

Probe Card On-line Cleaning

Gene Humphrey
International Test Solutions, Inc.
Livermore, CA 94550
SWTW 2000



Contributors

- John Reynolds Motorola
APRDL
- Bill Fulton
Wentworth Laboratories
- Monte Laskosky
Gel-Pak
- Sadafumi Tamakoshi
Tokyo Seimitsu Co.,
Ltd.
- J. D. Ross
FormFactor, Inc.

Off-line Cleaning

- Abrasive or Destructive cleaning
 - Alcohol, Air, Q-Tips, Lapping Film
- Debris Removal and Collection
- Increased Handling and Damage
- Downtime/Reduced Throughput

On-Line Cleaning

- Remove Loose Debris
- Remove Embedded or Bonded Debris
- Tip conditioning/Reshaping
- Minimize handling and damage
- Increase Throughput
- Stable and Accurate Test Results

Industry Needs

- Cost Effective On-Line Cleaning
- Effectiveness of Abrasive Cleaning
- Characteristic of Non Abrasive Cleaning
- Non-Abrasive Debris Collection
- Wide Temperature Applications -40°C to 150°C
- Easy to Use Products
- Environmentally Safe Products

Product Families

- FormFactor Cleaning Wafer - 1997
- Probe Clean – Non-Abrasive Debris Collection
 - Recommended for all Probe Types
- Probe Scrub – Light Scrub
 - Reduces CRES for flat tip
- Probe Polish – Removes and Collects Embedded or Bonded Debris
 - Reduces CRES for flat, radius, round tips and Cobra



Probe Clean

- Basic Material for all Products
- Non-Abrasive Highly Crossed Linked Polymer
 - Collects Debris
 - Reduces CRES by Removing Loose Debris
 - Extends Probe Card Life
 - Leaves No Residue on Probes or in Prober
 - -50°C to 200°C Operating Temperature
- Use with all Probe Materials and Tips

Before Probe Clean

Pictures Courtesy TSK



Contact 5000 times
(Mag: 1500)

After Probe Clean

Pictures Courtesy TSK



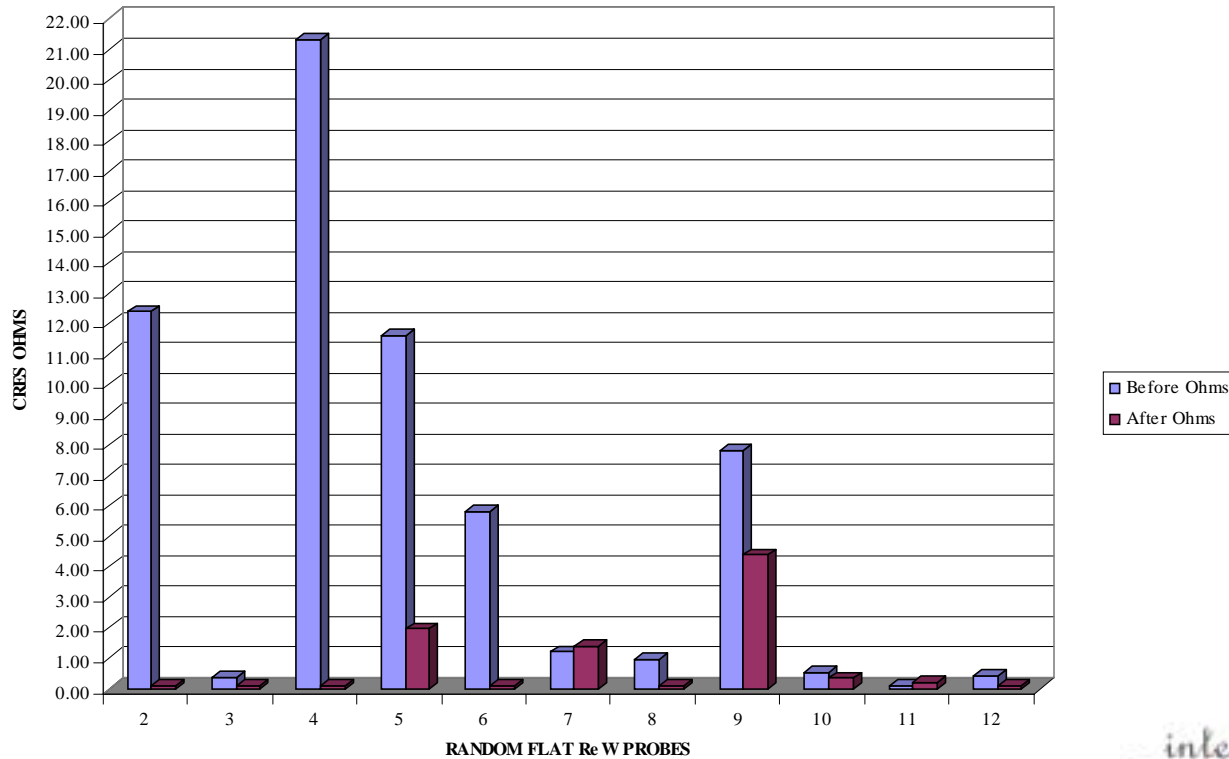
After Cleaning
(Mag: 1500)



Probe Clean Results

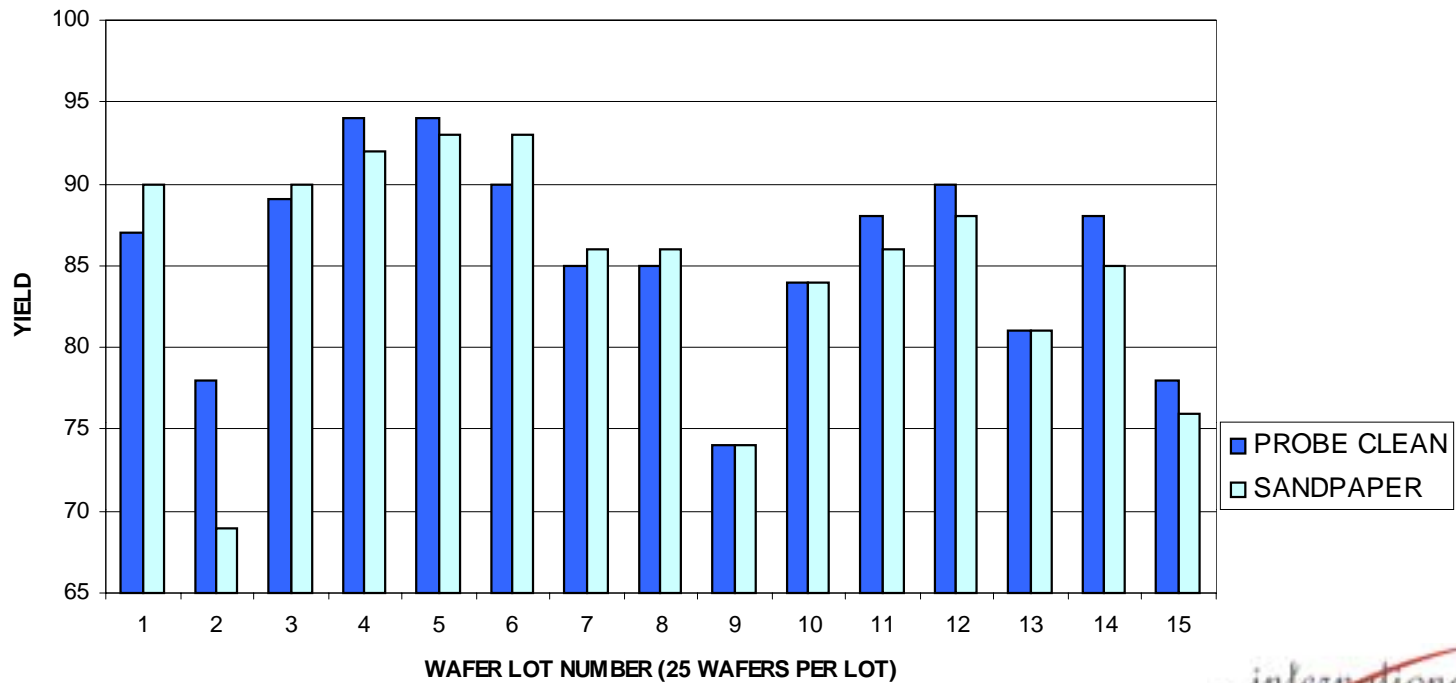
Motorola APRDL
27 SEP 99

PROBE CLEAN TEST RESULTS



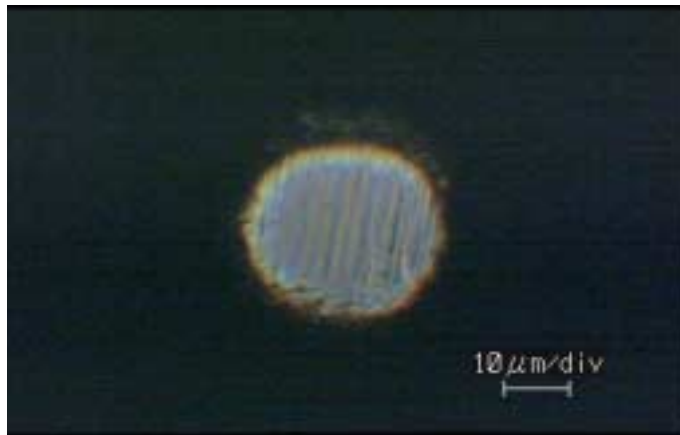
Probe Clean Yield Improvement

PROBE CLEAN vs SANDPAPER



Need for Aggressive Cleaning

Pictures Courtesy TSK



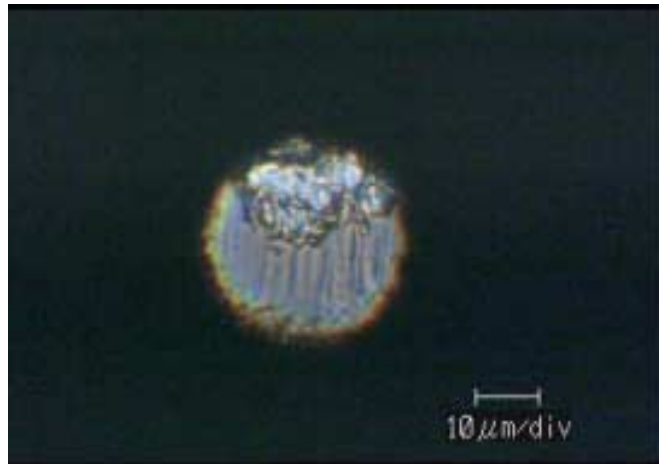
Clean Probe Before Test



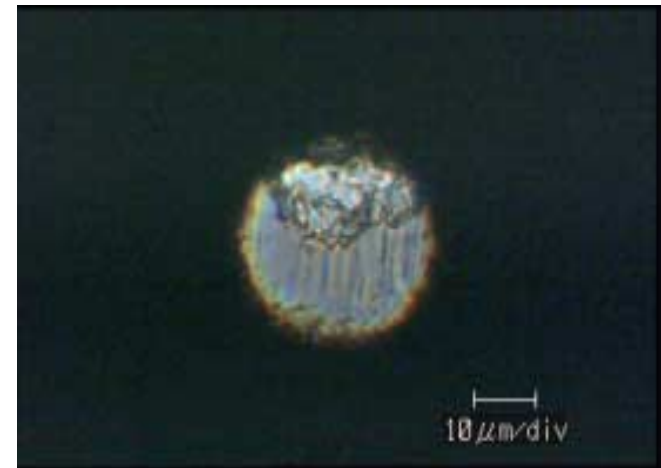
Contact 5000 times

Need for Aggressive Cleaning

Pictures Courtesy TSK



Cleaning 50Times Probe Clean



Cleaning 100 times Probe Clean

Debris Collection



Picture Courtesy TSK

14

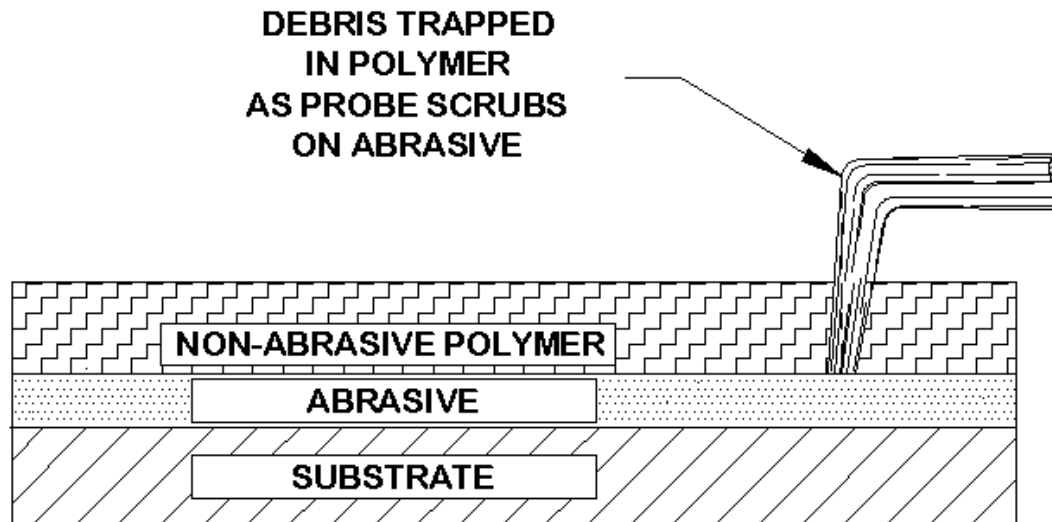
June 2000



Probe Scrub

- Light Abrasion
- Traps Debris
 - Reduces CRES for flat tip
 - Environmentally Safe
- Use with Flat Tip Probes

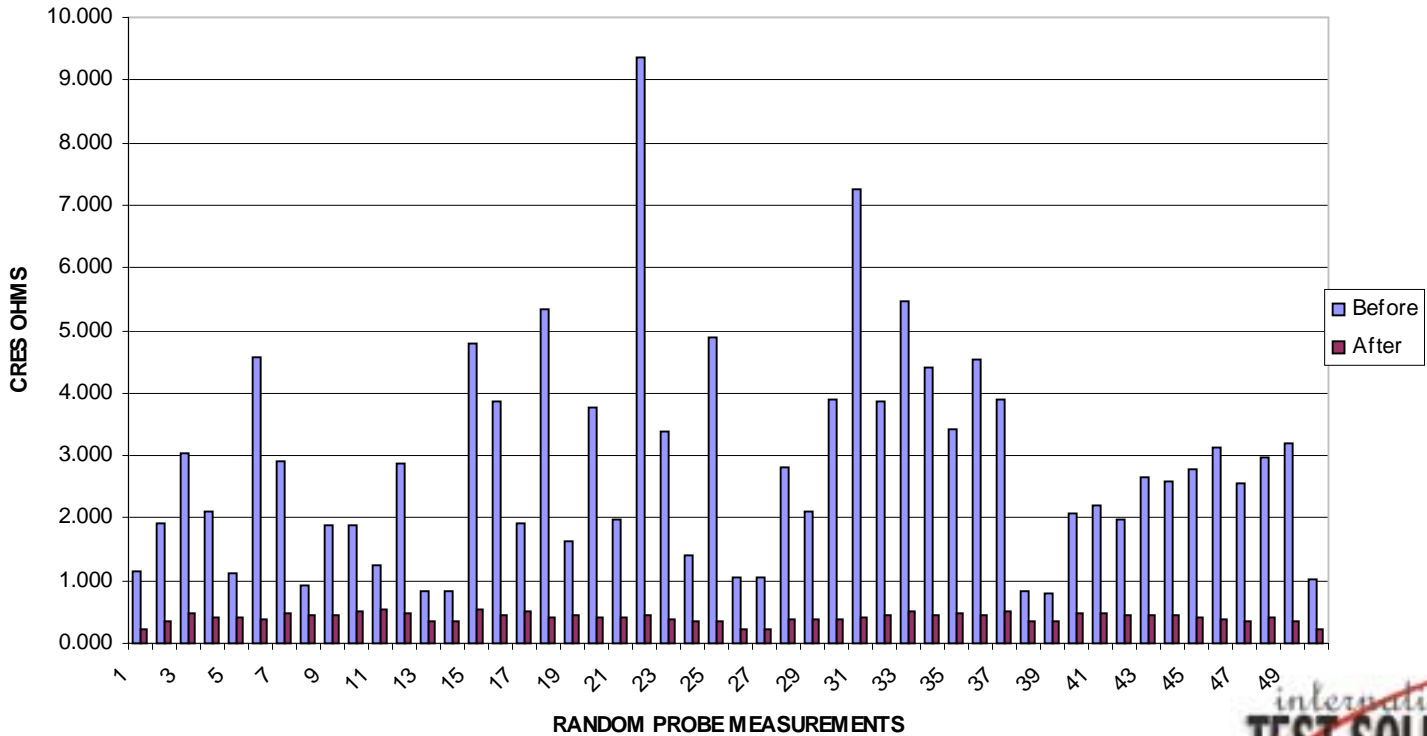
Probe Scrub



Probe Scrub Results

SV PROBE
API ANALYZER
20 OCT 99

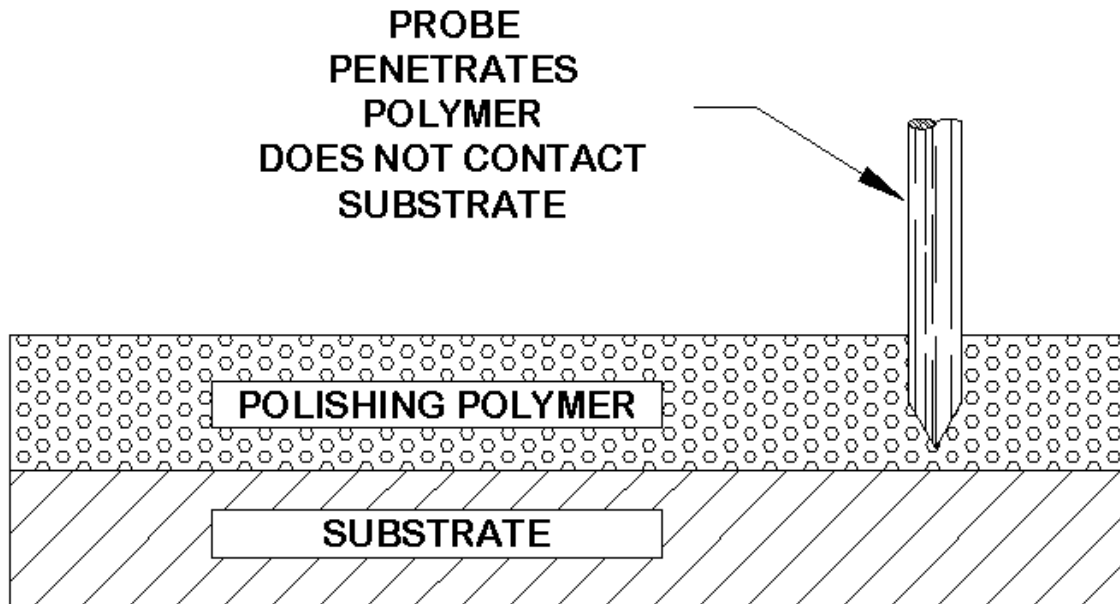
PROBE SCRUB TEST RESULTS



Probe Polish

- Reduces CRES by Lightly Polishing Probes
- Use with Flat, Rounded, Radius, Sharp Tip or Cobra Probes
- Removes Loose, Embedded and Bonded Debris
- Environmentally Safe
 - Collects Heavy Metal Residue
 - Traps Debris for Disposal

Probe Polish



Probe Polish Results

CUSTOMER DATA

Complete Cleaning Solution

- Several Cleaning Options
- Several Backing Materials
 - Polyester
 - Silicon Wafer
 - Ceramic
- Installs on Prober Abrasion Plate
- All Wafer Sizes for Prober Cleaning Trays

On-line Cleaning Benefits

- Increases Revenue
 - Increases Yield
 - Proven on Production Floors
 - Cuts Cycle Time – Increases Throughput
 - Reduces Off-Line Cleaning
 - Cost Effective
 - Cleaning is In-Line
 - Less Abrasive Cleaning Required
 - Extends Probe Card Life