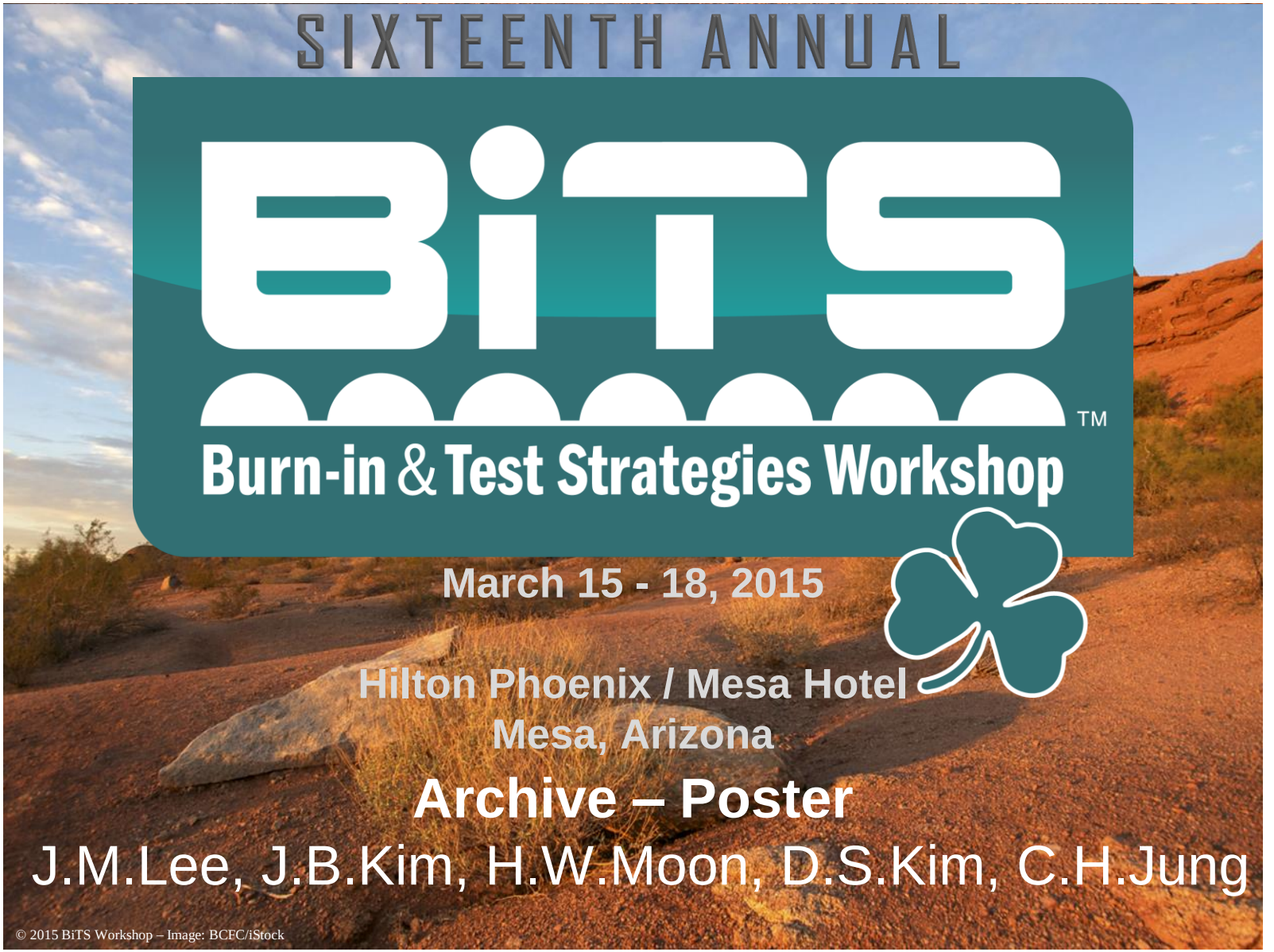
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# Laser Cleaning vs Brush Cleaning

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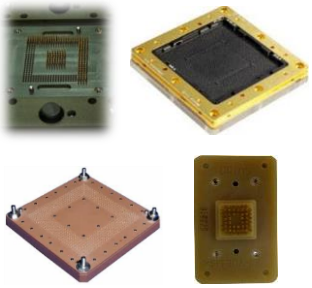
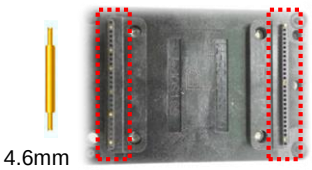
The pin cleaning of test sockets is a critical process in order to maintain the high test yield and increase the machine uptime. There are 2 typical cleaning methods - brush cleaning and laser cleaning in the test field.

In this work, two cleaning methods were applied for the same type of pogo pin socket and investigated the pin change at regular cleaning intervals.



## Test Sample & Experimental Set-up

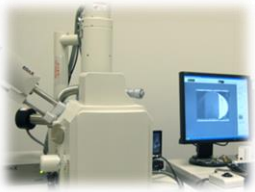
TSOP Pogo Pin Socket




Cleaning Brush & Laser



SEM/EDS Tool



Rc Tester

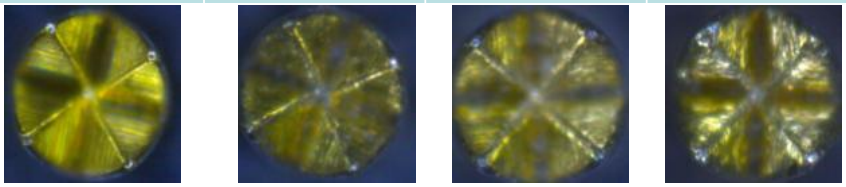
IMT200CT – FDR measuring tool

## Microscopic Investigation with Cleaning Numbers

**Brush Cleaning**

A significant surface change was found even after 60 shots.

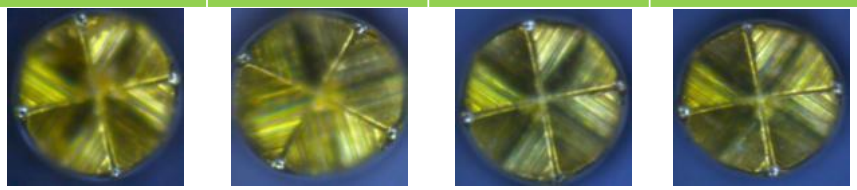
| Before | After 60 shots | After 150 shots | After 300 shots |
|---|---|---|---|



**Laser Cleaning**

A significant surface change was not found even after 300 shots.

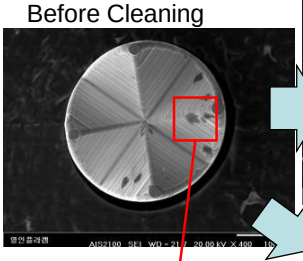
| Before | After 60 shots | After 150 shots | After 300 shots |
|---|---|---|---|



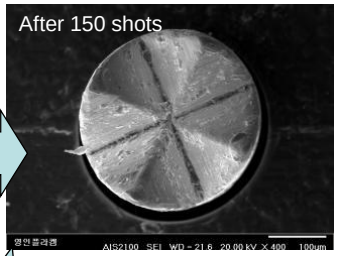
## SEM/EDS Investigation after 300 Cleaning Shots

**Brush Cleaning**

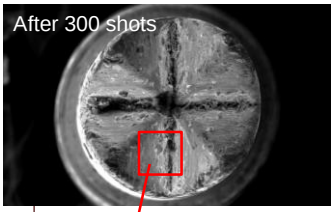
Before Cleaning

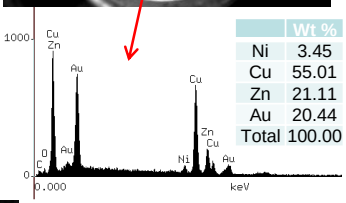


After 150 shots



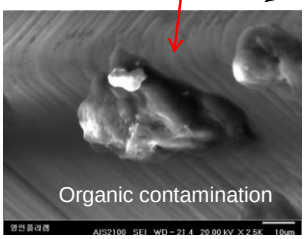
After 300 shots



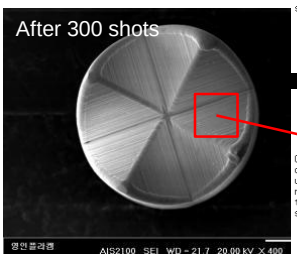


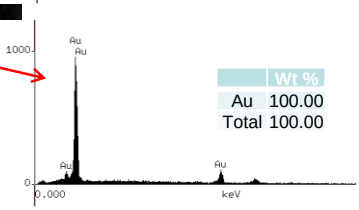

| | Wt % |
|---|---|
| Ni | 3.45 |
| Cu | 55.01 |
| Zn | 21.11 |
| Au | 20.44 |
| Total | 100.00 |

**Laser Cleaning**



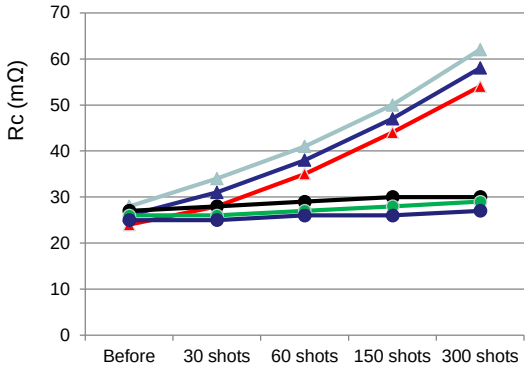

After 300 shots






| | Wt % |
|---|---|
| Au | 100.00 |
| Total | 100.00 |

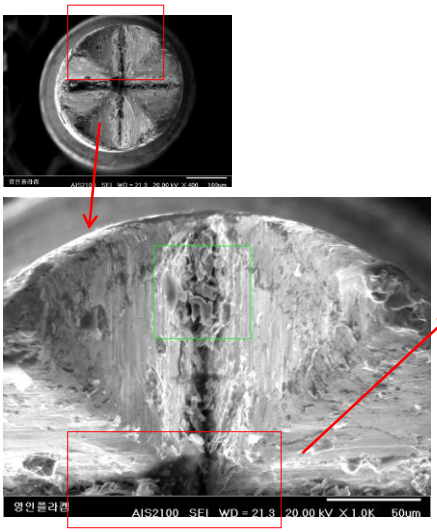
## Contact Resistance Change with Cleaning Numbers

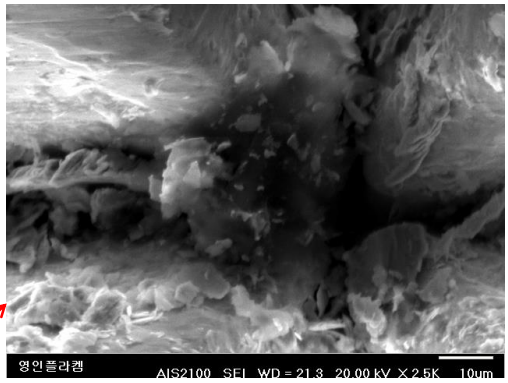



In brush cleaning, Rc increased even after 30 shots and more than 100% up after 300 shots.

In laser cleaning, Rc showed no significant change after 300 shots.

## Significant Leakage Cause from Brush Cleaning






The debris and particles on the crown valley and the surfaces generated after brush cleaning could be a significant leakage cause during the test.

## Conclusions

- From the SEM/EDS analysis, the Au coating and the tip was worn out after 60 shots of the brush cleaning. There was no significant surface change even after 300 shots of laser cleaning.
- From Rc measurement, the contact resistance increased more than 100% after 300 shots of brush cleaning. There was no significant change after laser cleaning.
- It was found that the surface became very rough and lots of debris accumulated inside the crown surface. The debris and particle from the surface could be a significant cause of leakage during the test.