

Southwest Test Workshop 2000

Controlling Pad Damage

June 13, 2000

Presented by:

Maverick Brown

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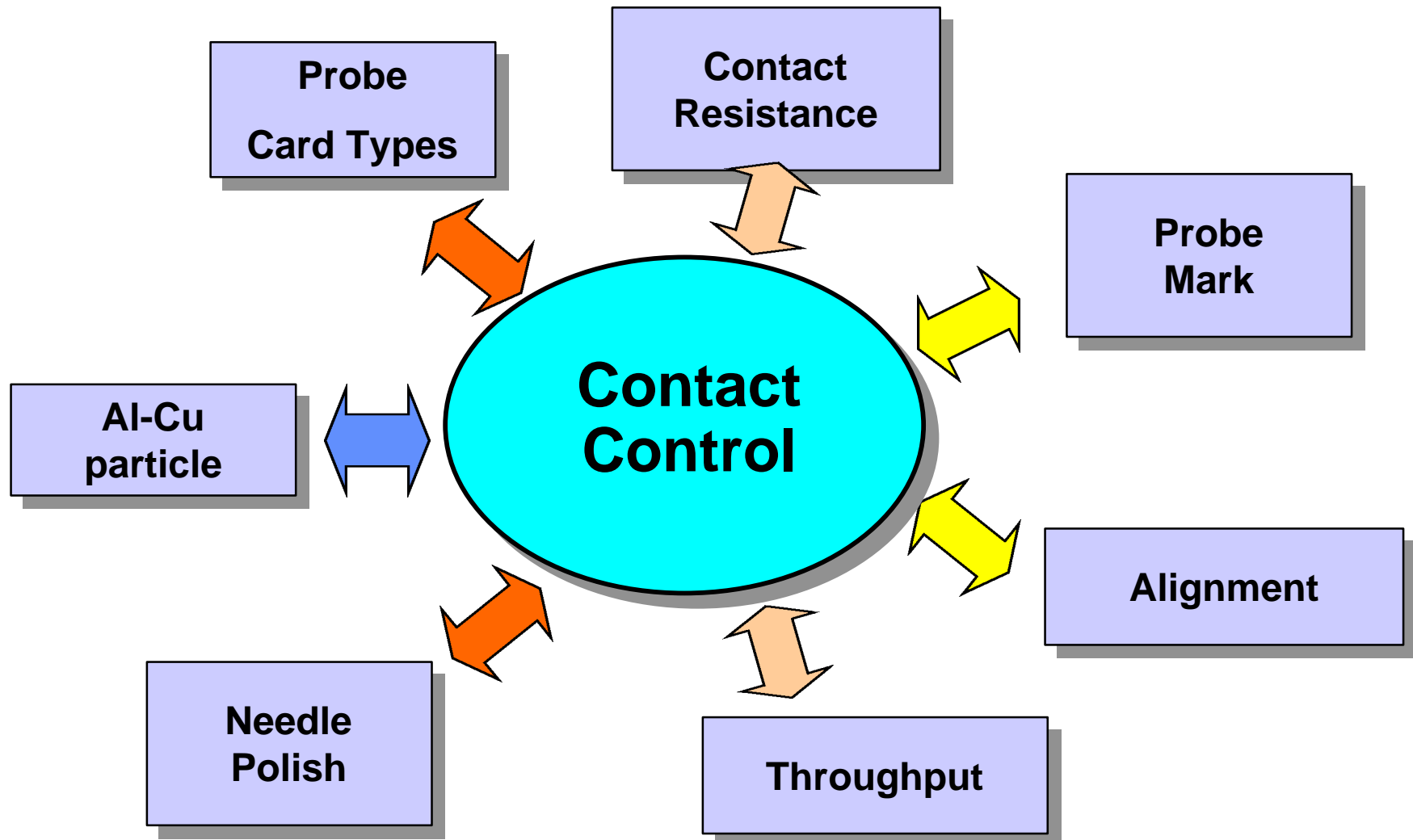
Tokyo Electron - Test Systems



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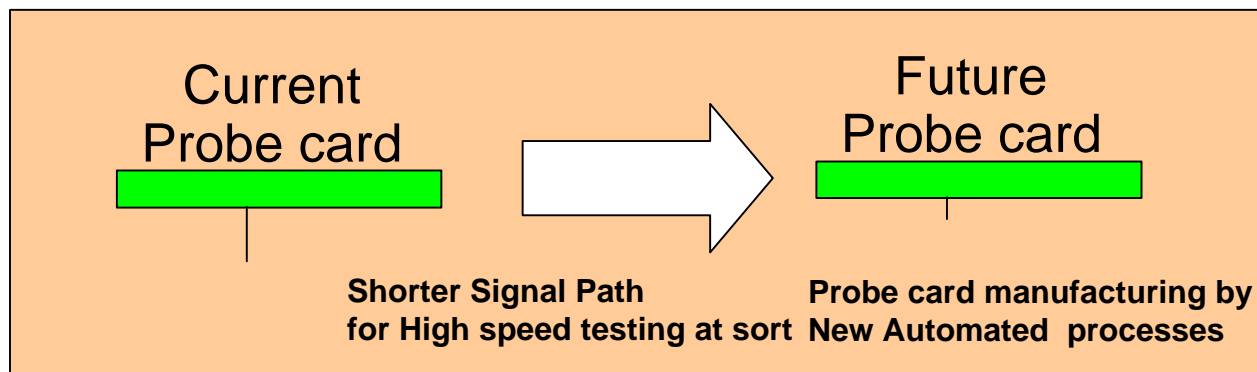
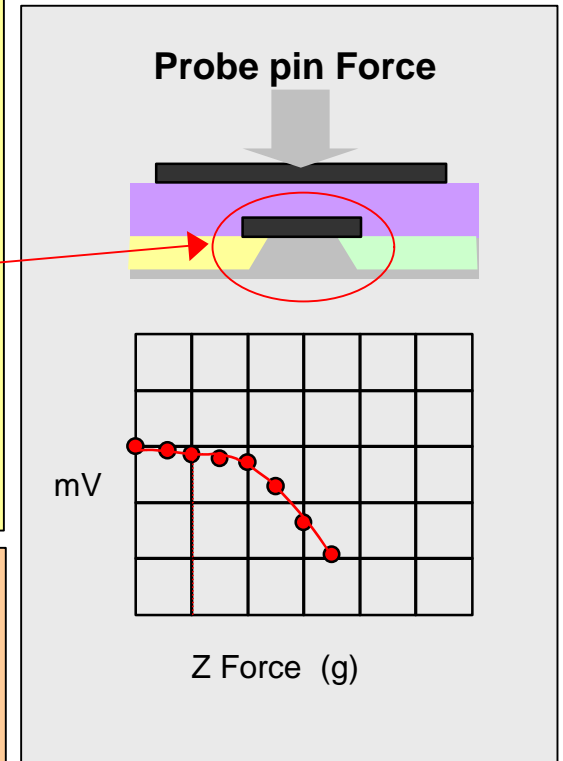
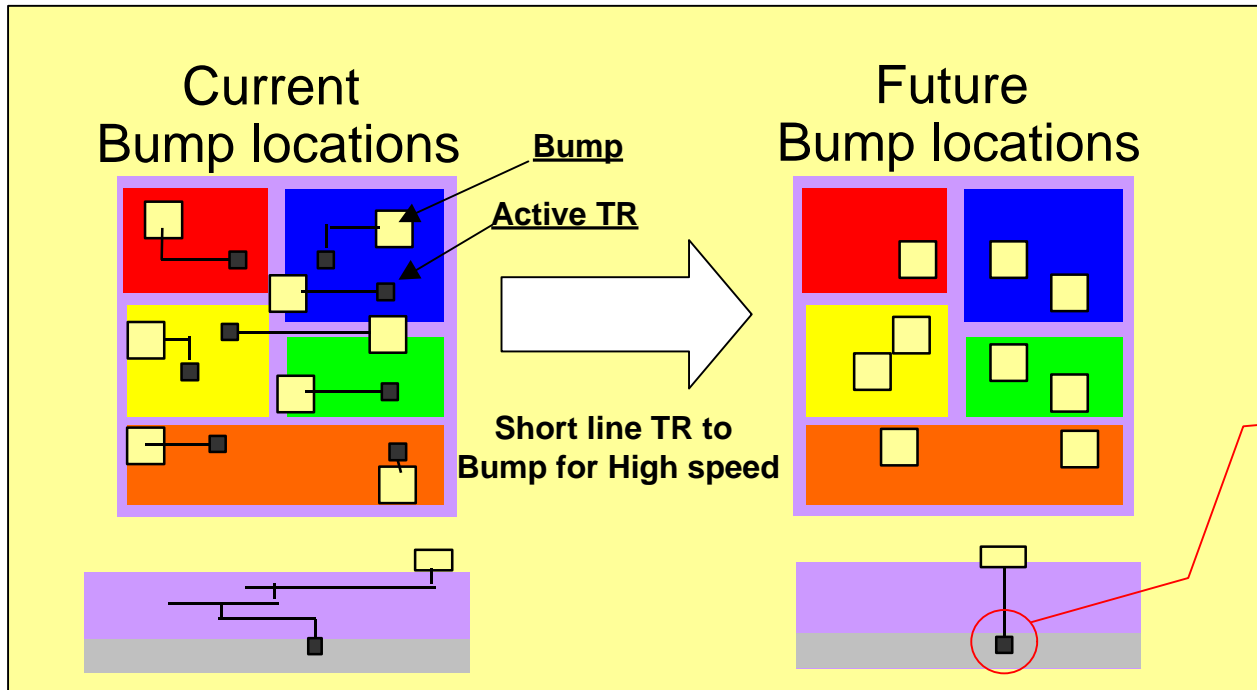
Contact Control Performance



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Device Trend (bump pad example)



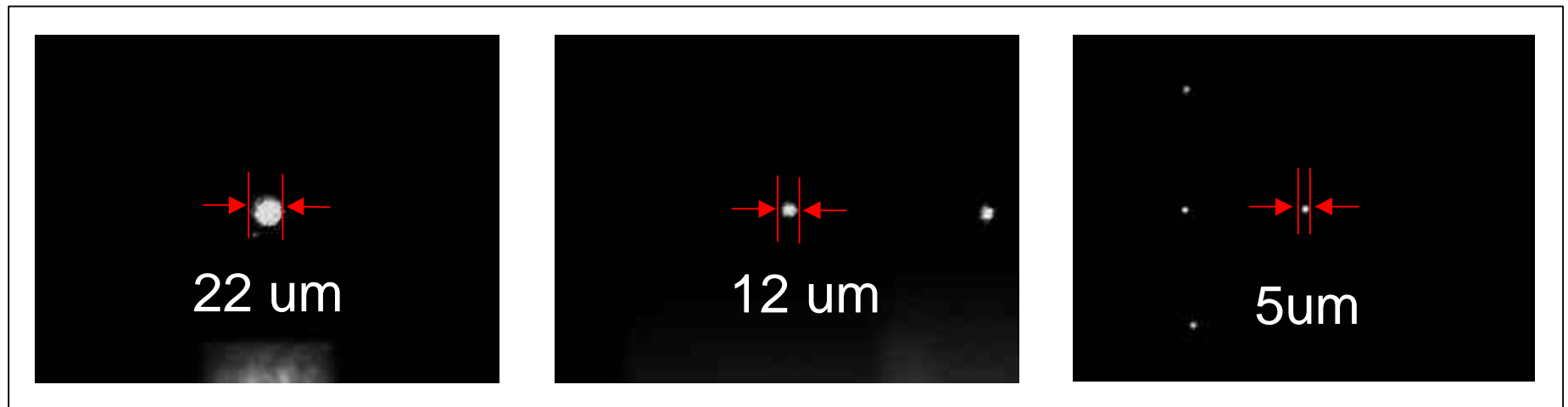
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Accurate Tip Recognition

Accurate Tip Recognition requires:

1. Various shape recognition is required
2. Lighting control for the tip diameter is required
3. Auto focus of Probe Tip to determine X, Y & Z Position (or electrical verification)



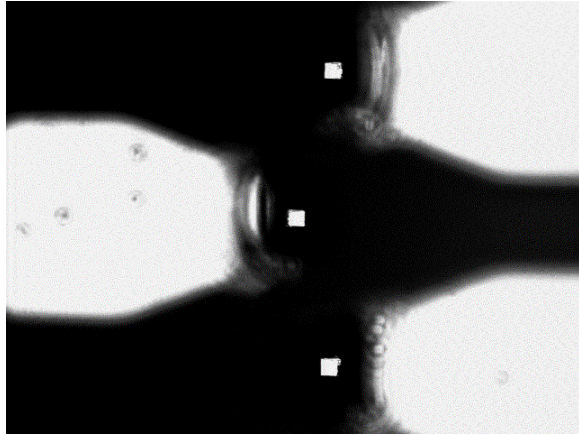
Example Probe Tip Size Trend



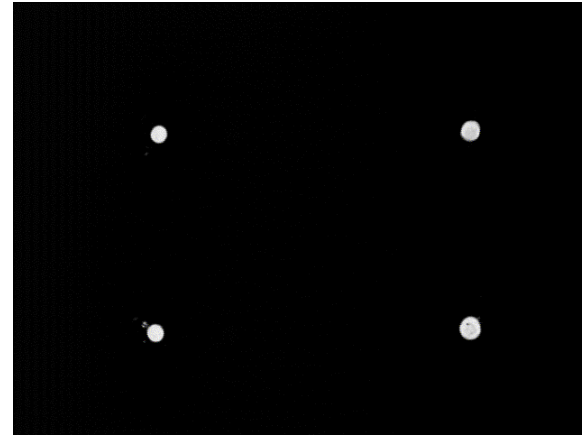
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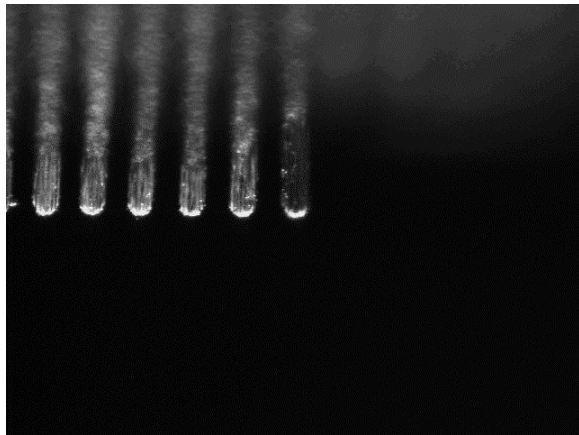
Probe Card Examples



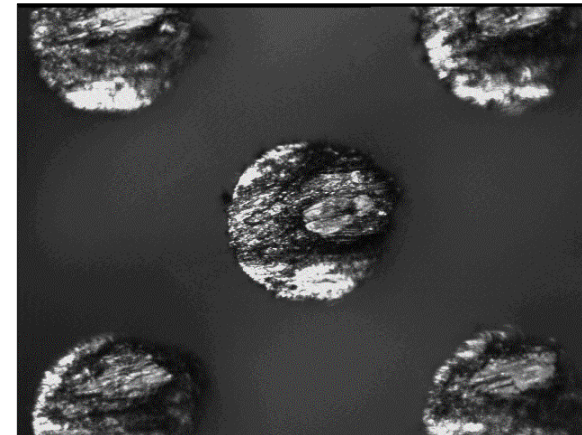
FFI



Wire



P4



C4 Cobra



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Controlling Pad Damage

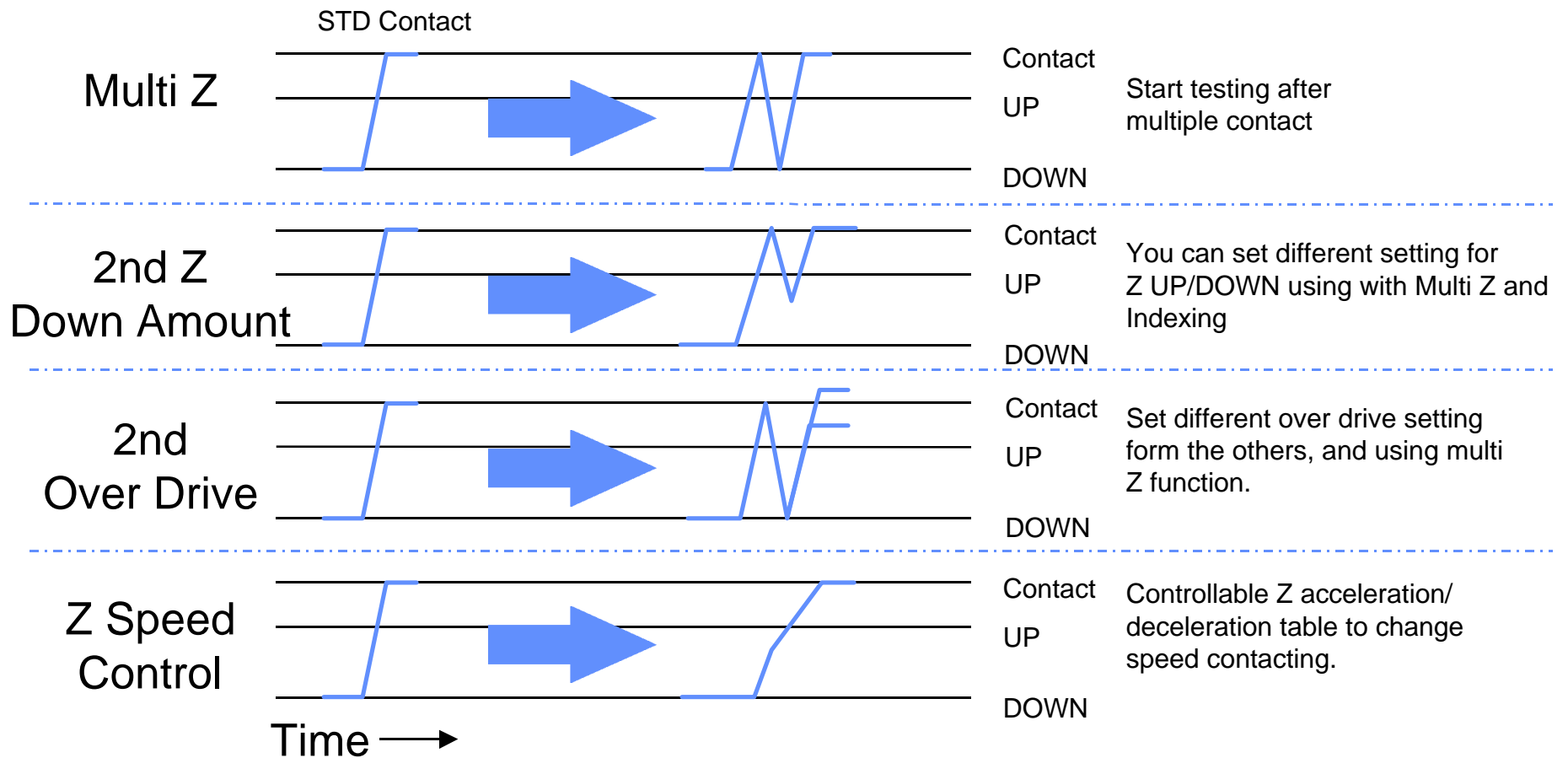
- ⌘ **Controlling Pad Damage can be accomplished by accurately controlling X, Y & Z position of the probe card.**
- ⌘ **Soft Contact Control is a greater control of X, Y & Z to reduce Pad Damage.**



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Z Control Examples



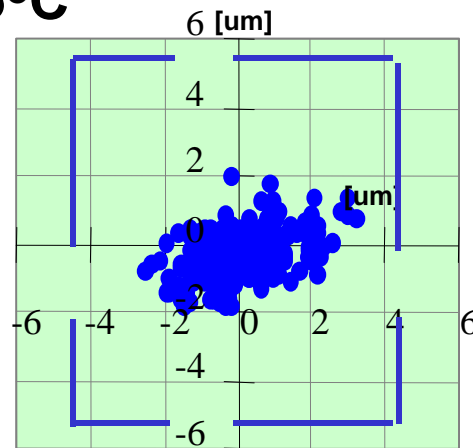
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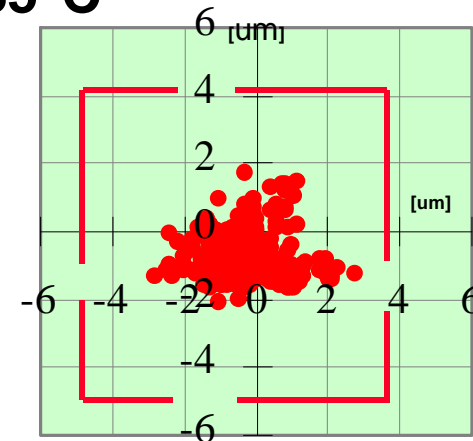
Accurate Probe to Pad Placement

Probe to Pad Repeatability should be $\pm 4\mu\text{m}$
(at any temperature)

25°C



85°C



TEL Probe to Pad Accuracy is guaranteed
Measurement by TEL CMS



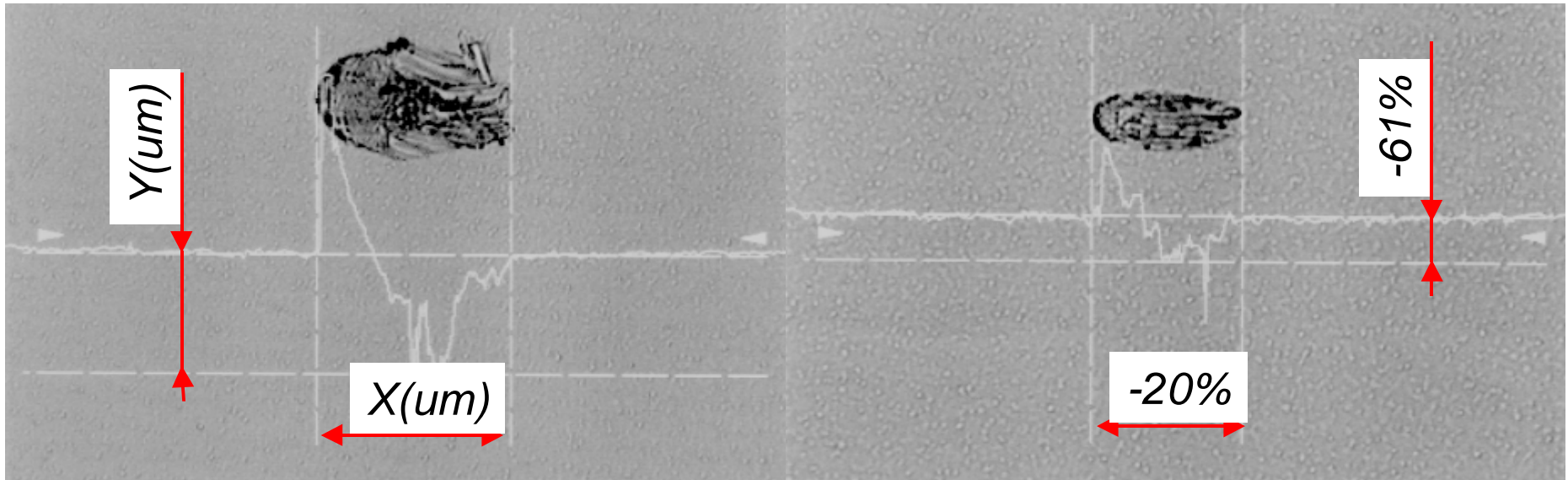
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The Shape & Depth of Probe Marks

Standard Contact

Soft Contact Control



WPC 80pin , OD=60um , on Al-Cu wafer

Minimal Pad Penetration and Probe Mark Volume



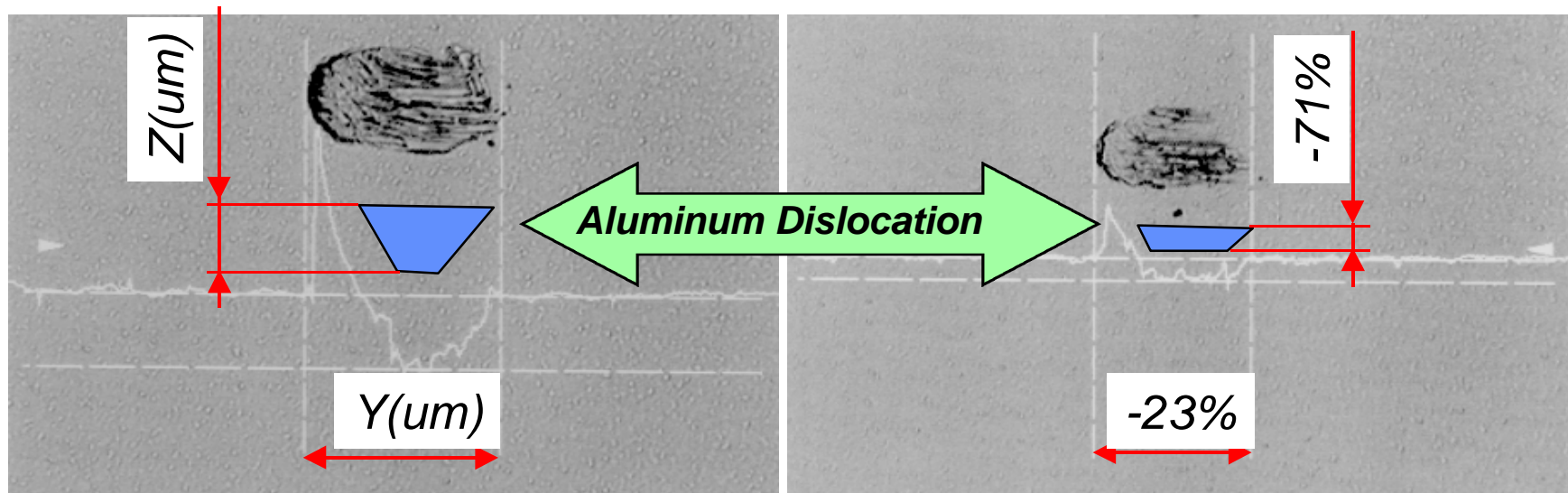
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Material Dislocation

Standard Contact

Soft Contact Control



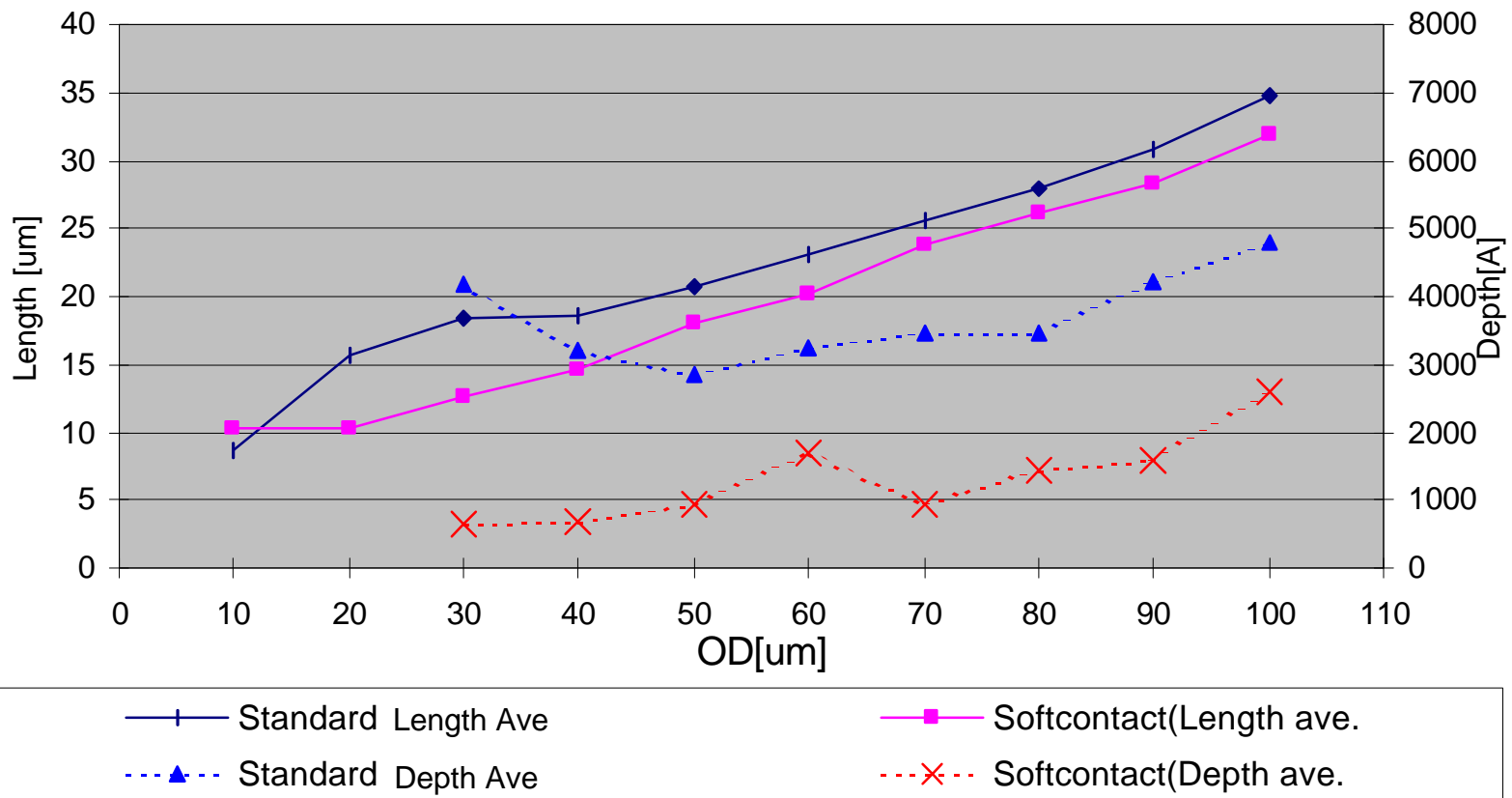
- Minimal Pad Penetration results in lower particle generation



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Standard vs Soft Contact

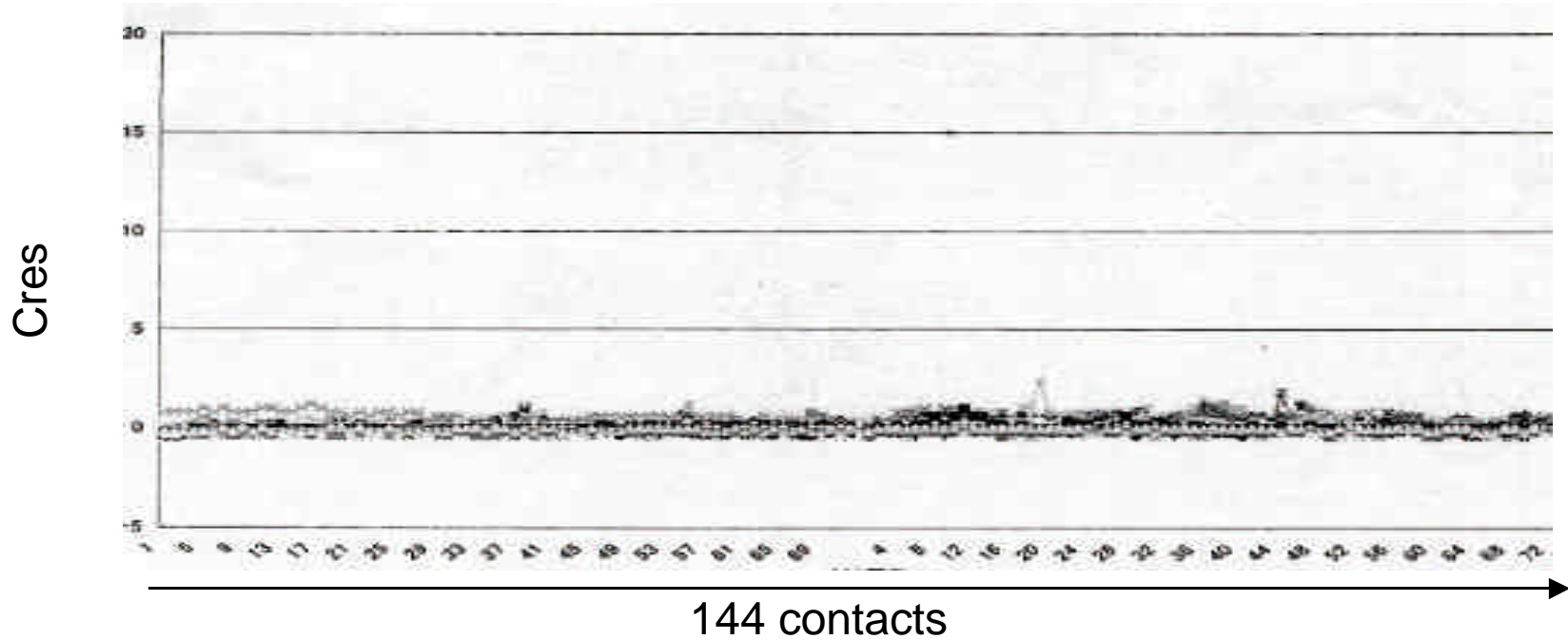


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Contact Resistance

Contact Resistance for Soft Contact Control is Stable



Cres

144 contacts



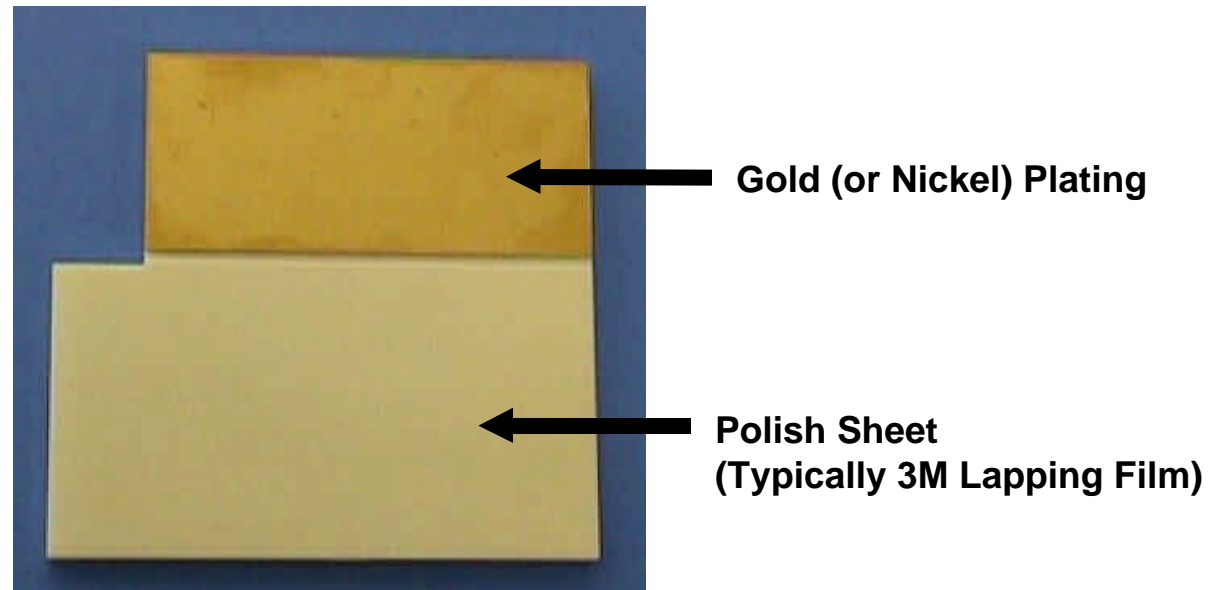
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Wide Area Polish Plate with Needle Continuity Area

Merit

- ◆ Eliminates the need for Polish Wafer and Dummy Wafer
- ◆ In-situ Continuity Checking ensures electrical location of needles
- ◆ Use is selectable by program interval or bin failure





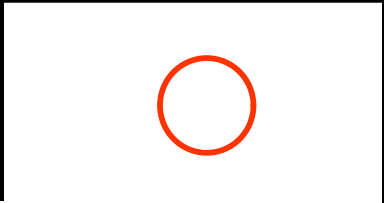
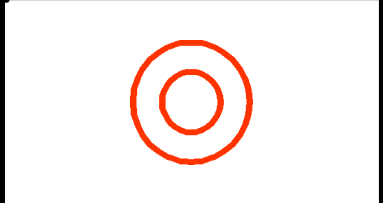
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Brush cleaning

Merit

- ◆ Enhances the Wide Area Polish Cleaning Method
- ◆ Low impact cleaning with various parameters

| Material | Original Organic | New Material |
|-----------------------|--|---|
| Photo |  |  |
| Bristle Cross-section |  |  |

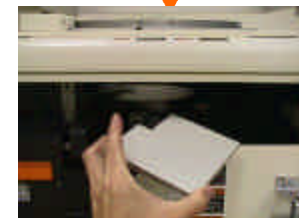


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WAPP Quick Exchange

Exchange from SACC cover (front of Prober) any time without undocking test head without adjusting of planarity



Extra WAPP Plate



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