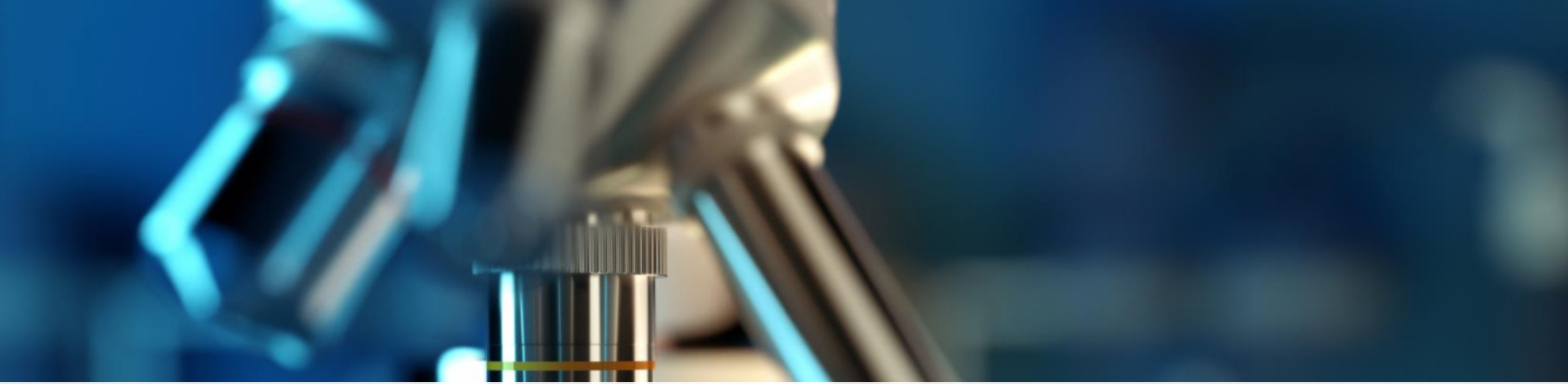


corporate & lab services > ELECTRONIC TECHNOLOGIES

elemca
TESTS ANALYSES EXPERTISE

CORPORATE

> ELEMCA ID | SERVED INDUSTRIES & CUSTOMER PORTFOLIO
> QUALITY | R&D

lab services

> failure analysis | component testing | board qualification
> sample reports | lab tools

corporate | ELEMCA ID

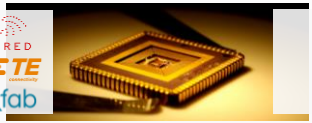
PRIVATE & INDEPENDANT LABORATORY

SAS | founded in 2003 | shareholding: founder + CEO + CTO
2024 : 650 TECHNICAL CAMPAIGNS = 1,8M€ (80%+ industrial customers)

20 EMPLOYEES
> 8 engineers / PhD + 8 technicians / operators
> 4 Sales / Admin / Quality

PREMISES
> ELEMCA Lab (Ramonville)
> CNES-ELEMCA shared Lab (Toulouse)

corporate | CUSTOMER PORTFOLIO – ELECTRONICS

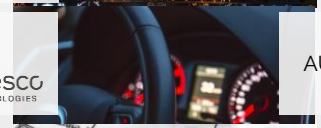


COMPONENTS & MICROELECTRONICS

EMS | ASSEMBLY & INTEGRATION

SPACE
legacy | new space

AERONAUTICS
civil | defense



AUTOMOTIVE | RAILWAY

ENERGY | TELECOM

corporate | CUSTOMER SATISFACTION

> quality management system : compliant w/ ISO 9001:2015

WEB FEEDBACKS

higher rating (**5/5**) granted by **75%** of the respondents on 3 KPI :

> COMMERCIAL RESPONSIVENESS
> TECHNICAL REPORT : USEFUL + RELEVANT
> RESPECTED DEADLINES

TESTIMONIALS

LIEBHERR

Thank you for your **expertise**, I congratulate you.
We have finally **identified the root cause**, and this is thanks to your expertise, your professionalism, and your collaboration.

ACTIA®

Satisfaction is there.
Listening is good, as is the quality of the writing.
The **level of expertise** is evident in the discussions and the reports.

TELEDYNE e2v

Excellent responsiveness, from the commercial proposal to the analysis report.
Very good quality of the analyses, **clarity**, and **quality of the report writing**.

SAFRAN

Thank you again for the **seriousness** and **rigor** you have shown in the successful completion of our tests.
I would like to congratulate you and assure you **that we are delighted to collaborate with you**.

elemca
TESTS ANALYSES EXPERTISE

corporate

> elemca id | served industries & customer portfolio
> quality | r&d

lab services

> FAILURE ANALYSIS | COMPONENT TESTING | BOARD QUALIFICATION
> SAMPLE REPORTS | LAB TOOLS

lab services | KEY ISSUES – ELECTRONICS

YOU ARE

EEE parts engineer | HW design | industrialization | M&P | manufacturing
quality assurance | integrated laboratory | investigations / troubleshooting | purchasing

YOUR GOAL

understand the root cause of a defect
FAILURE ANALYSIS

> evaluate new technologies or assess
COMPONENT TESTING

the compliance of your supplies / products
BOARD QUALIFICATION

elemca is recommended by esa

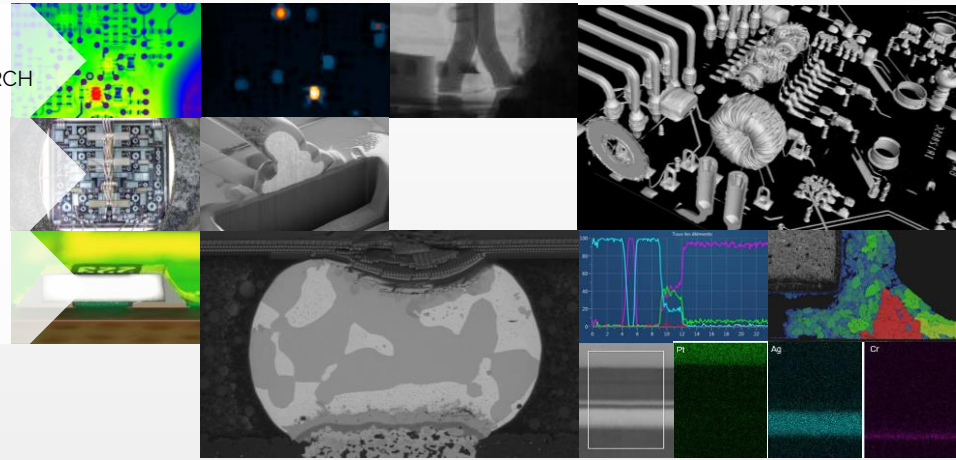
lab services | FAILURE ANALYSIS

> understand the origin of a defect (RCA) – manufacturing, field return…

> NON-DESTRUCTIVE INSPECTION
X-ray 3D & 2D | IR Lock-In Thermography (LIT) | PHEMOS-OBIRCH

> SAMPLE PREPARATION
microsectioning | Ga & plasma FIB | laser | ion X-polisher

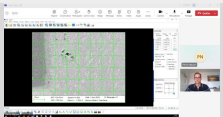
> SURFACE & IN-DEPTH IMAGING
optical microscopy | SEM, STEM, TEM + EDX, EBSD | FT-IR | AFM



AnaDef

EXPERTISE
semiconductor & assemblies

SHORT LEADTIMES
quote 24-48h | final report 1-2 weeks

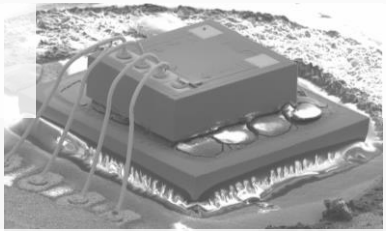


TECHNICAL DIALOG
initial brief | screen-sharing | after-sale service

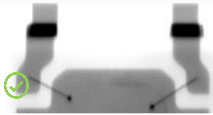
lab services | COMPONENT TESTING

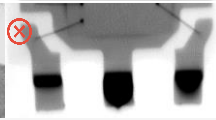
> evaluate emerging technololgies, assess your process quality or the authenticity of your supplies

EVALUATION & RELIABILITY
> DPA, construction analysis ECSS-Q-ST-60-13C
> upscreening (COTS), relifing

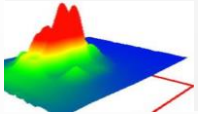


ENTRY & PROCESS CONTROL
> LAT, counterfeit detection
> physical analysis: back-end + front-end

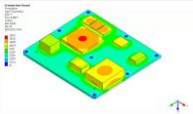




THERMAL & ELECTRICAL MEASUREMENTS > I-V, parametric, Rth
HERMETICITY & BONDING > fine/gross leak, wire pull, die/ball shear



THERMAL CYCLING > [-180°C ; +300°C] vacuum (TVAC) / N2 | 85°, 85%RH
DIGITAL SIMULATION > thermal dissipation | stress & deformations during process



cnes PARTNERSHIP W/ CNES (2003)
> feedback on space components

STANDARDS
ECSS | ESCC | JEDEC | MIL-STD

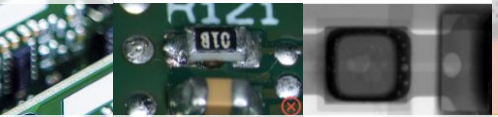
PartLab COMPLEMENTARY ANALYSES
Predictive Image + Tame Component

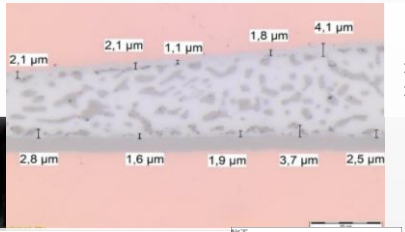
lab services | BOARDS QUALIFICATION

> check the compliance of your boards according to industry standards

PCBA

> IPC-A-610, 9797 | ECSS-Q-ST-70-61C



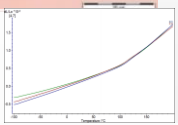


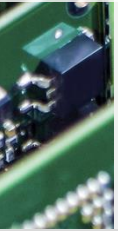
PCB

> IPC-A-600 | ECSS-Q-ST-70-60C
> SIR testing (IPC-TM-650)

MATERIAL PROPERTIES

> Tg, reticulation ratio, CTE, outgassing



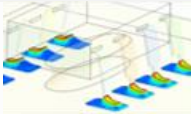


THERMAL CYCLING

> [-180°C ; +300°C] vacuum (TVAC) / N2 | 85°, 85%RH

DIGITAL SIMULATION

> stress & deformations during reflow



CERTIFICATIONS

LAB RECOMMENDED BY esa

COFRAC ACCREDITATION *SOON*

lab services | ANALYSE / EXPERTISE REPORTS

RESULTS + DIAGNOSIS

> measurements & observations
> phenomena interpretation

> FA at a glance (synthesis table)

Défaut électrique	Court-circuit
Défaut physique	Dégradation de la couche d'oxyde avec contact entre 2 couches de métal
Mécanisme probable	EOS lors des tests électriques
Cause possible	Fragilité locale de la couche d'oxyde

AVAILABLE SAMPLE REPORTS :

actual anonymized customer reports

FAILURE ANALYSIS
> PCBA: open via - CTE mismatch
> MOSFET - mechanical overstress
> DCDC converter - CTE mismatch
> Ta capacitor in short-circuit - EOS

ENTRY TESTS - COMPONENTS
> counterfeit detection

PHYSICAL ANALYSIS
> Process control on wedge bonding (FIB + SEM-EDX)

QUALITY CONTROL OF PRINTED CIRCUITS
> Space PCBA (ECSS-Q-ST-70-61C)
> PCBA (IPC-A-610)
> Bare PCB (IPC-A-600)
> SIR testing (IPC 650)

MATERIALS TESTING
> Outgassing measurements - TML CVCM (ECSS-Q-ST-70-02)

lab services | TOOL-BOX

> CNES-ELEMCA shared Lab (Toulouse, 31 FR) + ELEMCA Lab (Ramonville, 31 FR)

NON DESTRUCTIVE INSPECTION

> X-ray **Computed Tomography** (3D)
> X-ray radiography (2D)
> IR **Lock-In Thermography** (LIT)
> PHEMOS/OBIRCH
> acoustic microscopy* (CSAM)

PHYSICAL ANALYSES

sample preparation
> microsectionning
> **FIB Ga**, **plasma FIB** (Xe)
> laser | ionic cross-polisher
imaging & chemical charac.
> optical microscopy
> electron microscopy :
SEM-EDX, **SEM-EBSD**, TEM*
> AFM | XRF | FT-IR

THERMAL & CLIMATIC TESTING

> thermal cycling
[-180°C; +300°C] under N2 flow
> **thermal vacuum**
-180°C, 10^{-5}mbar
> thermal shocks
[-80°C ; +220°C] double cabinets
> climatic
+ 85°C, 85%RH

+ power supply [DC-1GHz]

THERMAL & MECH. CHARACTERIZATION

> **thermal analyses**
[-150°C ; +500°C]
TMA | DMA | DSC | ATG
> Universal testing (tensile, shear, bending) [-80°C ; + 250°C]
> outgassing (TML CVCM)
> nanoindentation

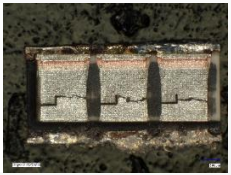
key equipments
new (2024-2025)
* sub-contracted services (partners)

lab services | NEW EQUIPMENTS 2024-2025

focus > advanced techniques for sample preparation

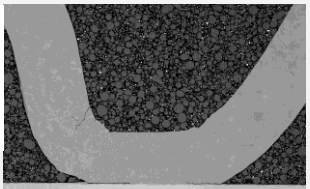
LASER DECAP

> IR 1034nm = package removal (ceramic, plastic molding)
> UV 350nm
focused: fast PCBA microsectionning, package removal (metal, glass)
defocused (ecoblue): finishing for Top access to IC (bondings preserved: Cu, Al, Au, Ag...)
> CO2 10600nm = gel removal (Silicone etc.), glass cutting

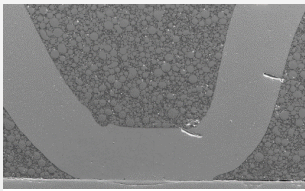


ION POLISHER (X-POLISHER)

> microsectionning (max L10mm x D 5mm) - precision 5-10µm
excellent surface finish + revelation of the microstructure
cracks/defects not altered (at core + interface): no smearing of the material
> parallel polishing (flat milling)



ionic microsection



conventionnal microsection

lab services | YOUR CONNECTED LAB

> 100% free digital features

SEM LIVE SCREEN SHARE

🎯 Need for **Realtime** collaboration with our experts?
💻 Secured Teams **conference call**
→ Share of the SEM microscope screed (video) + online discussion with our expert (audio)

You can follow our observations in real time and copilot the investigations

🔬 available for 100% of Electronic Microscopy imaging techniques (SEM, STEM, TEM)

FAST ACCESS TO YOUR RESULTS

🎯 Need for **instant access** to your analysis **results**?
💾 We setup your secured and shared webfolder
→ All files are instantaneously shared with you

Your results are available in real time, for each investigation step

🔬 available on request

VOTRE CONTACT

A WHOLE TEAM AT YOUR SERVICE | RESPONSIVENESS & EXPERTISE

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