Examples of Whiskergrowing in Industry Applications

Main focus

- Pure tin on flex connectors with acceleration by plastic deformation
- Lead frames as connector and conductor
- Less critical whisker on IMSn boards
Pure Tin on Flex-Connectors

Flex-Connector with Gold finish (industry computer)

Flex-Connector with Pure Tin Finish (terminal system)

Deformation driven
Whisker growing
After 1 year in operation
Pure Tin on Flex-Connectors

High risk of conductor shortening by whisker growing

Details
Whisker on Flex-Board connectors after ½ Year in Operation (automotive)

Risk of shortening

Different whisker growth – nobody knows the reason
Whisker growth on automotive part

- brass frame tin plated
- No Ni-barrier layer
- Storage in my office environment
- 7 years
- 2005 examined by another problem

History

End product
Automotive unit
No defects known
Advantage: heat treatment
By encapsulation
Visual inspection

Whisker are bright
Visual easy to find
Primary at areas with Tensions (cutting edge)

After 7 Years Inspection

Many whiskers are on the surface
After 7 Years Inspection

No primary direction
EDX analysis shows pure tin

Many whiskers on the surface of the cutted area
Different starting structures

Whisker on IMSn-finished Boards (only one sample in 15 years)

Examined because the boards create white residues in the reflow oven
Other Whisker growings

Lead free chip resistor not reflowed
Fixed with conductive adhesive after storage 100h 85°C/85 rel. H.

Conclusions

Problem of the Whisker growing:
No incoming test available to test the risk
Only during qualification tested (IPC Tests)

High Risks:
All pure tin platings not reflowed

Example:
• Connectors
• Press-fit Contacts
• frames