CELESTICA ENGINEERING SERVICES: LABORATORIES

Unlock Potential in Your Business

Experience can make all the difference.

In a rapidly changing industry, constant innovation and creativity is key to success for your business.

At Celestica, we imagine, develop and deliver a better future *with* our customers.

Our Engineering Services laboratory team leverages a long heritage of technical leadership to help you:

- Proactively modify your product, component design or manufacturing processes to quantify or increase quality and reliability
- Explain yield challenges
- Quickly understand the root cause for field failures

Our quick turnaround capability provides you with the resources you need to resolve issues that can impact your customers' loyalty to your brand. With failure analysis performed within a manufacturing context, we arm you with the vital information that transforms raw data into decision making.

As a global leader in end-to-end product lifecycle solutions, we also provide you with access to the expertise of our internal design, manufacturing and supply chain teams. Enhancing our ability to unearth your challenges. Solving your issues faster. Enabling your success.

Celestica supports your products through **their entire life cycle.**

THE RESULTS:

1. IMPROVED PRODUCT PERFORMANCE
2. FASTER TIME-TO-MARKET
3. LOWER OVERALL PRODUCT DEVELOPMENT COSTS

Celestica's Laboratory Services can help you:

- Create and execute R&D projects
- Investigate counterfeit components
- Qualify new processes to regulatory and customer needs
- Commission new equipment
- Improve mechanical design robustness
- Quantify and improve product reliability
- Find the root cause of manufacturing quality issues
- Increase production yields
- Improve supplier quality and/or select alternate suppliers

Service availability:

- Expedited turnaround times are available for critical issues
- Expert staff is experienced in and available for international consultation
- Electronic reporting and conferencing
- Complete laboratory project management

Expertise across multiple markets:

Electronic card and product assemblies

- Mobile electronics
- Set top boxes
- Desktop computers
- Basestations
- Consumer products
- Medical electronics
- High-end storage and networking
- Power supplies
- Automotive, aerospace and industrial electronics

Electronic component manufacturers

- BGAs, CSPs
- Connectors, press-fit, LGA or soldered
- Resistors, capacitors, ICs
- Opto-electronics

Printed wiring board assemblies

- 4 to 36 layers, flex, rigid, HDI, microvias
- ENIG, HASL, OSP, IAg, ISn
- FR4 to high speed, BTFE

Industrial electro-mechanical products

- Fans, heat sinks, connectors
- Glass touch screens
- Plastic and metal chassis

R&D and Manufacturing Experience:

- Lead-free soldering, metallurgy and processes
- Qualification of electronic interconnects technologies and processes
- Failure analysis of electronic assemblies
- Thermo mechanical reliability test design, execution and interpretation
- PWB surface finish evaluations
- Counterfeit components
- Optoelectronic component contamination root cause analysis
- Mechanical testing, including shock, vibration, and 4-point bend testing

Personnel Disciplines:

- Analytical chemistry
- Materials sciences
- Metallurgical sciences
- Mechanical engineering and technology
- Electrical engineering and technology
- Reliability engineering

Standards:

- Certified to: ISO 9001, ISO 14001, OHSAS 18001, AS 9100, ANSI ESD and IPC 610
- MIL, IEC, IPC, ASTM and customer standards

Celestica offers you **unequalled expertise.**

Solving your problems through **advanced technical capabilities**

Mechanical Stress - Product Assurance

- Vibration
- Bend and drop tests
- Shock tests
- Strain gauge and pressure analysis
- Test fixture design and build

Reliability Testing - Chamber support

- ATC - thermal cycling chambers with ramp rates of up to 20°C/min
- Continuous resistance monitoring: 4 wire
- Air-to-air thermal shock chambers
- Humidity chambers
- MEOST (multiple environment overstress test chamber)
- Other chambers and ovens

Reliability of Materials

- Interconnect stress test to test reliability of printed wiring boards
- SIR - surface insulation resistance for qualification of chemicals and processes

Reliability Consultation

- Analysis of reliability data – failure distribution models, acceleration models, confidence levels, life data analysis (Weibull)
- Model measured or demonstrated reliability and warranty cost/field return models
- Reliability hardening (robustness) techniques such as MEOST

Materials Science

- SEM with EDX
- Scanning acoustic microscopy (C-SAM) (component delamination)
- X-ray analysis - transmissive 1400x and XRF (X-ray fluorescence)
- Assembly level materials failure analysis

Destructive Materials Analysis

- Cross-sectioning and dye and pry
- Solderability testing and automated wetting balance
- Instron - mechanical strength
- Adhesion, viscosity, flammability

Optical Microscopy with Image Analysis

- Stereoscopes (65x), 360°, metallograph (2000x)
- UV for PWB finish organic contamination
- BGA Scope for inspection of BGA joints

Component Failure Analysis

- Thermal Imaging (IR) camera
- Electrical failure verification and Decapsulation by chemical and reactive Ion etcher
- TDR (time domain reflectometry)

Chemical Analysis

- Ion chromatography and Ionograph for ionic contamination analysis
- FTIR and microscope attachment for organic analysis
- Thermal analysis - materials physical property analysis by DSC, TGA, TMA

For enquiries on these services, please contact:

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