

Computed Tomography (CT)

SEM Analysis

Ionic Chromatography

Rose Test

Warpage Testing

X - Ray

Optical Microscopy

Lab services

for the electronic industry

NUFESA Labs.
smart testing


ABOUT NUFESA LABS



Nufesa Labs was created with the idea to service the Electronics market with dedicated electronics specialists in a state of the art laboratory. Our focus on this market allows us to be market leaders when it comes to knowledge and experience with testing PCBs, PCBA's, components, modules, and other apparatus associated with electronics.

Our installations are equipped with latest generation equipments including SEM, X-Ray, XRF, Cross Sections, C3, Ionic Chromatography, Computed Tomography (CT), ROSE Testing, FTIR, Thermal Warpage, Digital and Optical Microscopy amongst others.

We are IPC certified and also have ISO 9001:2015 and ISO 17025 (May 2022) Certifications

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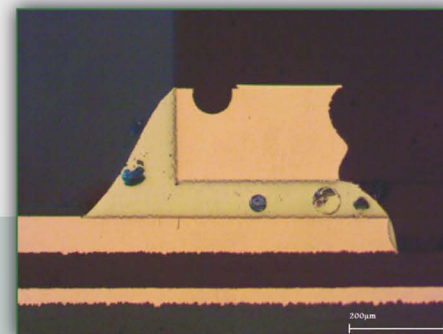
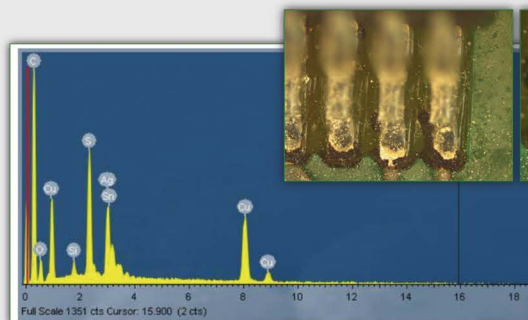
Compositional Analysis Testing

Compositional analysis allows us to identify and characterize materials to verify the quality of materials in a **PCB** or **PCBA**. We can use a variety of techniques to test for quality issues and identify the causes when there are problems with material. Samples are typically extracted and then submitted to various screening processes. We are able to identify organic and inorganic metals and compounds.

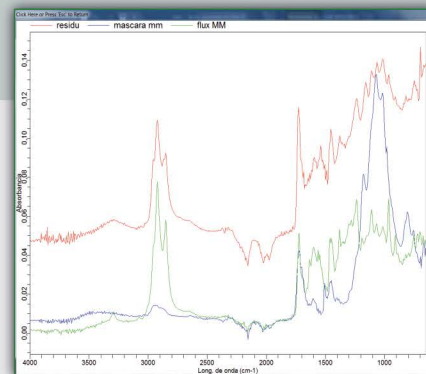
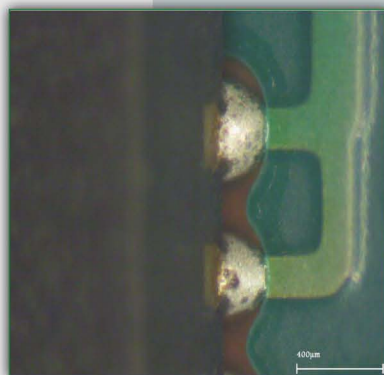
Testing methods include:

EDX
XRF
FTIR
SPARK

CHEMICAL COMPOSITION ANALYSIS OF METAL FINISHES (EDX)

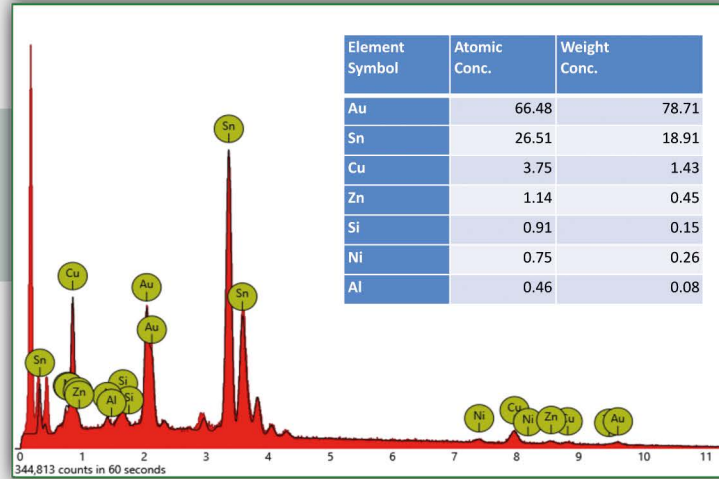
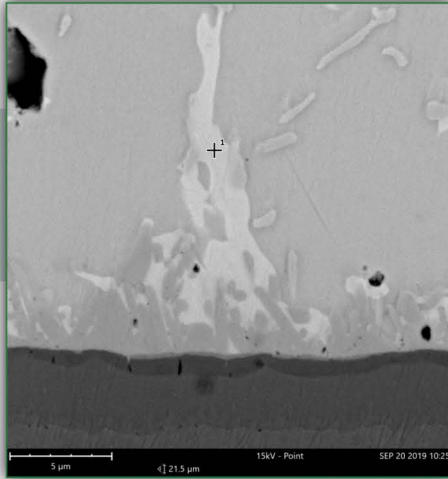


Determination of chemical elements in the sample
Elemental mapping
Interface Analysis



**CHEMICAL
COMPOSITION
ANALYSIS
IN CONTAMINATION
(FTIR)**

CHEMICAL COMPOSITION ANALYSIS OF METAL FINISHES (EDX)



Low SAC componentes	Muestra analizada	Limites	OK
Sn	bal	98.5 - 99.5	✓
Ag	0.2037	0.2 - 0.4	✓
Cu	0.745	0.6 - 0.8	✓

Low SAC impurezas	Muestra analizada	Limite Max	OK
Pb	0.022	< 0.07	✓
Sb	0.003	< 0.20	✓
Zn	0.0004	< 0.003	✓
Fe	<0.0001	< 0.02	✓
Ni	0.0136	< 0.01	✗
Bi	0.033	< 0.10	✓
Cd	0.0002	< 0.002	✓
Au	0.0012	< 0.05	✓
As	0.0042	< 0.03	✓
Al	0.0006	< 0.005	✓
In	0.0014	< 0.10	✓



Quantitative percentage analysis
Process contamination from the solder bath

SOLDER BATH COMPOSITION ANALYSIS (SPARK)

Ionic Testing

Ionic testing allows us to test the residues on a PCB either before the assembly process or after assembly to determine the amount and quality of residue or contaminants which are present.

These residues can be by products of solder flux or other contaminants which can negatively affect the performance of the PCBA.

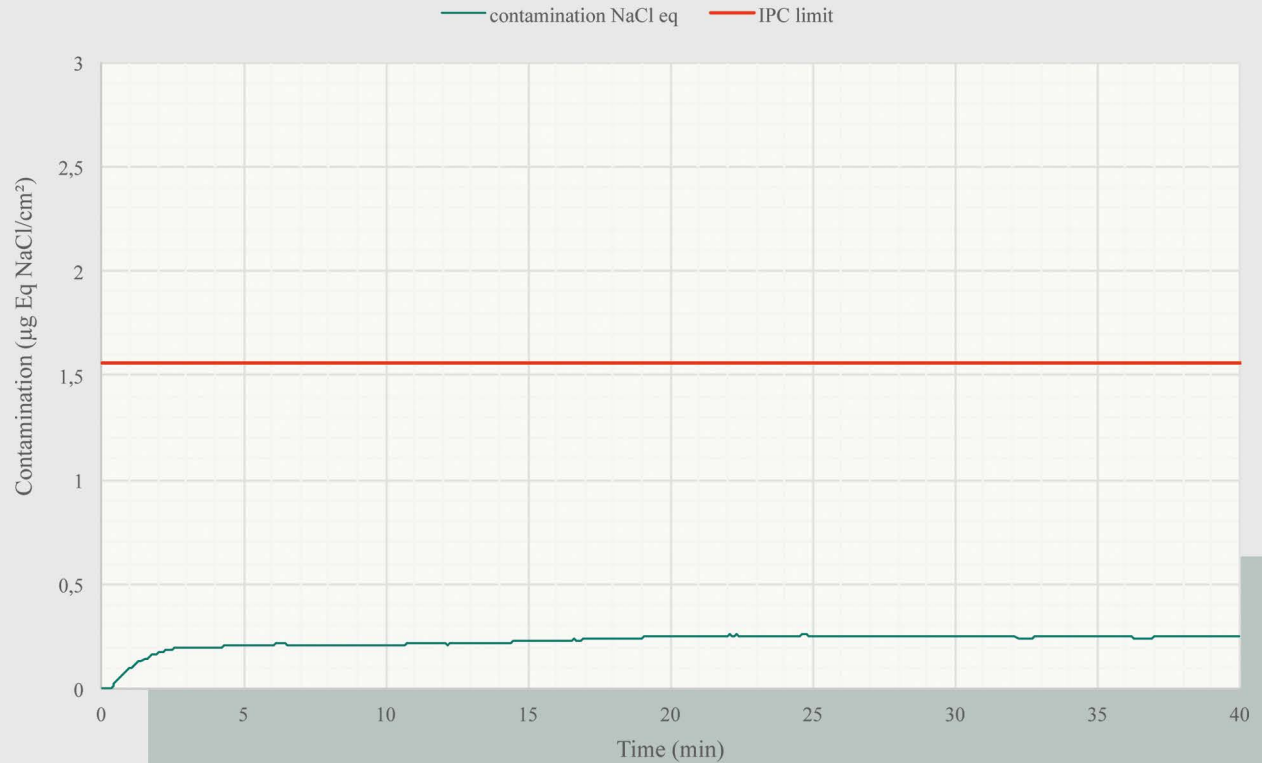
ROSE TEST

C3 (Localised Rose Test)

IONIC CHROMATOGRAPHY

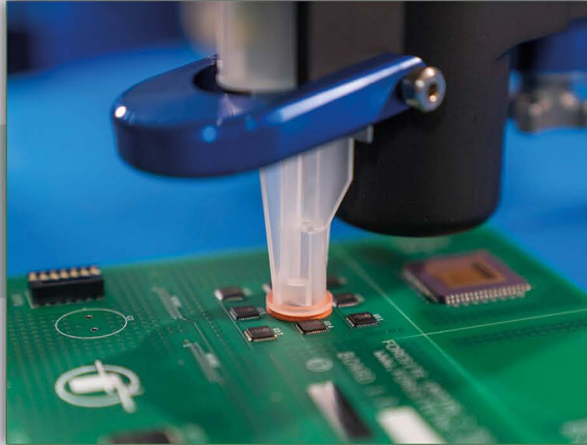
SIR (Surface Insulation Resistance Test)

R.O.S.E Test on a Board

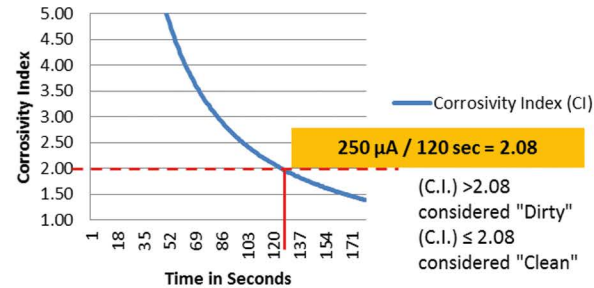


- Test method IPC-TM-650 2.3.25 (revision D).
 - Recipe: ST7525
 - Fluid type: IPA 75% / DI-H₂O 25% v-v
 - Fluid temperature: 25 °C.
 - Duration: 180 min

ROSE TESTING

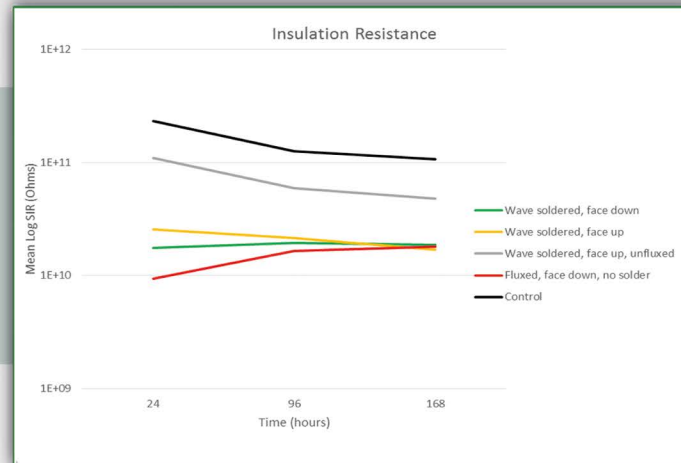
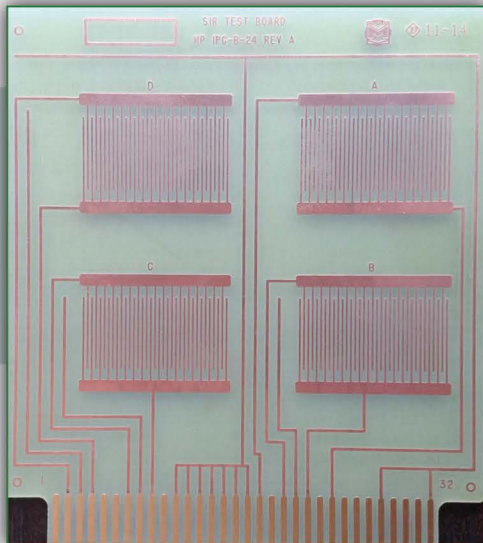


Corrosivity Index Result of the C3® (250 μ A with 10 VDC on a 50 mil Space Electrode) Current / Time = Corrosivity Index (C.I.)



C3 (Localised RoseTest)

Critical Cleanliness Control

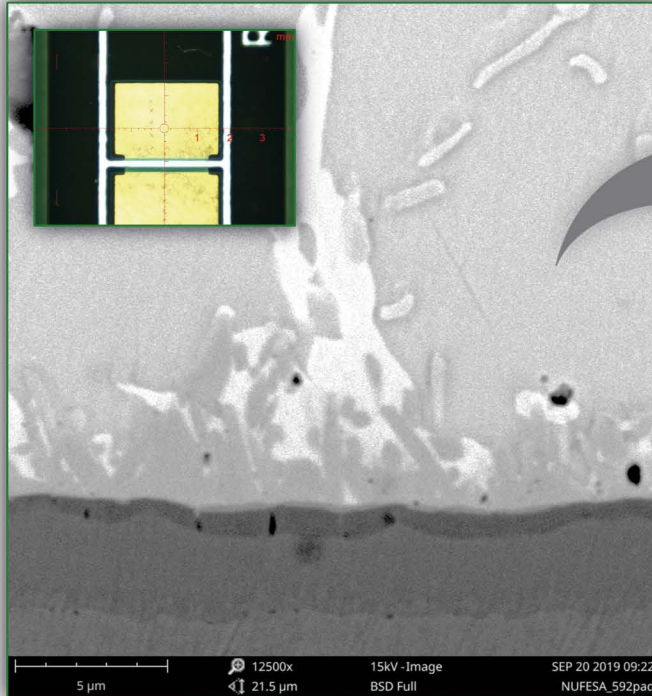


SIR (Surface Insulation Resistance Test)

Coating, Plating and Thickness Testing

It is important to ensure that the coating and plating thickness and quality are up to standard and within the defined specifications in the electronics industry. We are able to test not only the coating and plating thickness, but also copper thickness as well as any dielectrics such as fibres, masks, etc. There are various ways to check these parameters, both destructive and non destructive.

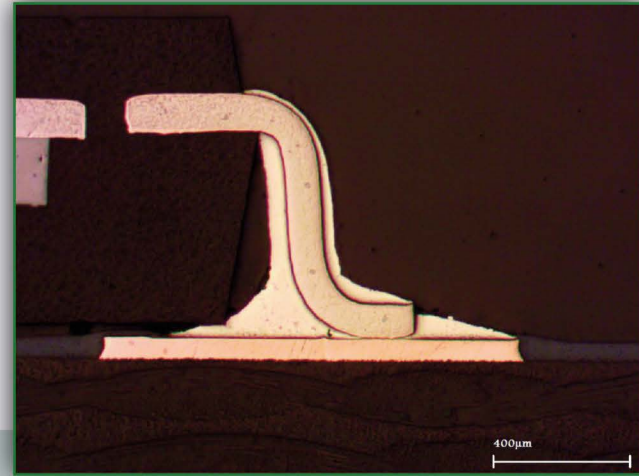
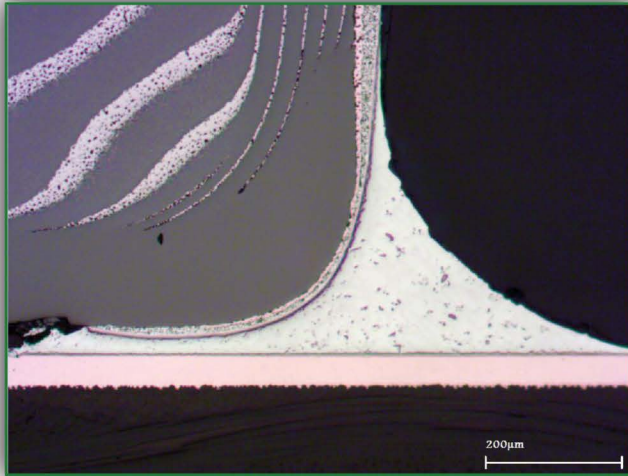
Testing methods include:
XRF (non-destructive, but not suitable for all cases)
Micro-sectioning / Optical Microscopy (destructive)



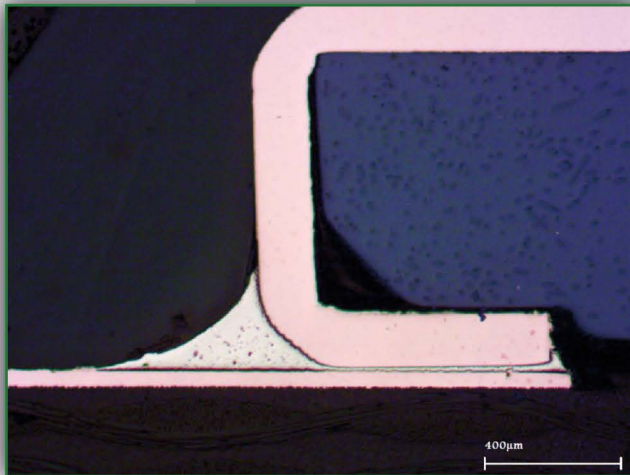
Directory : PCB
Product : 793 / Au
Application : 793 / Au
Date : 28/02/2019

Calibr. Std. Set
Time: 11:00:13

n=	1	Au	1 =	0.035 µm
n=	2	Au	1 =	0.039 µm
n=	3	Au	1 =	0.029 µm
n=	4	Au	1 =	0.040 µm
n=	5	Au	1 =	0.034 µm
n=	6	Au	1 =	0.040 µm
n=	7	Au	1 =	0.036 µm
n=	8	Au	1 =	0.028 µm
n=	9	Au	1 =	0.043 µm
n=	10	Au	1 =	0.040 µm
n=	11	Au	1 =	0.042 µm
n=	12	Au	1 =	0.040 µm
n=	13	Au	1 =	0.047 µm
n=	14	Au	1 =	0.046 µm
n=	15	Au	1 =	0.037 µm
n=	16	Au	1 =	0.044 µm
n=	17	Au	1 =	0.041 µm
n=	18	Au	1 =	0.038 µm
n=	19	Au	1 =	0.042 µm
n=	20	Au	1 =	0.035 µm



MICRO-SECTIONING



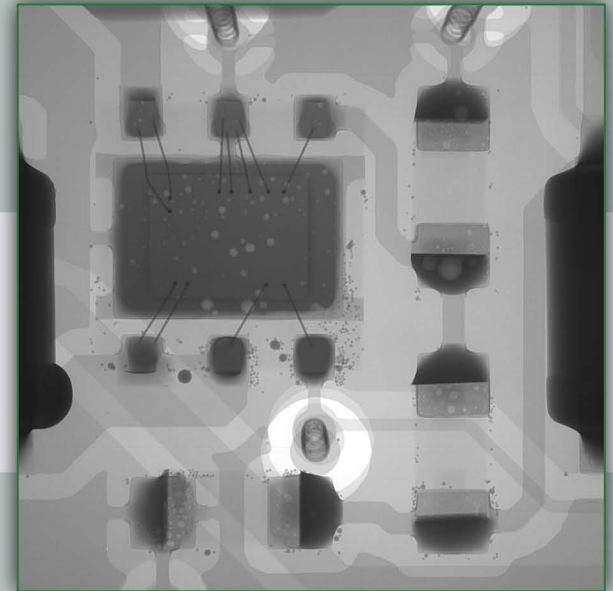
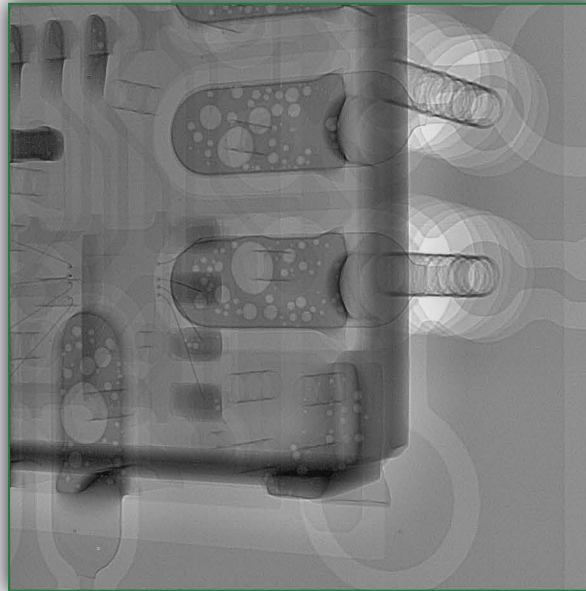
Counterfeit Components Detection

In today's market there are fake or damaged components that are in circulation.

To detect genuine components we are able to use both non-destructive or destructive processes to analyse the authenticity of your components.

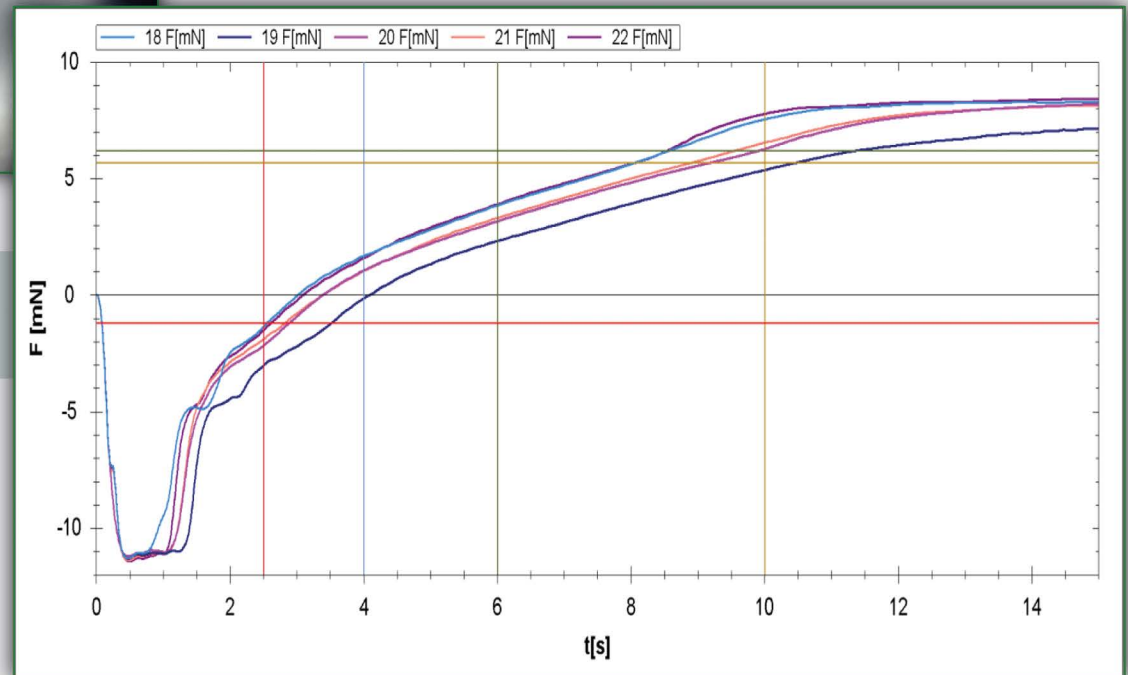
Testing methods include:

- X-Ray**
- Electrical testing**
- KFT testing**
- Decapsulation**
- Soldering Testing**
- XRF**





Example of Solderability Testing

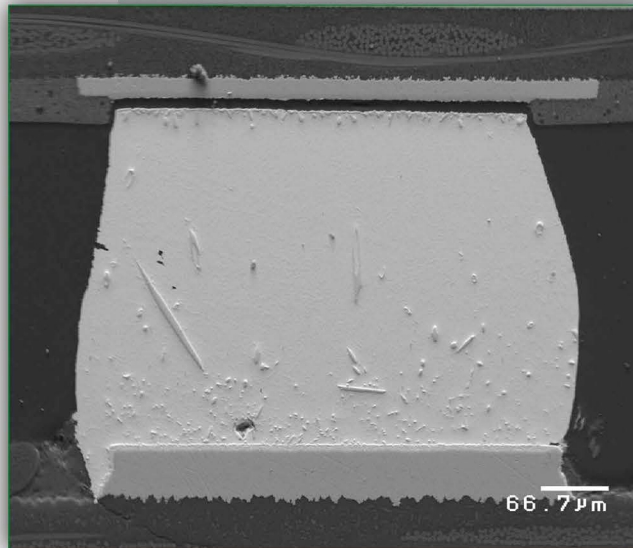


Electronics Failure Analysis

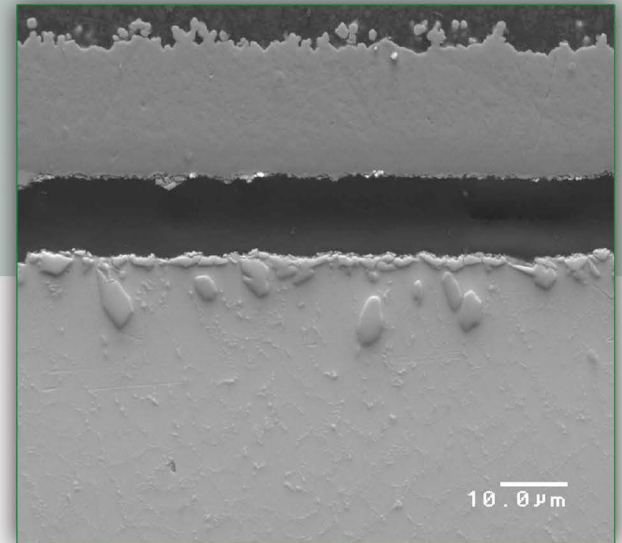
This area of service involves finding defects in PCBAs when you are unable to identify the root cause.

We can analyse the entire assembly to verify where the issues can be arising through a variety of different methods, using a combination of visual methods (optical microscopy), identification systems (ROSE, IC) or even SEM/EDX.

We are available to provide detailed case studies to identify critical areas including defects and areas with non-defects that could lead to problems in the future to identify areas needing improvement.



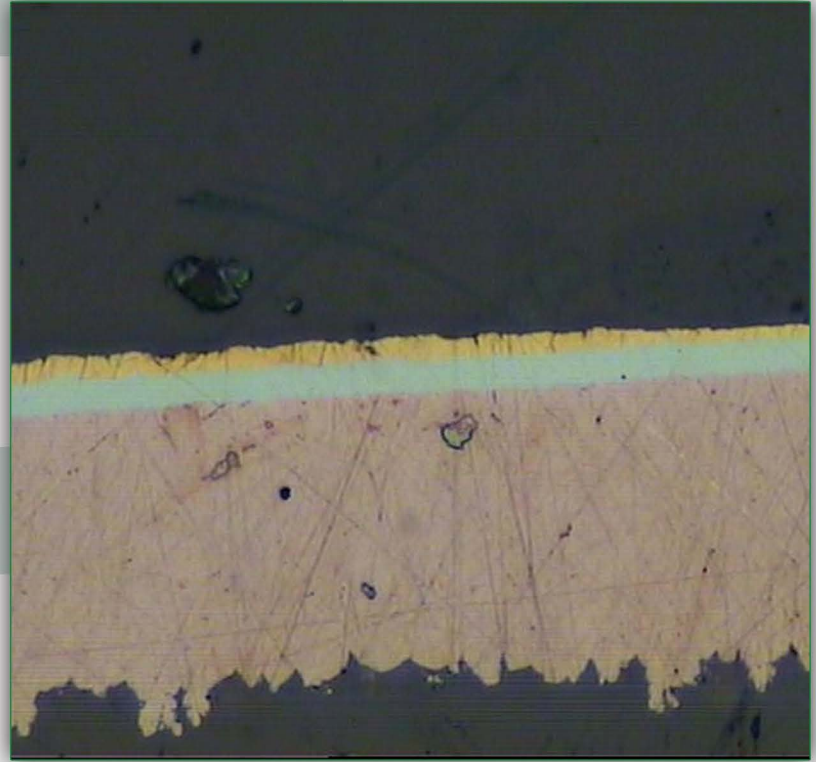
Example of "Black Pad"



Close up of "Black Pad"



Dendritic Growth



Example of Thick Gold layer on ENIG finish

Thermal Warpage and Strain Metrology

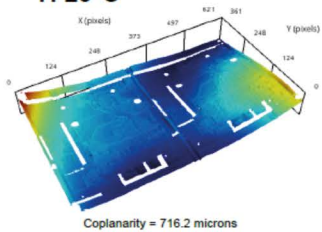
Shadow Moiré allows for the measurement of warpage (out of plane displacement) on smooth, continuous surfaces over temperature. Measurements are fast, full-field, and accurate down to sub-micron resolution, depending on application.

Digital Image Correlation (DIC) is the only technique that can perform in-plane measurements. DIC uses pattern matching of speckle patterns applied to the sample surface to provide x-y strain and CTE data over temperature.

Digital Fringe Projection (DFP) is capable of measuring discontinuous surfaces with high data density. The surfaces can have large variations in step heights.

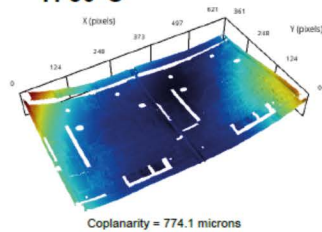


T: 25°C



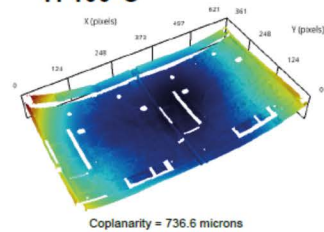
Coplanarity = 716.2 microns

T: 50°C



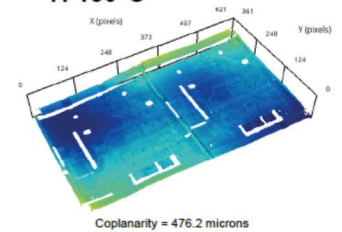
Coplanarity = 774.1 microns

T: 100°C



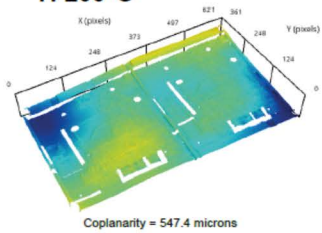
Coplanarity = 736.6 microns

T: 150°C



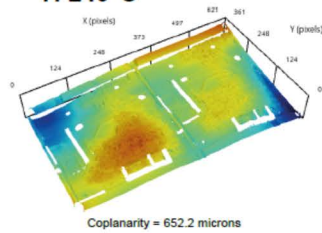
Coplanarity = 476.2 microns

T: 200°C



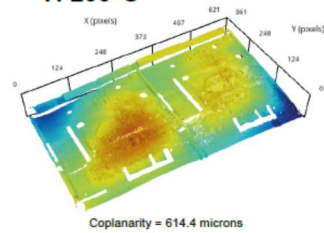
Coplanarity = 547.4 microns

T: 240°C



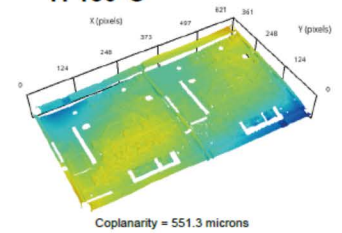
Coplanarity = 652.2 microns

T: 200°C



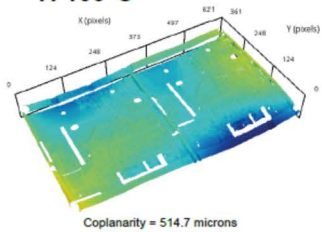
Coplanarity = 614.4 microns

T: 150°C



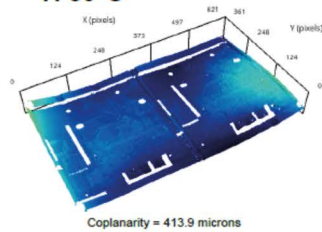
Coplanarity = 551.3 microns

T: 100°C



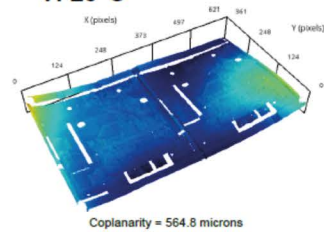
Coplanarity = 514.7 microns

T: 50°C



Coplanarity = 413.9 microns

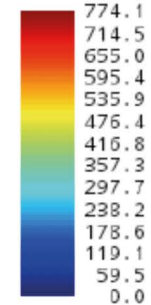
T: 25°C



Coplanarity = 564.8 microns

Results produced using the TherMoiré® Warpage Measurement System 2019-11-01

microns

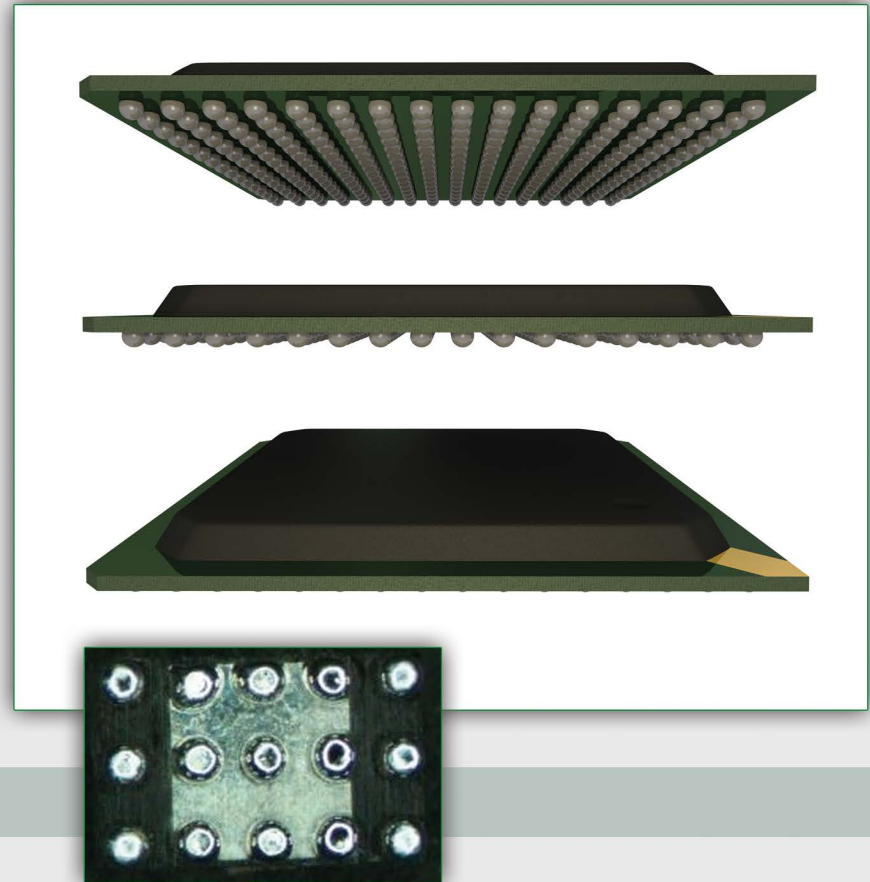


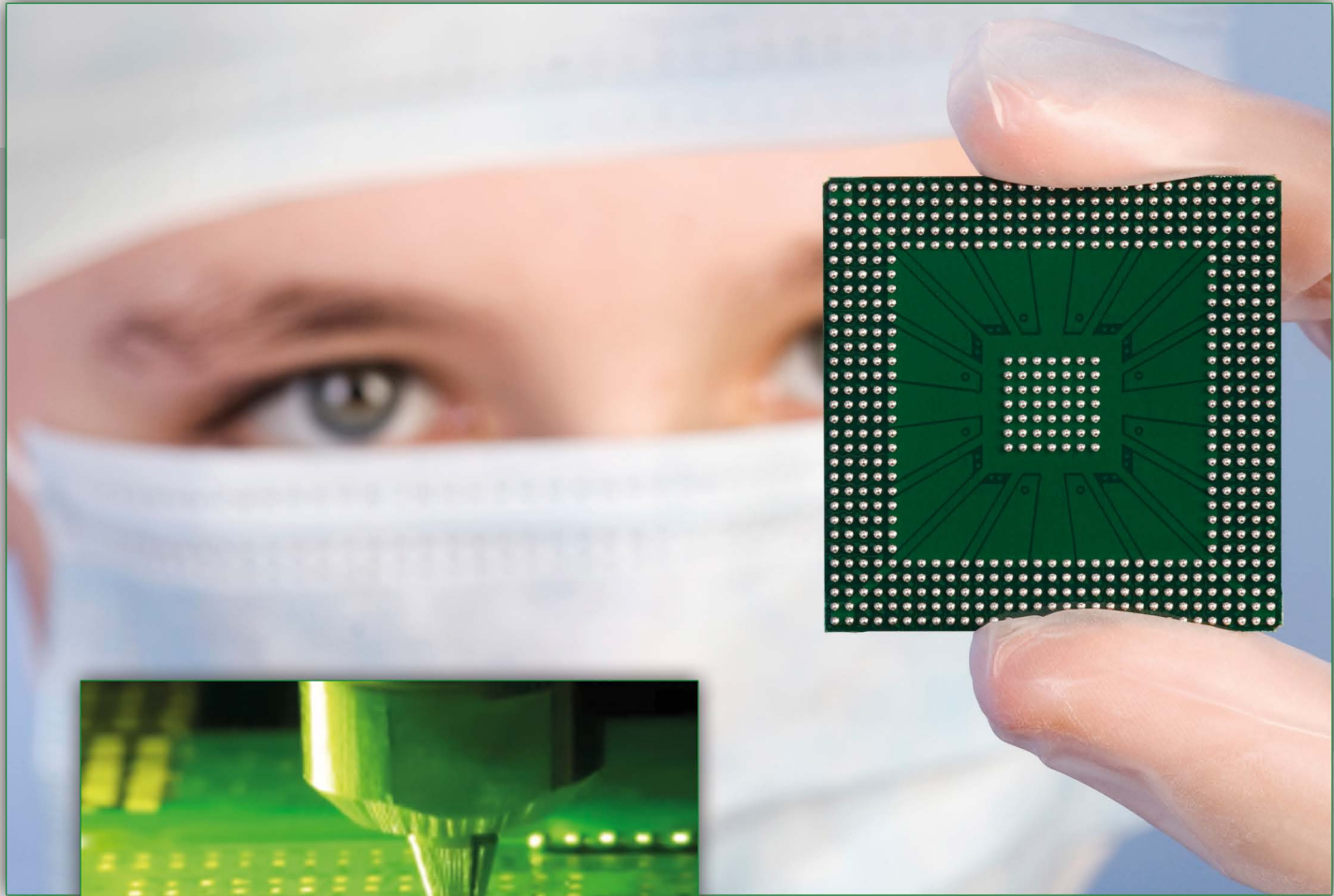
Reballing, Retinning and Component Recovery

With our strategic partner, Retronix, we are able to offer component recovery, reballing and retinning.

Retronix are the only company to offer Laser Reballing service, mitigating the need for an additional reflow thus protecting the device. Retronix are the only company with approvals from such customer as Leonardo, BAE Systems, Martin Baker Air Craft Company and many more high reliability companies are realising the need to minimise component reflow and using a laser to perform the reballing is the only way to guarantee that there is no long term damage to the silicon.

Component Reclaim is also an effective money-saving solution for many of our customers. Everyday, millions of dollars of brand new and high-value components are scrapped by manufacturers simply because they are attached to faulty/obsolete PCBs. Our process to recover and refurbish devices, including BGA Chips, not only reduces the amount and cost of scrap going to landfills but also seriously damages the counterfeit industry.





Example of Laser Reballing

PCB/PCBA Quality Control Testing

We can provide non-destructive testing methods for controlling the quality of PCBs and PCBAs.

This includes during the design and development of the assembly or during production when problems arise, or to simply ensure that there are no critical points which could cause problems when the product is in the field.

One of the critical points in this area is void analysis via X-ray inspection.

We can ensure that your assembly conforms to IPC standards using a variety of tests to ensure product quality meeting **IPC A-600** and **A-610** standards.

In case of fault detection, more invasive methods can be used to identify the root causes.

Testing methods include:

Cross sections

X ray

SEM

C3 (Point Ionic Chromatography)

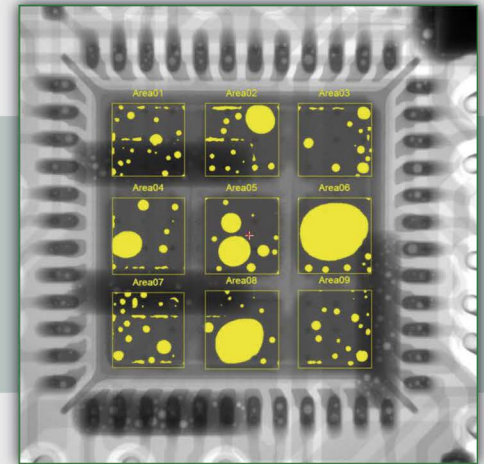
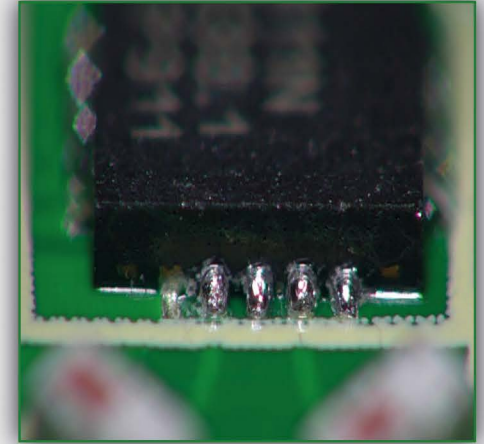
Ionic Chromatography

ROSE Testing

Optical Inspection

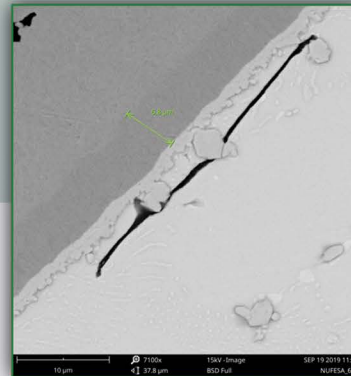
3D Measurement

OPTICAL INSPECTION

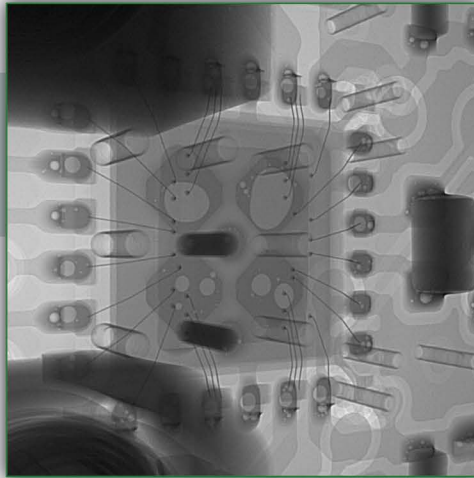


Example of Voiding

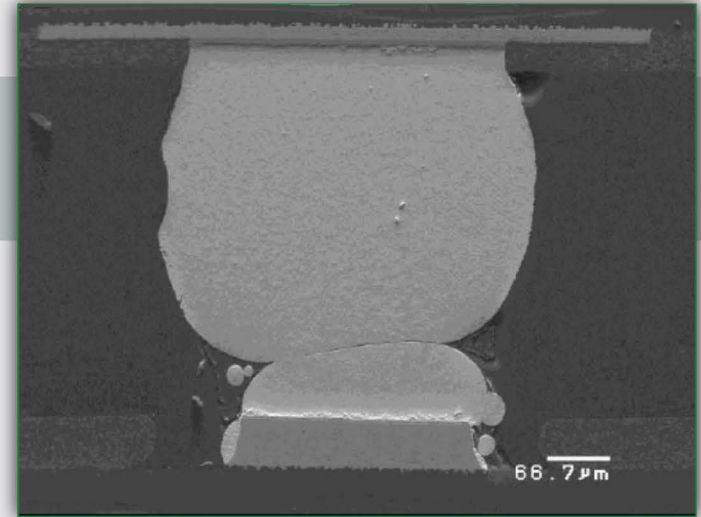
CROSS SECTIONS



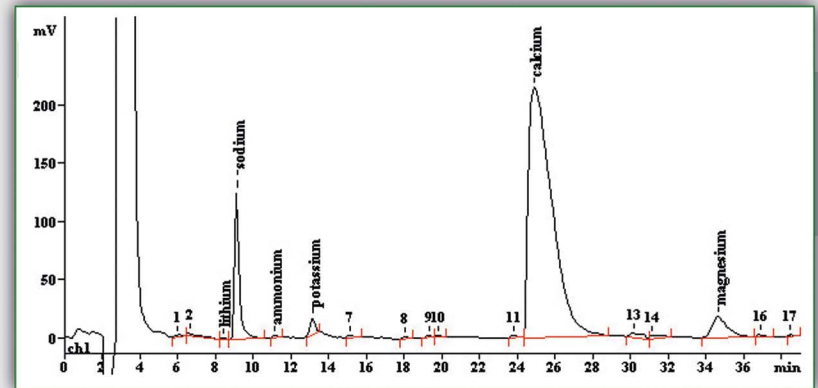
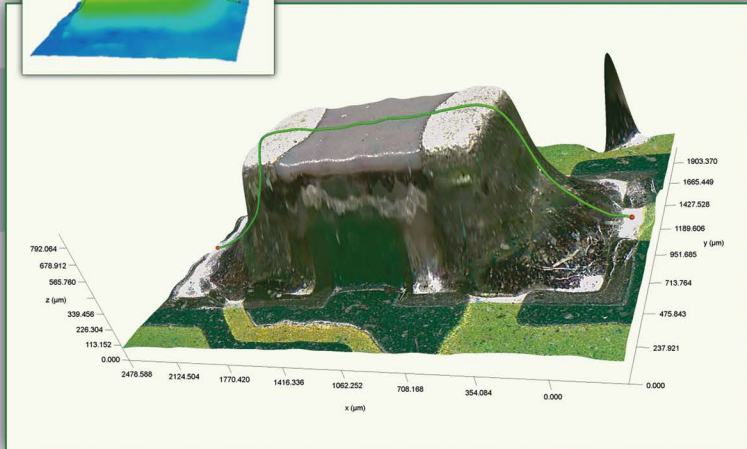
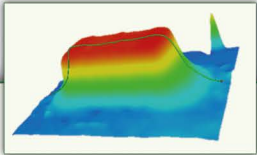
X RAY



SEM



3D MEASUREMENT



IONIC CHROMATOGRAPHY

Electronics Reliability Testing

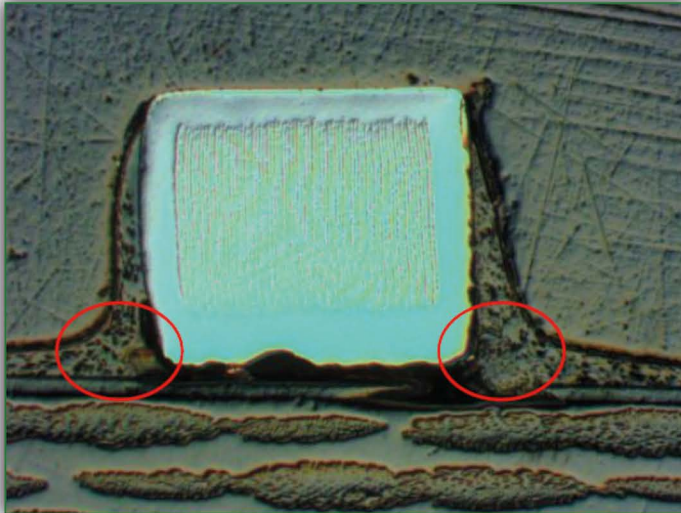
This service allows us to testing the reliability of assemblies and products in real life conditions. These process can help validate assemblies which can be subject to a wide variety of atmospheric conditions.

Testing methods include:

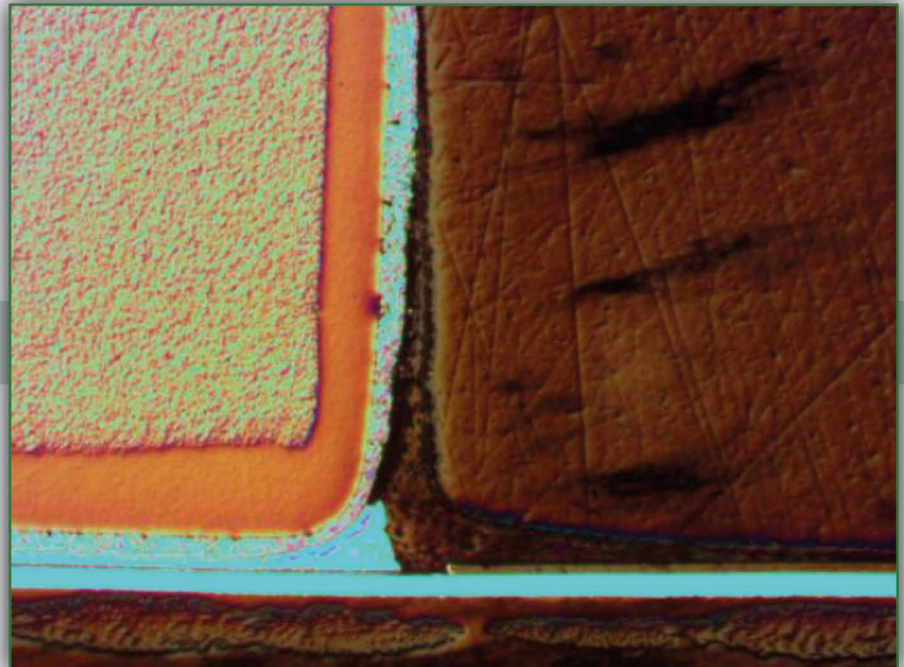
Climate Chamber

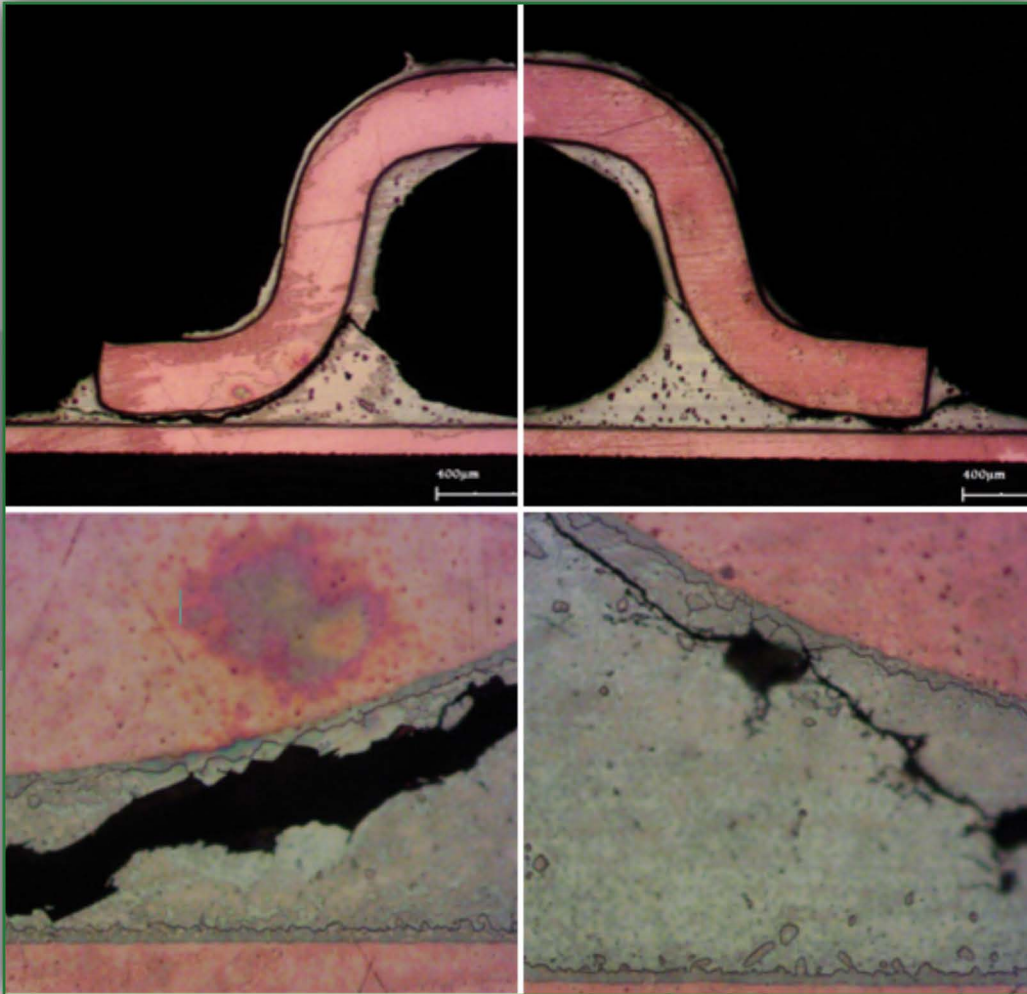
Optical Microscopy

Cross sections

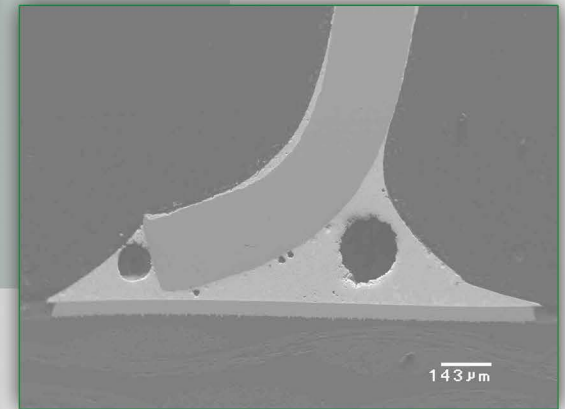


OPTICAL MICROSCOPY



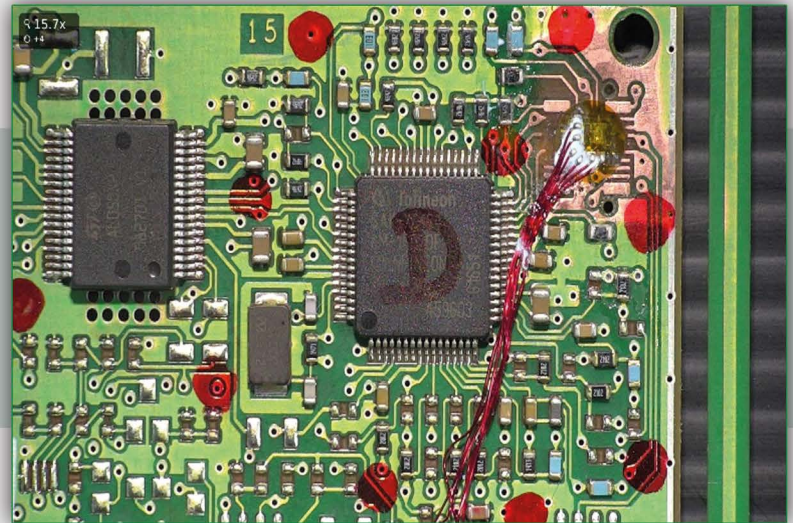
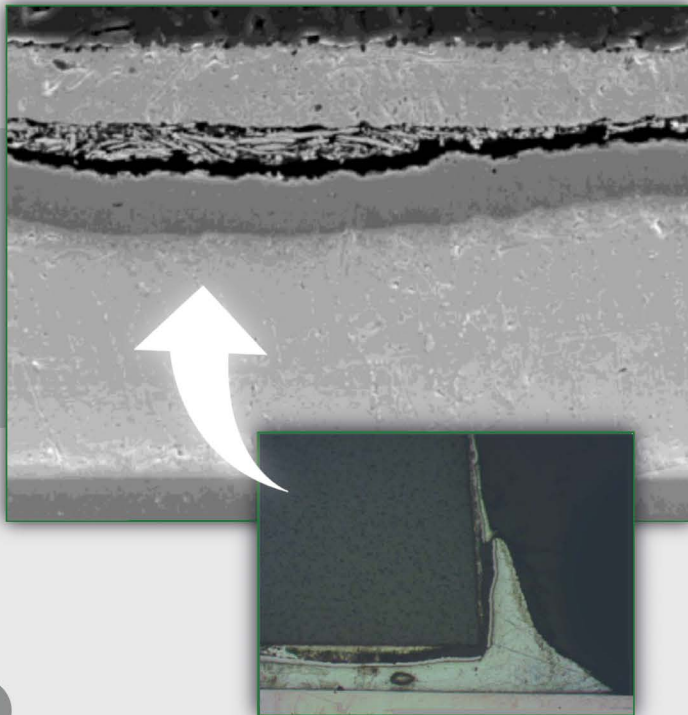


CROSS SECTIONS



Strain Deformation Testing

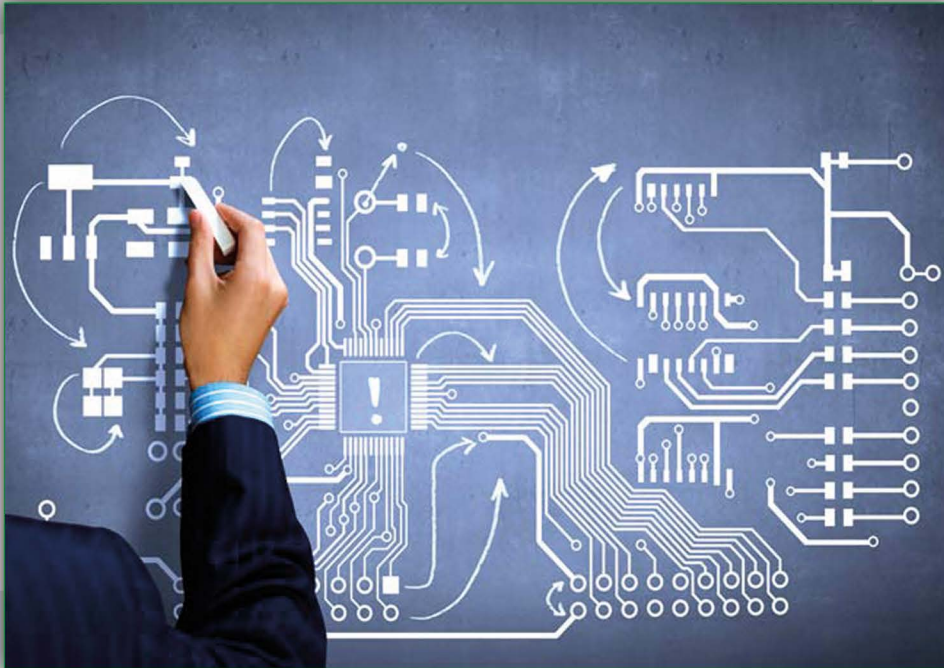
Strain deformation testing allows us to determine the strain on the PCB materials due to static and dynamic loads which are caused by both internal and external mechanical, thermal and pressure sources.



Electronic Design Assessment

WE HELP:

- Study and analysis of designs proposed by the customers.
- Endurance and Reliability tests for design evaluation.
- Precertifications tests to detect and fix deviations which could appear during final certification process.





NUFESA Labs

smart testing



NUFESA

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