

G R O U P E   S E R M A   T E C H N O L O G I E S



**SERMA TECHNOLOGIES**

Counterfeiting and falsification of electronic components :  
Detection and risk management

## Objectives

**Secure a lot coming from a not certified origin.**

- ✓ Check the component **origin** and **history**.
- ✓ Look for **falsification / couterfeiting** evidences.
- ✓ Check the component **integrity**.
- ✓ Check the component **functionality**.

## Specificities

**Securing a lot coming from a not certified origin.**

- ✓ **Component types :**  
obsolete or not, discrete (active and passive) and integrated.
- ✓ **Customers:** Brokers(<20%), EMS(<20%), final users(>60%, often through brokers).

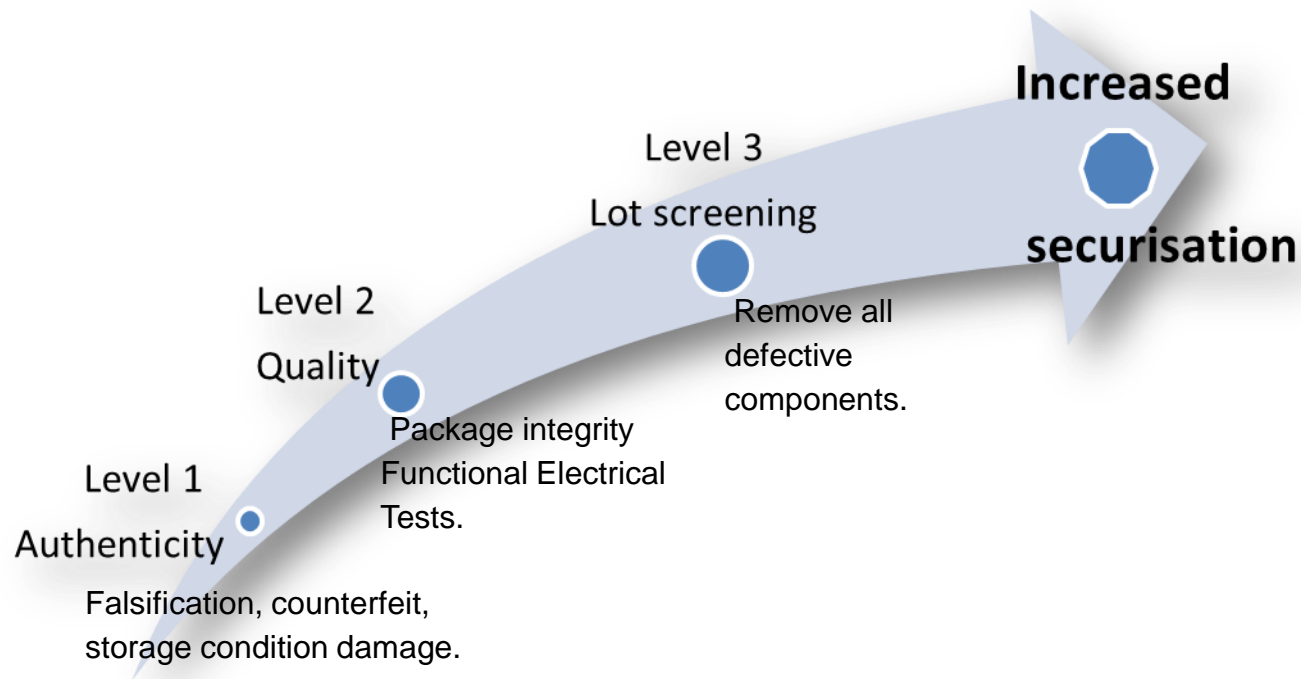
## Specificities

### Securing a lot coming from a not certified origin.

- ✓ **Acceptance criteria:** adjusted to old and handled components.
- ✓ **Market :** Risky and rapidly changing.
- ✓ **Lead time :** short
- ✓ **Cost :** balance between lot value and test cost.
- ✓ **Test flow** according to customer flow or Serma Technologies 3 levels offer.

# Counterfeiting and falsification of electronic components **securisation levels**

## SERMA TECHNOLOGIES 3 LEVELS OFFER.



# Counterfeiting and falsification of electronic components **securisation levels**

## **LEVEL 1 : AUTHENTICITY.**

Visual and X Rays inspections, decap and internal visual to

- ✓ Check the **History** of component, manufacturer, PCN, EOL.
- ✓ Check the **Conformity** of marking : format, scrape and/or solvent test.
- ✓ Check the storage conditions, handling, evidence of refurbishment or falsification.
- ✓ Check the homogeneity, conformity of internal connections and construction. (X rays inspection).
- ✓ Check the manufacture quality. Die marking. Comparison with our database. Consistence between die design and die function. (Internal inspection).



## **LEVEL 2 : QUALITY.**

Construction, storage consequences, electrical check.  
Includes solderability test, acoustic microscopy inspection  
and electrical check, to

- ✓ Check the quality of manufacturing.
- ✓ Check consequences of storage.
- ✓ Check functionality.

## **LEVEL 3 : SCREENING.**

Electrical Testing, physical, up screening to

- ✓ Perform full functional 3 temperatures electrical test,.
- ✓ Up screen.
- ✓ Perform non destructive physical screenings.
- ✓ Re-package.
- ✓ Perform re-conditioning
- ✓ ...



## SECURISATION TOOLS IMPROVEMENTS

- ✓ **Monitoring new and more efficient falsification technics :**

Polishing, chemical, micro sand blasting, blacktopping...

- ✓ **Implementation of more accurate technics and tools:**

Visual criteria, chemical etchings, flat polishing, cross sectioning, acoustic microscopy but also data base, sampling, electrical measurements...

## ELECTRICAL CHECKING:

- ✓ Implementation of electric test solutions with a short lead time and at low cost (4-10 days).
- ✓ Interfaces development and production automation.
- ✓ Definition of relevant and easy to implement parameters for each component type.

## REFERENCE DOCUMENTS :

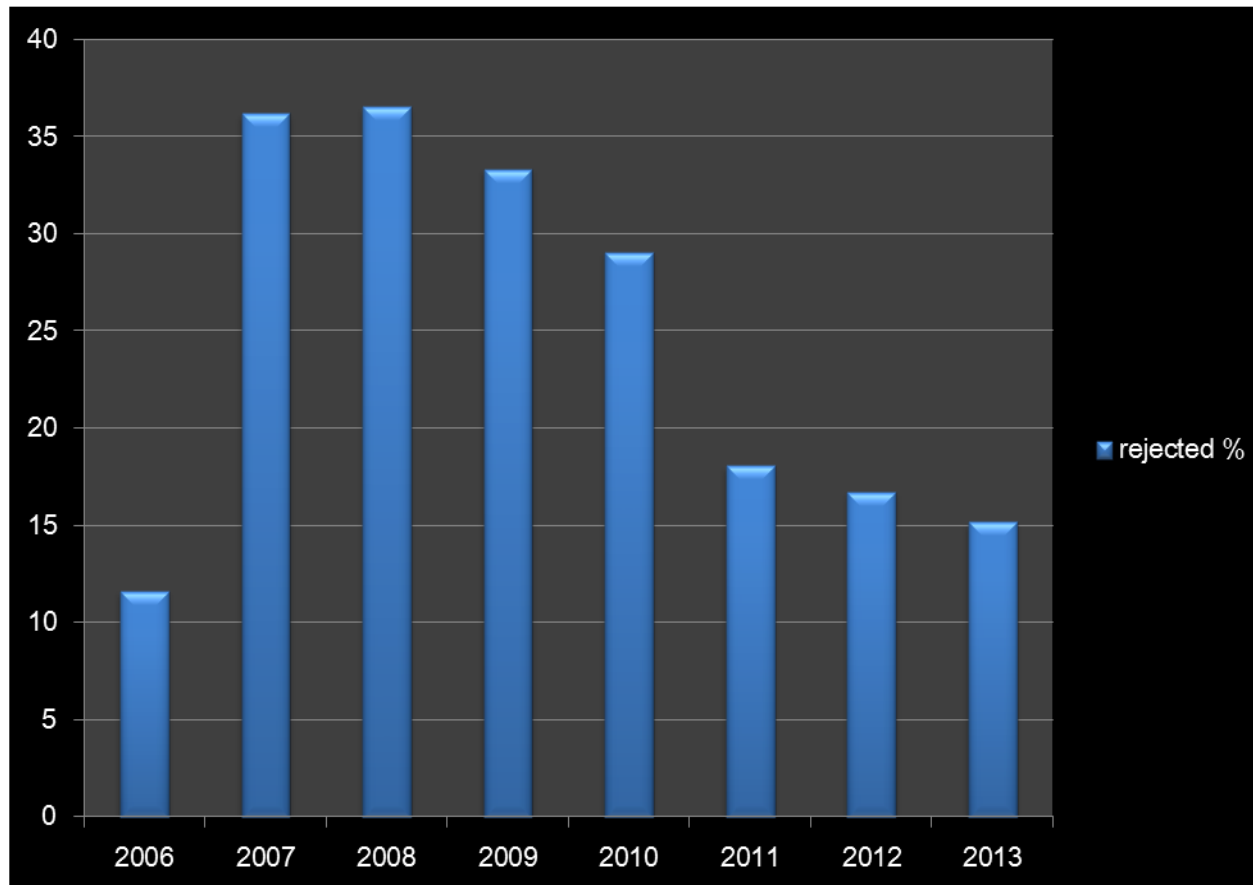
- ✓ MIL-STD-883H, MIL-STD-750F or MIL-STD-1580B depending on component type.
- ✓ SAE AS5553 “Counterfeit Electronic Parts; Avoidance, Detection, Mitigation and Disposition”.
- ✓ IDEA-STD-1010B.
- ✓ PLAB-015 SERMA Technologies procedure for incoming inspection of broker lots.



## STATISTICS

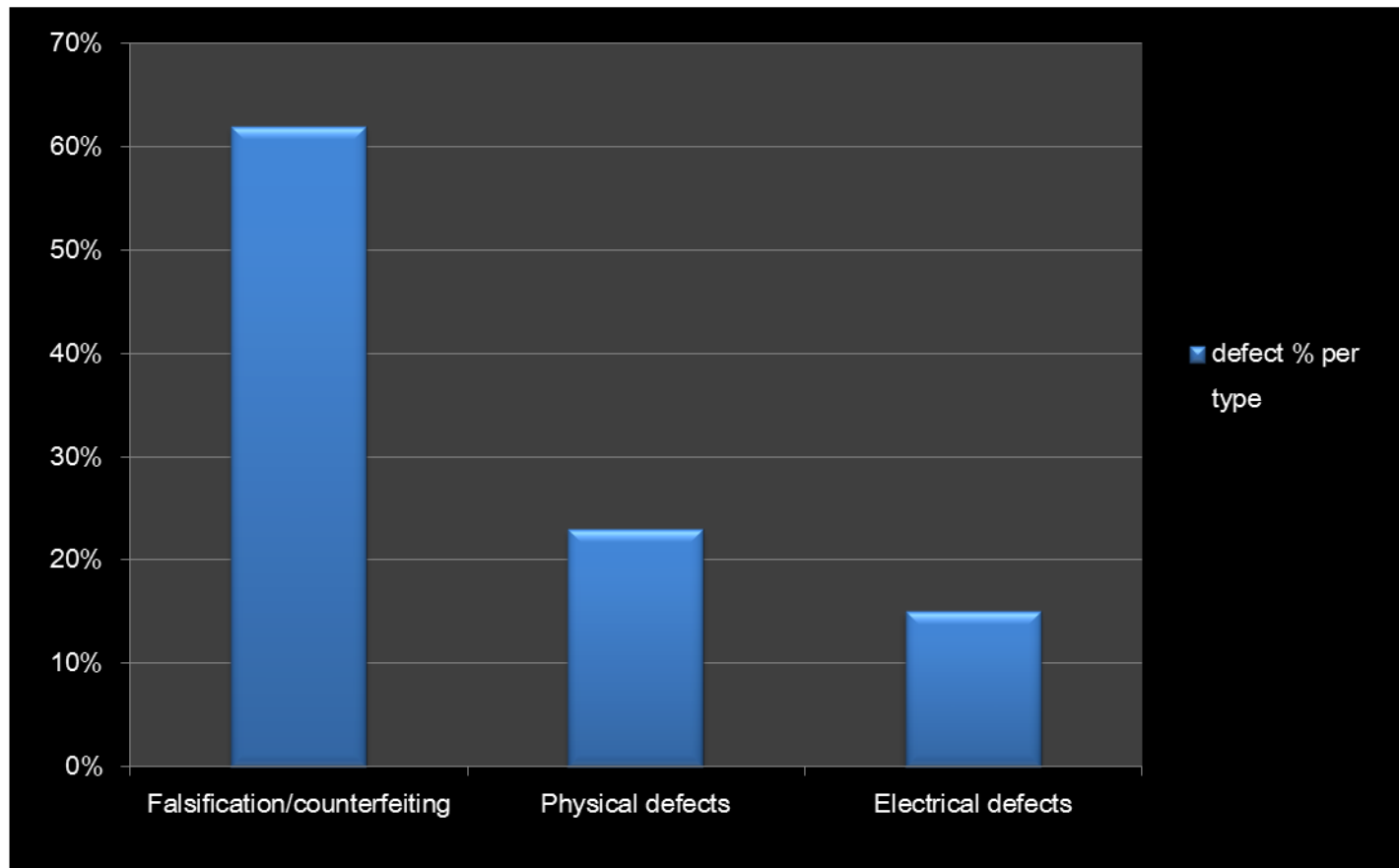
# Counterfeiting and falsification of electronic components statistics

## NUMBER OF ANALYSED / REJECTED BATCHES %



# Counterfeiting and falsification of electronic components statistics

## Percentage of defect per type.





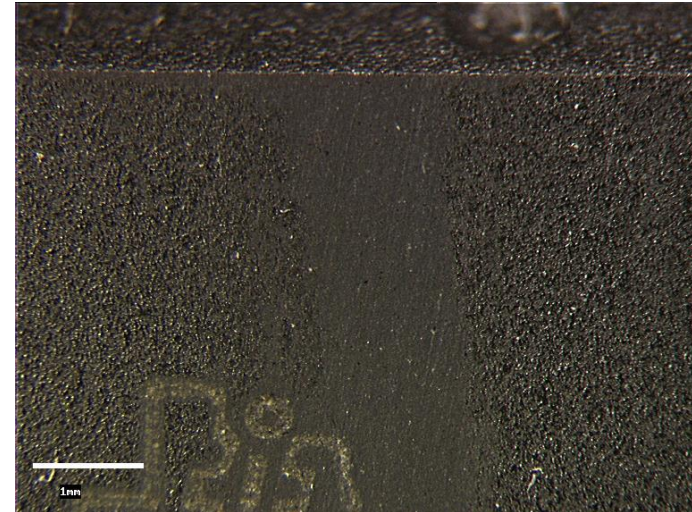
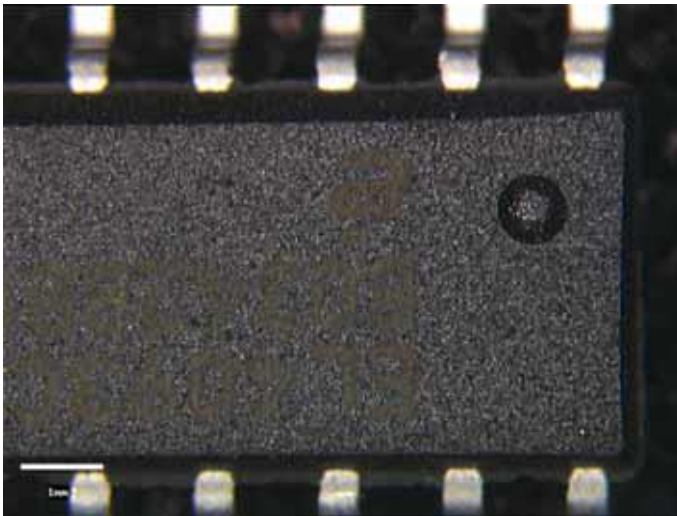


## EXAMPLES

# Counterfeiting and falsification of electronic components

## Examples

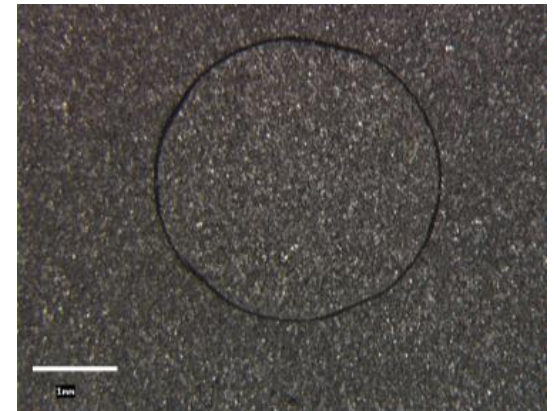
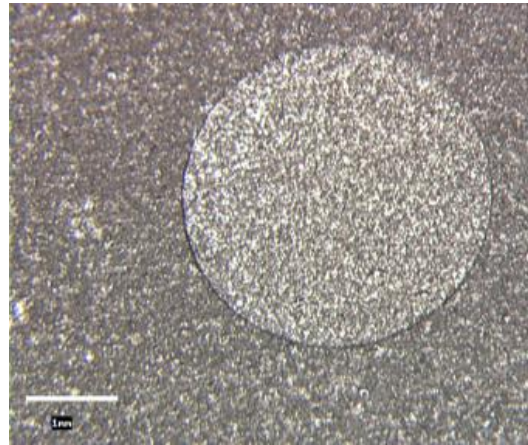
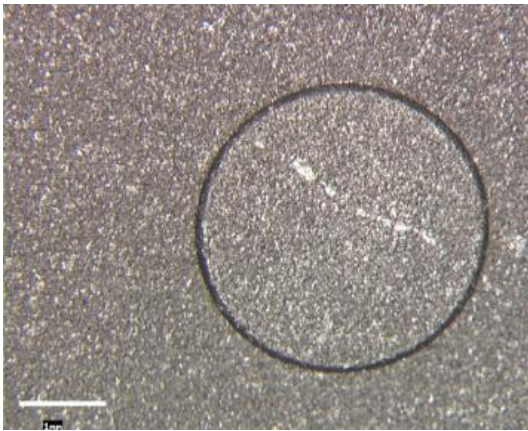
### Visual inspection



# Counterfeiting and falsification of electronic components

## Examples

### Visual inspection

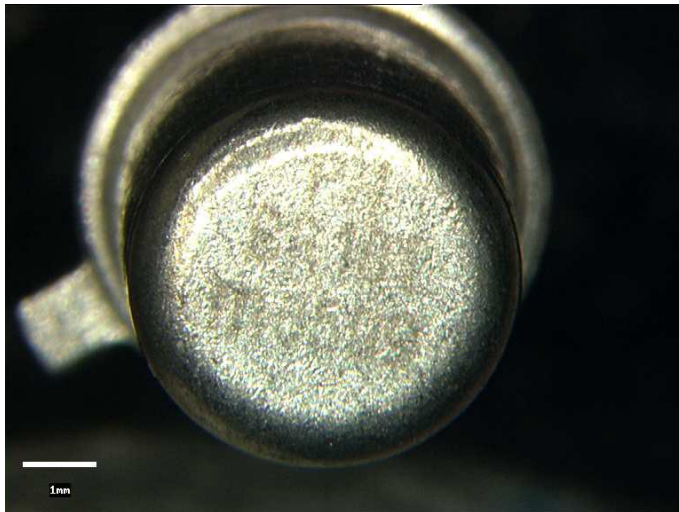




# Counterfeiting and falsification of electronic components

## Examples

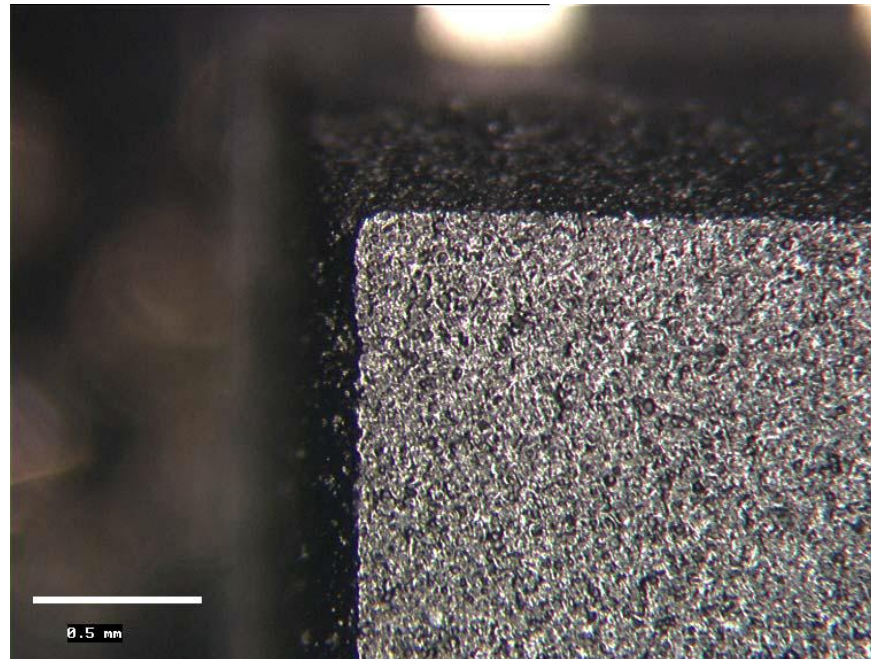
### Visual inspection



# Counterfeiting and falsification of electronic components

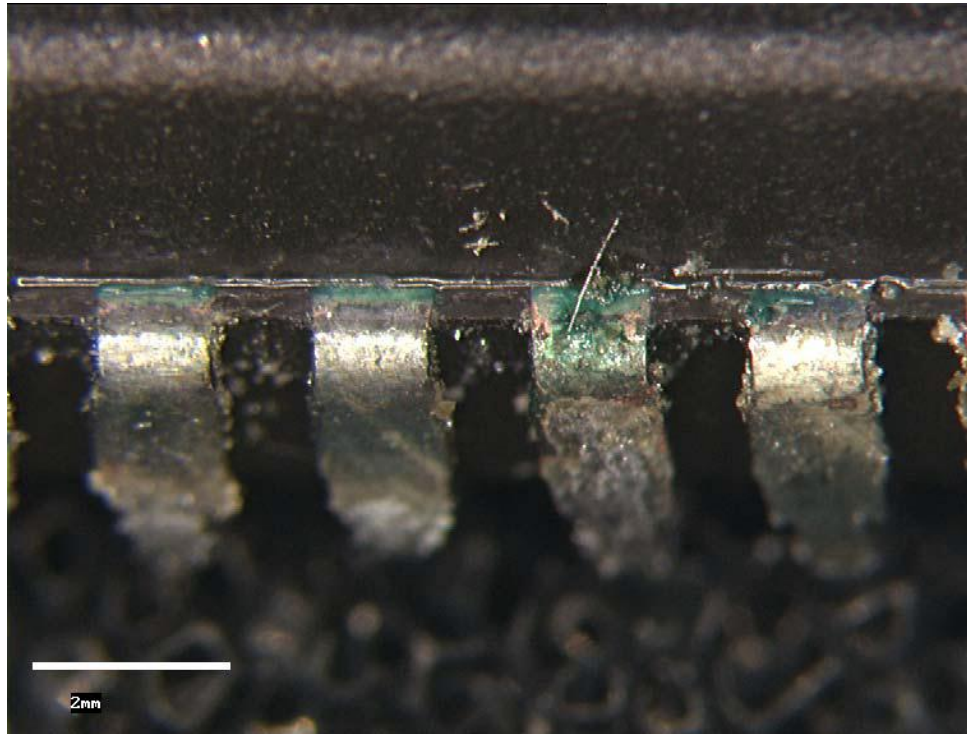
## Examples

### Visual inspection



## Examples

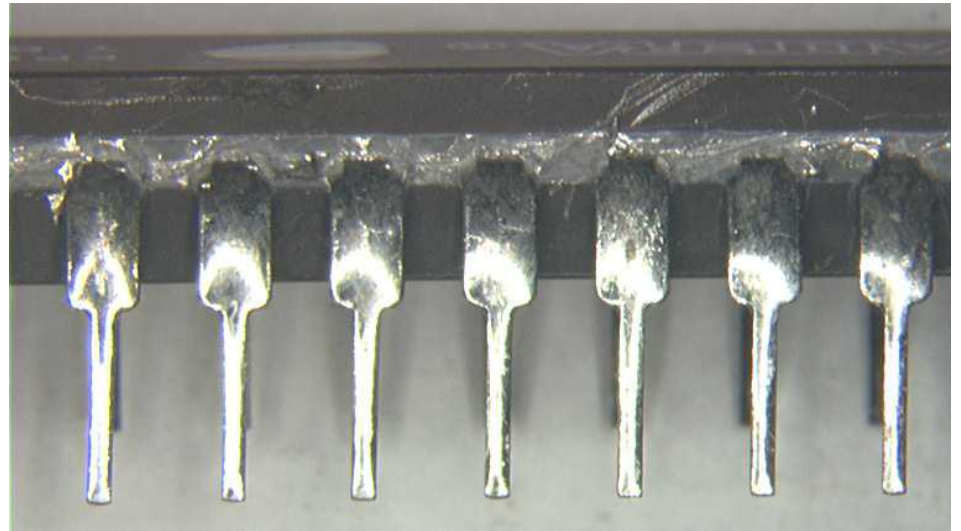
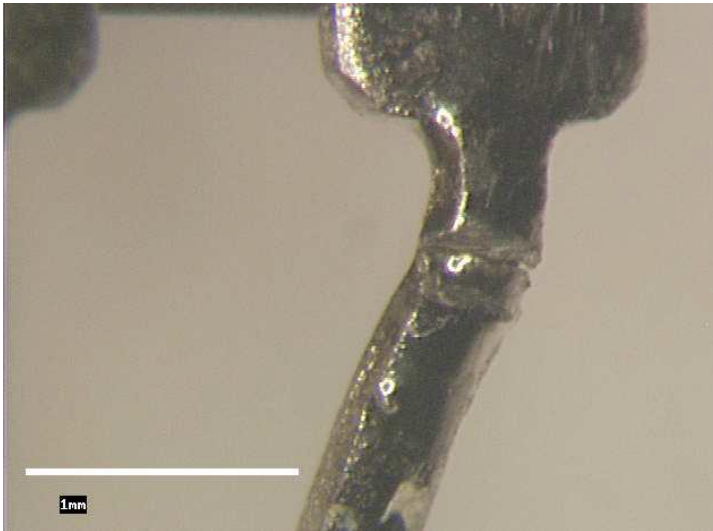
### Poor storage conditions / refurbishment





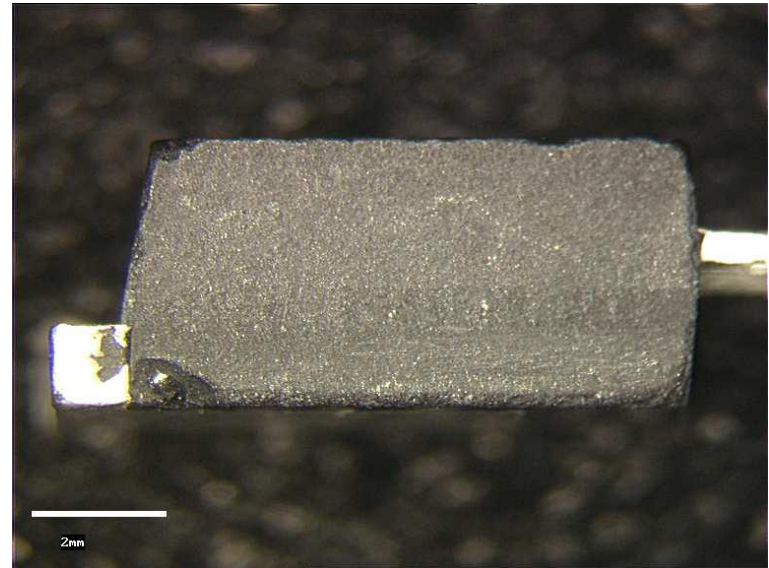
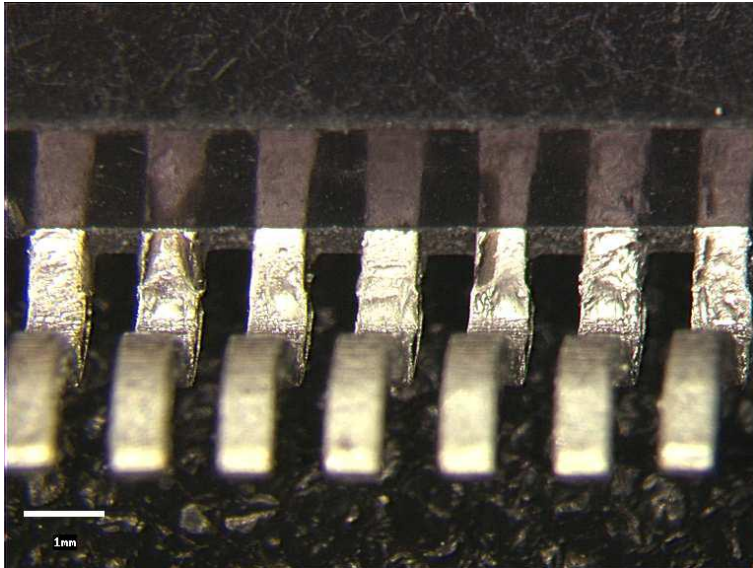
## Examples

### Poor storage conditions / refurbishment



## Examples

### Poor storage conditions / refurbishment



# Counterfeiting and falsification of electronic components

## Examples

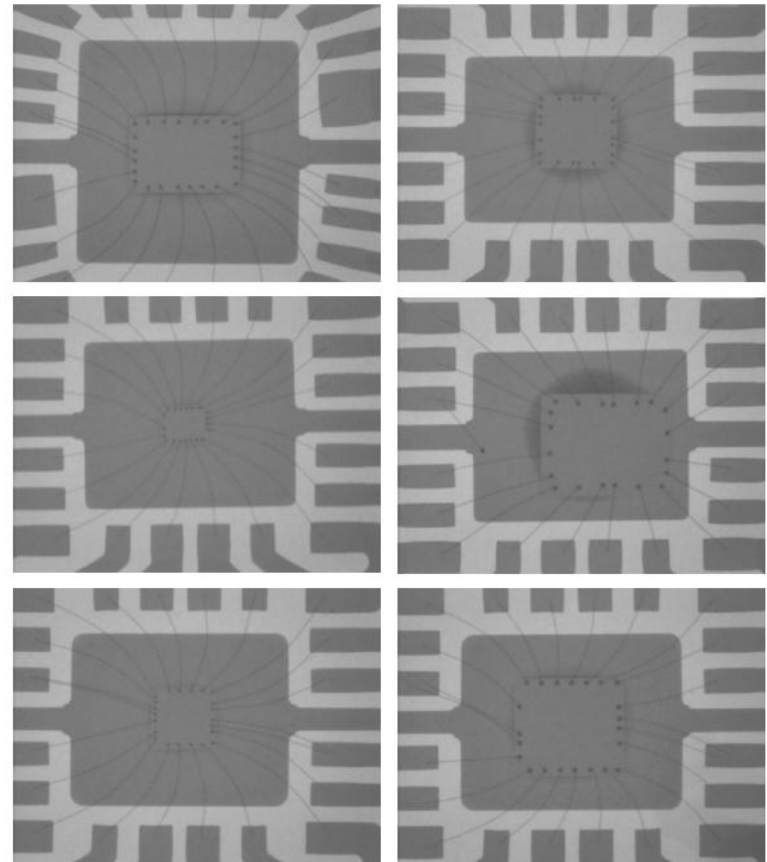
### falsification





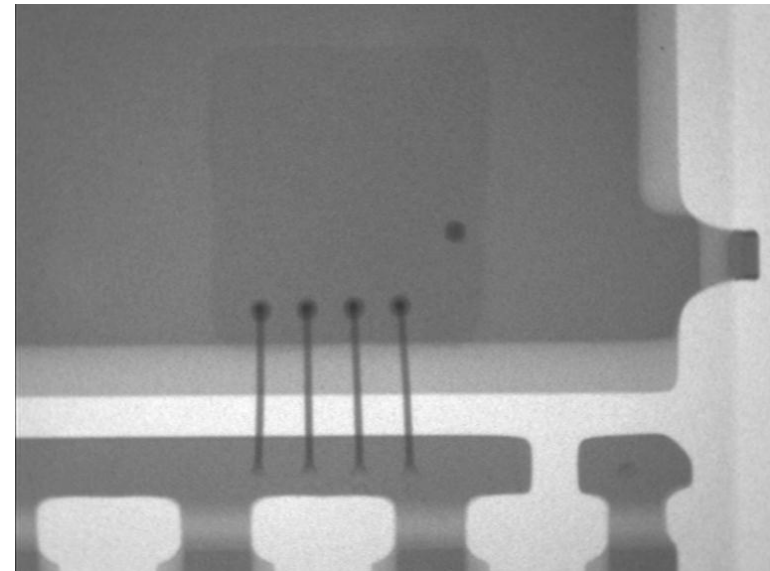
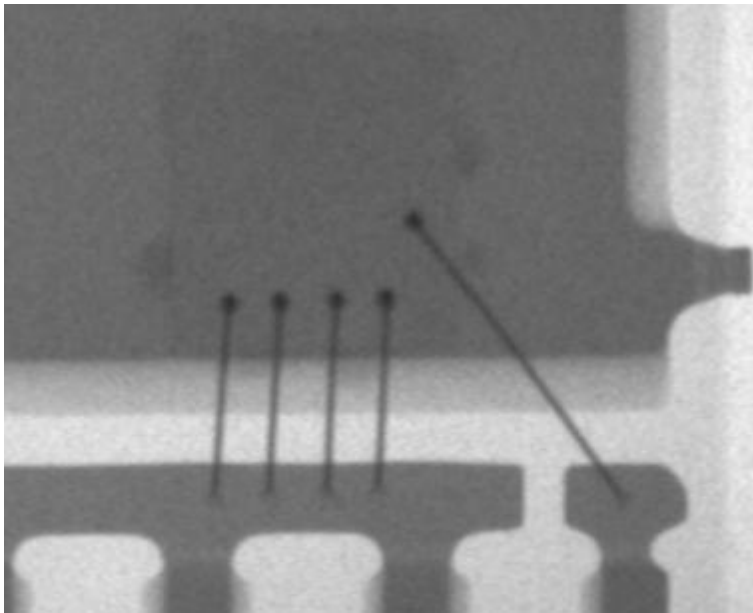
## Examples

### X Rays : homogeneity



## Examples

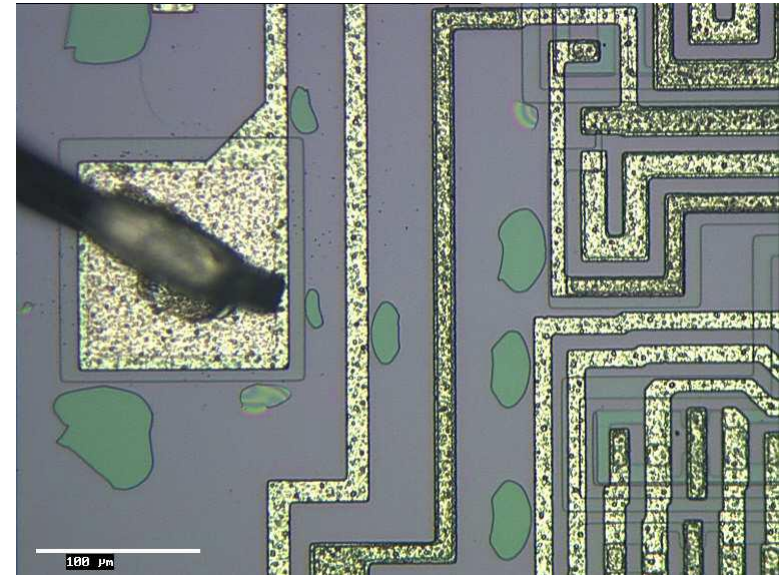
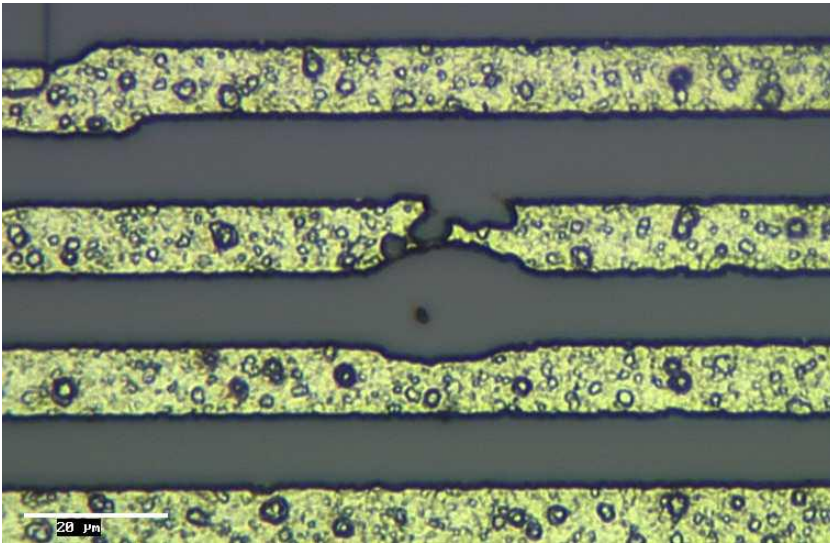
### X Rays : construction



# Counterfeiting and falsification of electronic components

## Examples

### Internal inspection : die construction defect

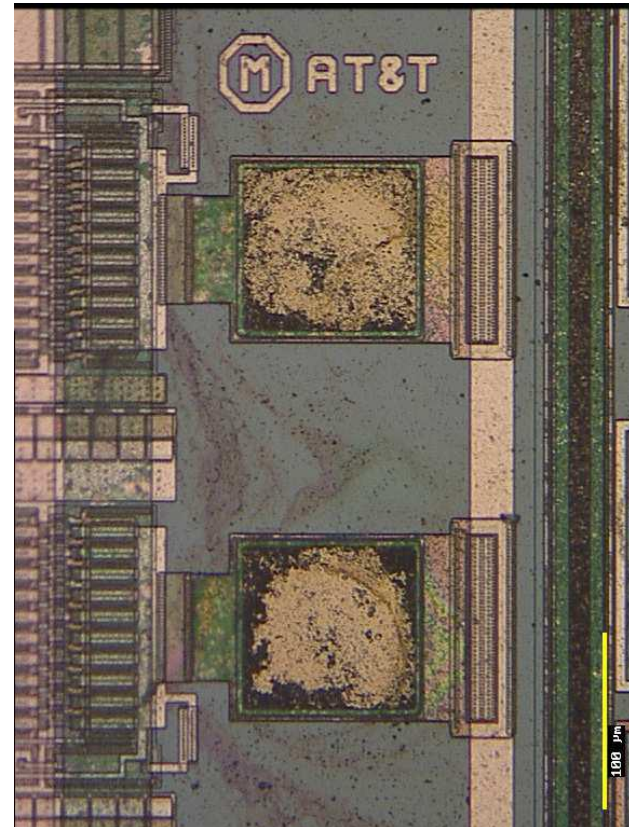
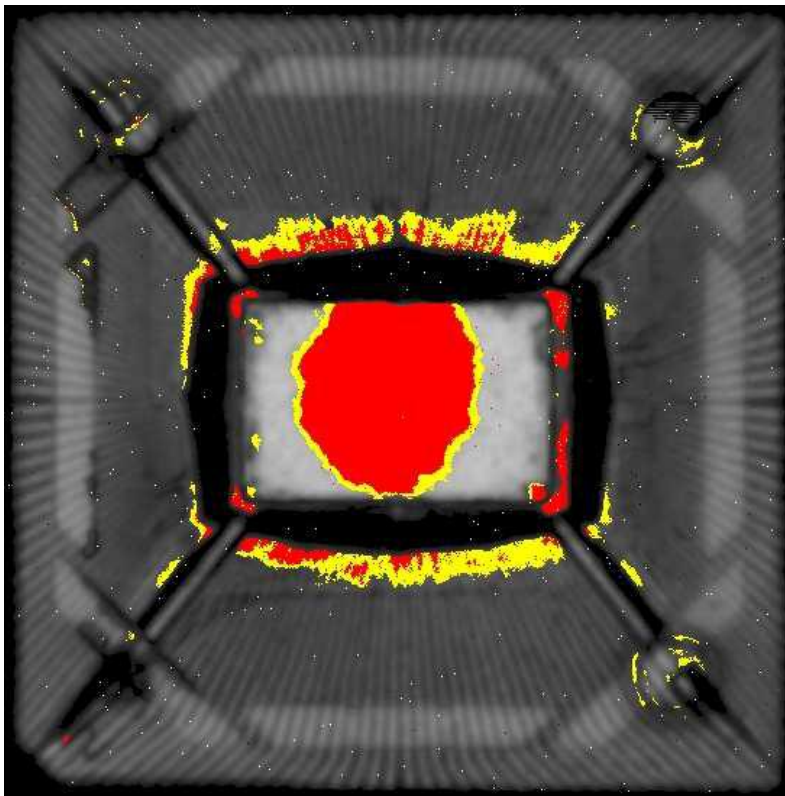




# Counterfeiting and falsification of electronic components

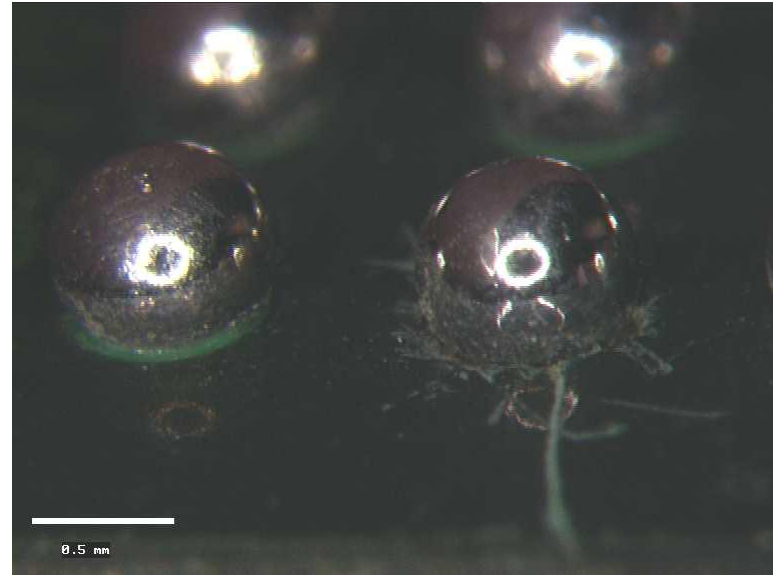
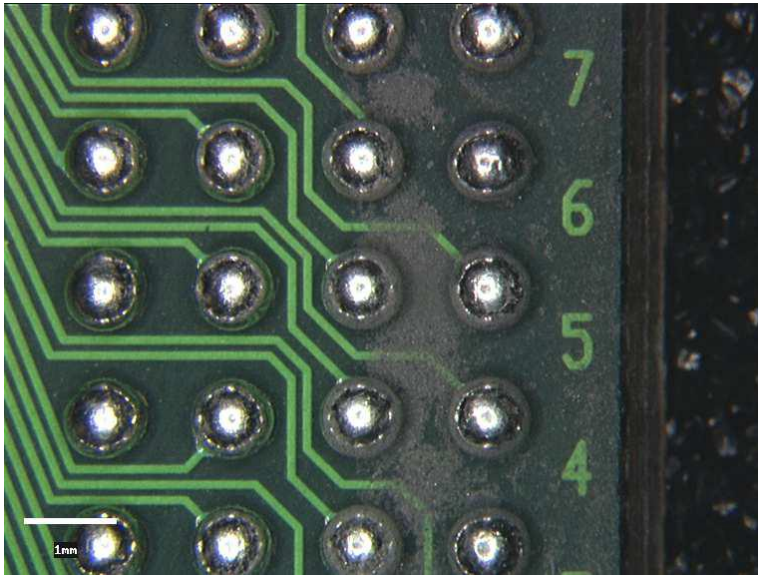
## Examples

### Poor storage conditions / disassembly



## Examples

### Refurbishment / reballing





## Examples

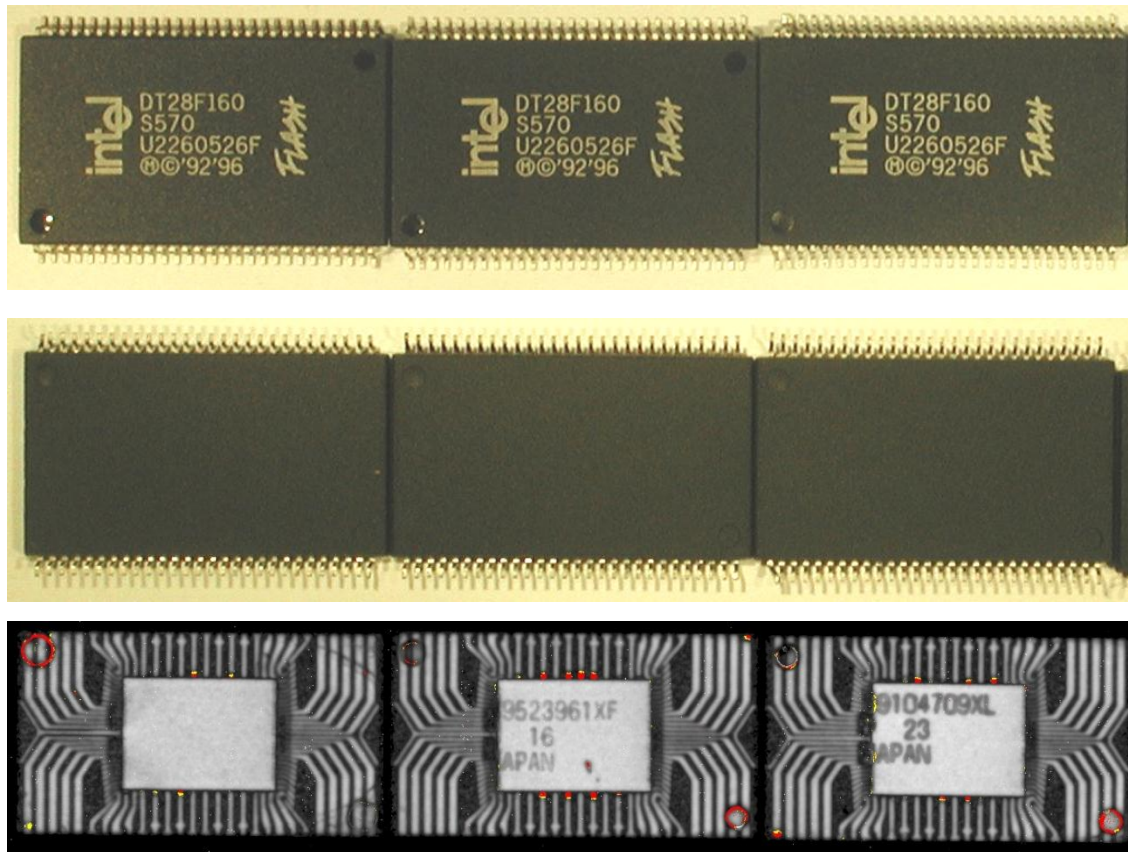
### Visual / acoustic microscopy



# Counterfeiting and falsification of electronic components

## Examples

### Visual / acoustic microscopy



## Examples

Merci de votre attention.  
Thank you for your attention