

Localisation de défauts par μ -tomographie X
sur cartes & composants électroniques



Journée technique Tomographie
14/05/2019

Clovis Lataste, Responsable commercial
06 69 46 31 01
clovis.lataste@elemca.com

Laboratoire privé & indépendant : prestations de **tests, analyses & expertise**



Technologies **électroniques**

Matériaux & Fabrication Additive





Esterline

LATECOERE
LIEBHERR

MEGGITT SAFRAN STELIA



ACTIA



sodern
anarogroup

cnes
CENTRE NATIONAL D'ÉTUDES SPATIALES



AIRBUS
DEFENCE & SPACE

ThalesAlenia
Space
a Thales / Leonardo company

eesa



3D SYSTEMS

AMPLEON

aria
electronique



ALSTOM



Air Liquide
creative oxygen

Schlumberger

FUSIA
FUSION JET-VC

rakon



SOFRADIR
Sensing your future

TELEDYNE
TECHNOLOGIES
Everywhere you look

STEEL
INDUSTRIAL



RENAULT
Passion for life



BOSCH

Continental

Valeo



tronics
microsystems

EREMS

lisi
AEROSPACE

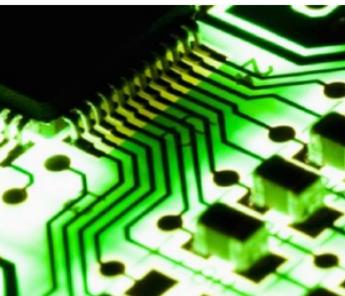
OPTALM
Advanced Manufacturing Solutions

POLY-SHAPE
add. 3d manufacturing

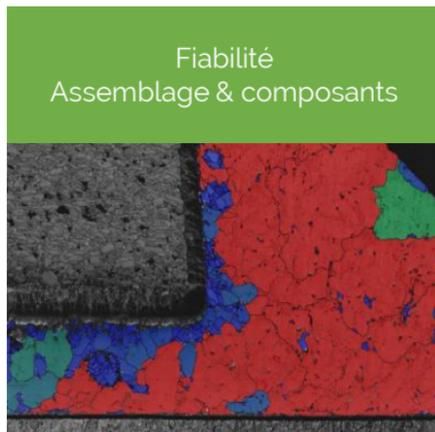
VOLUM-e
3D Complex Production



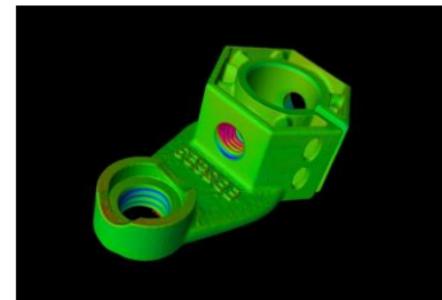
Support R&D



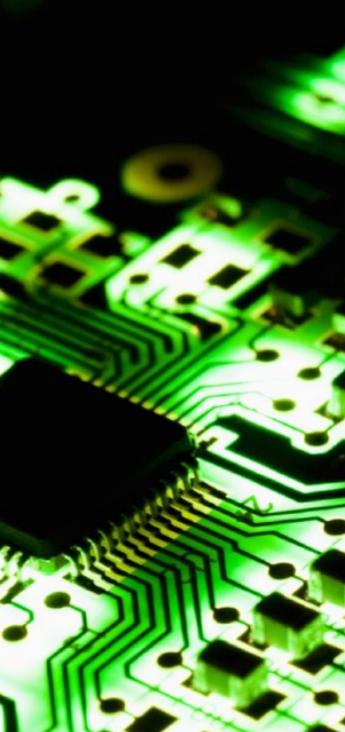
Qualification &
validation



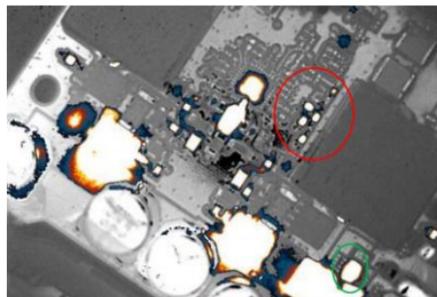
Essais thermiques,
climatiques, vide



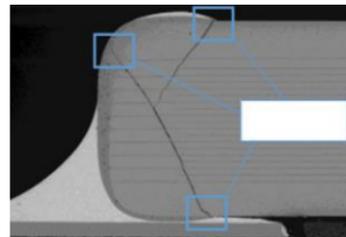
Conformité :
Santé-Matière, dimensionnel



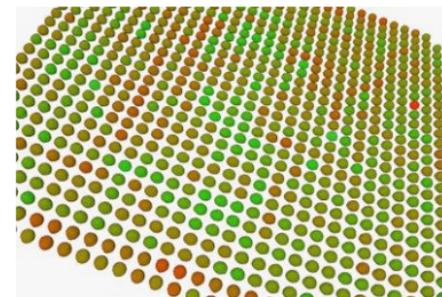
Analyse de
défaillance



Thermographie IR dynamique
(LIT)

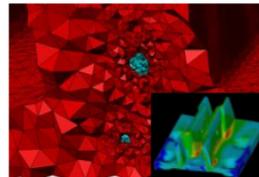
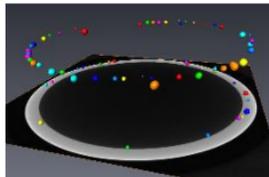
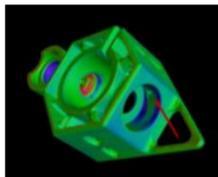
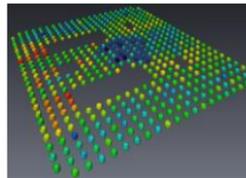
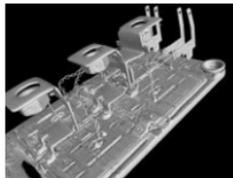


Analyses physiques



μtomographie X

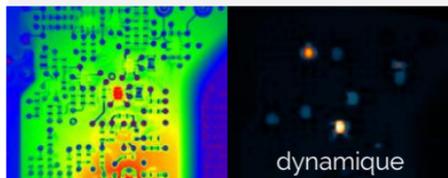
μTomographie X



Équipement **GE v|tome|x s**
 2 canons X-ray
 180kV (15W) / **240kV (320W)**
 réso = **taille zone scannée x (1/1000)**
 XYZ ≤ 250mm x L450mm
 Épaisseur MAX matériau dense : **20mm**

CND / Localisation de défauts

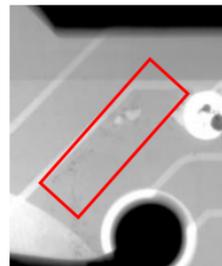
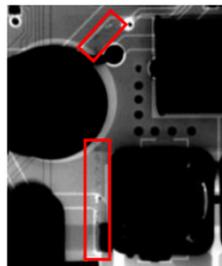
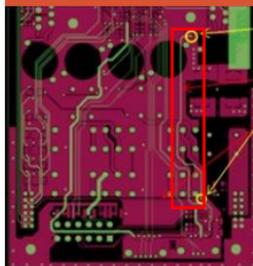
Thermographie IR synchrone (LIT)



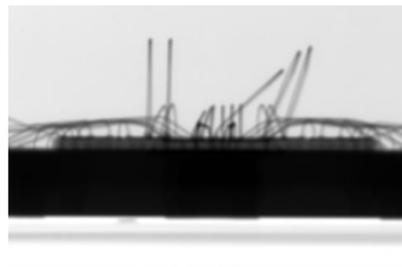
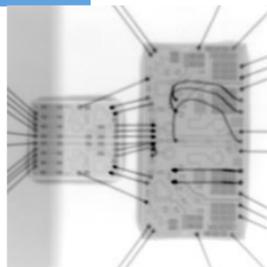
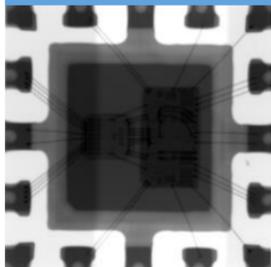
dynamique

Équipement **DCG ELITE**
 Résolution < **3μm à 10X**
 Sensibilité : **défaut < 1 μW**
 Zone inspectée ≤ 200x160mm
 Mode mesure T° +/- 3°C

Piste détruite



Intégrité câblage



RX2D

PCBA / composant



R&D

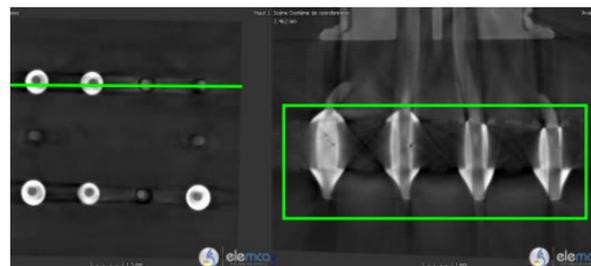


Qualif



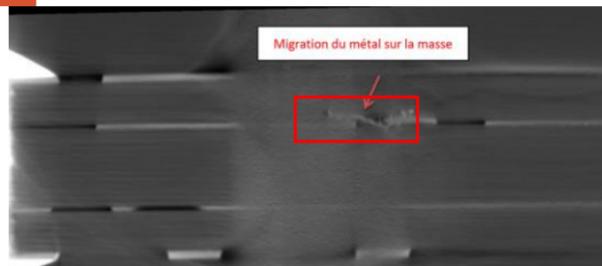
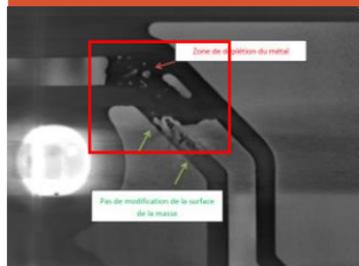
Avarie

Conformité / IPC-A-610



120kV x 160µA
20µm
1200 x 800ms
4X

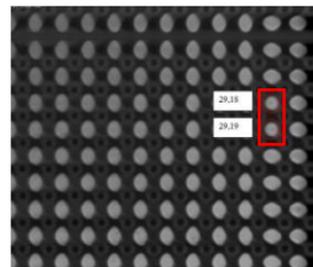
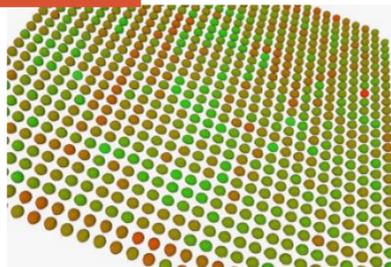
CC piste / plan de masse



110kV x 130µA
8µm
1300 RX 2D x
1000ms
Sensibilité 1x

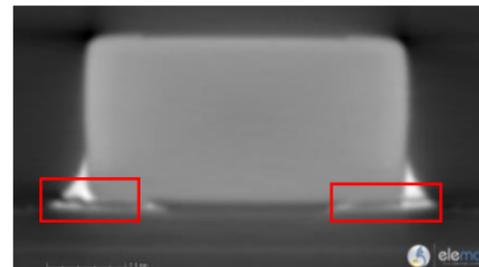
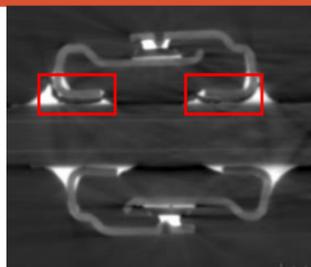
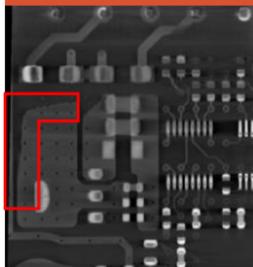
µTomographie X
PCBA

Défaut d'assemblage



180kV x 140μA
32μm
1500 x 1000ms
4X

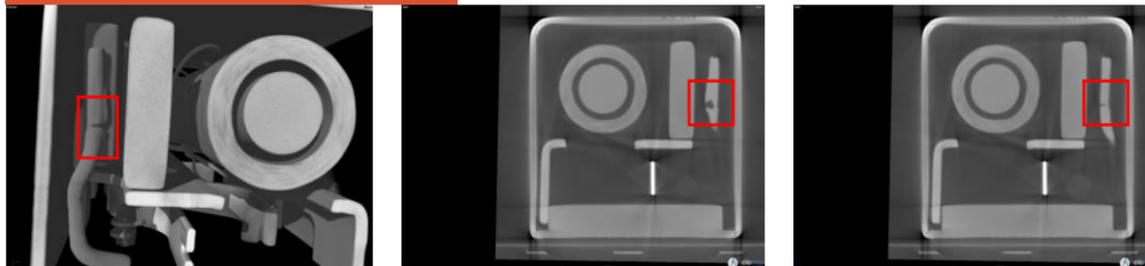
Jointes brasés fissurés + plan de masse gondolé



170kV x 180μA
29μm
1300 x 800ms
1X

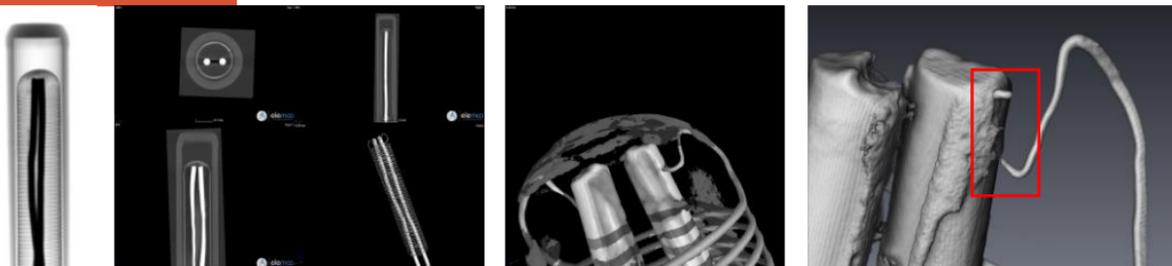
μTomographie X
PCBA

Broche fissurée



160kV x 170 μ A
28 μ m
1200 x 800ms
1x

Rupture spire



160kV x 90 μ A
6 μ m
1100 x 1000ms
Vsensor
2x

μ Tomographie X
Composants

Point chaud anormal



Diminution R_{bobinage}



Thermo IR
synchrone / LIT

Questions?