

Braganca-Paulista Electrical Components Test Laboratory

EMEA

Bensheim Electrical Components Test Laboratory
Collegno Electrical Components Test Laboratory
Oostkamp Electrical Components Test Laboratory
Pontoise Electrical Components Test Laboratory
Brighton High Voltage Test Laboratory
Gevrey-Chambertin Energy / Utility Products Test Laboratory
Ottobrunn High Voltage Test Laboratory
Swindon Energy / Utility Products Test Laboratory
Witham-Essex Energy / Utility Products Test Laboratory
Tewkesbury Active Interconnect Systems Test Lab
Den Bosch Electrical Components Test Laboratory
Horgen Electromechanical Components Test Laboratory
Barcelona Electrical Components Test Laboratory
Berlin Electromechanical Components Test Laboratory
Evora Electromechanical Components Test Laboratory
Waidhofen Electromechanical Components Test Laboratory

ASIA / PACIFIC

Shanghai Electrical Components Test Laboratory
Kyungsangbuk-Do Electrical Components Test Laboratory
Bangalore Energy / Utility Products Test Laboratory
Shanghai Energy / Utility Products Test Laboratory
Berkeley Vale Electrical Components Test Lab
Shenzhen Electromechanical Components Test Laboratory
Kawasaki Electrical Components Test Laboratory



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A GLOBAL NETWORK, ENSURING 24/7 OPERATION WHEN AND WHERE SERVICES ARE NEEDED

With design centers around the world, all the simulation, modeling, prototyping, and testing can be done close to where our customers are located. This ensures easy access for and collaboration with our customers – helping them address their most challenging connectivity problems. Our global test, validation, and analysis engineers share knowledge and capabilities with each other – ensuring lessons learned globally and not issues repeated.

A TRUSTED AND RELIABLE TEAMMATE TO HELP OUR CUSTOMERS DELIVER SOLUTIONS TO THEIR CUSTOMERS

A teammate is **CAPABLE**. At TE, the quality of our people, products, and processes are second-to-none. We will never stop investing in our capability.

A teammate is **COMMITTED**. TE has a long and rich history of investing in and supporting our customers the way that they want to be supported. We are absolutely committed and can always be counted on

A teammate is **CARING**. We care about our people, our customers, our environment, and our integrity. We never take our reputation and credibility for granted. We are ready to provide sensing and connectivity solutions to any application.

About TE Connectivity

TE Connectivity is a \$12 billion global industrial technology leader creating a safer, sustainable, productive and connected future. Our broad range of connectivity and sensor solutions, proven in the harshest environments, enable advancements in transportation, industrial applications, medical technology, energy, data communications and the home. With approximately 80,000 employees, including more than 7,500 engineers, working alongside customers in approximately 140 countries, TE ensures that EVERY CONNECTION COUNTS. Learn more at www.te.com and on LinkedIn, Facebook, WeChat and Twitter.

te.com

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