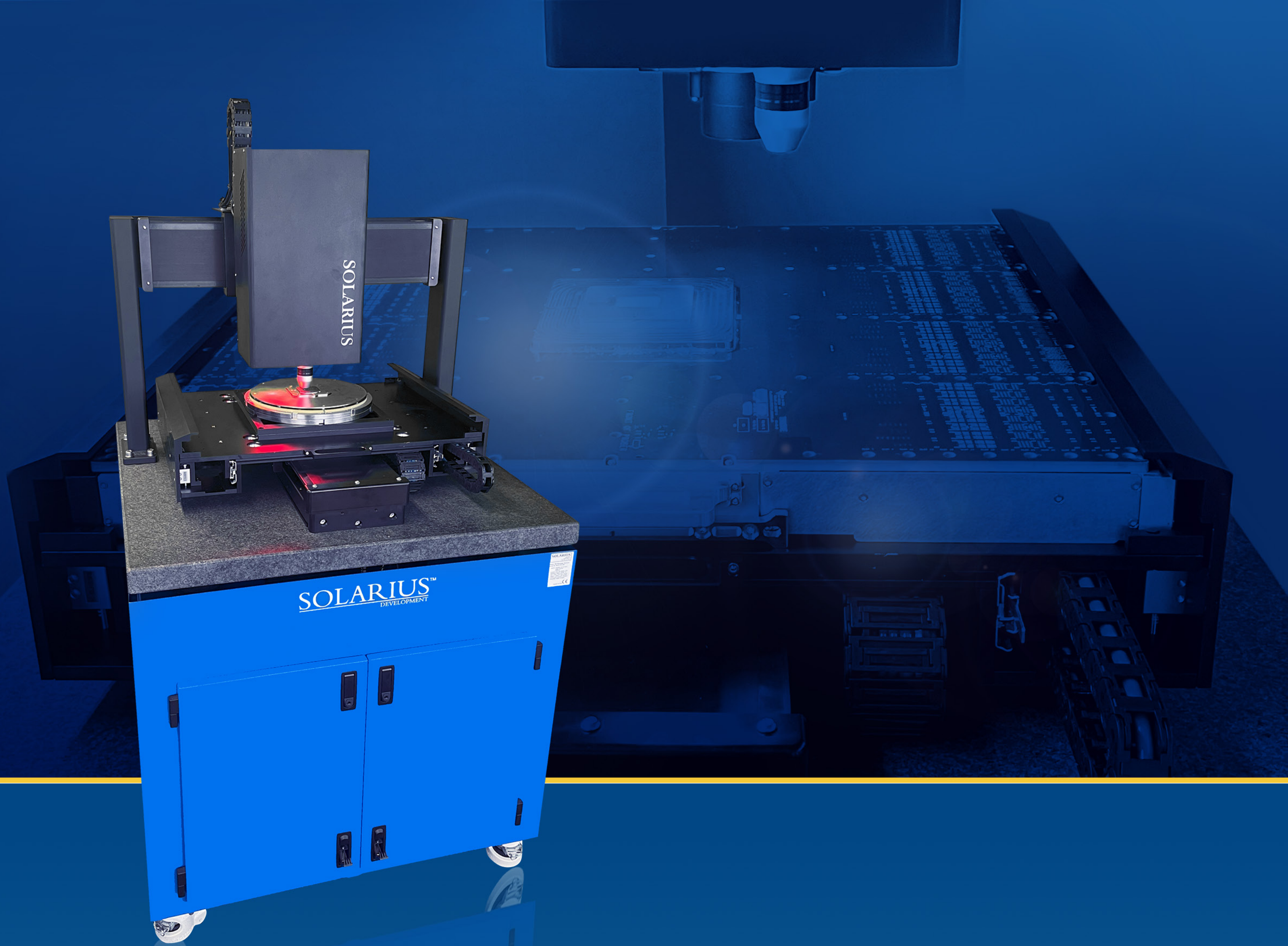


AOP Probe Card Inspection (PCI)

High-end 3D surface metrology

Accuracy and precision down to the nanometer for most demanding measuring tasks on complex surfaces

- **Highest optical and digital resolution**
- **Easy change over for handling different probe card types**
- **Fast cycle times for a quick feedback loop**
- **Easy setup with importing existing coordinate files**
- **Full SECS/GEM integration and E84 compliance (optional)**
- **Probemark Inspection (optional)**

SOLARIUS
THE VISION OF QUALITY

AOP-PCI

Wafer Probing is the last QC operation at the back end of line (BEOL) and the probe card quality and state has a big impact on the wafer test results. Faulty pins (beams), bend probe heads and objects within the probe card clearance can negatively affect the wafer test or even bring damage to an already tested wafer.

In order to easily measure the state of a probe card and to finally mechanically release a probe card for wafer test, SOLARIUS has developed a probe card inspection tool.

The AOP-PCI (Probe Card Inspection) is a multi-function, non-contact, non-destructive inspection tool for a holistic probe card checkup. Combining the air bearing stages with state of the art sensor and vision systems, we can acquire high precision data of the probe card tips, head geometry and PCB surfaces even for full sized square direct dock probe cards.

In addition, our dedicated measurement algorithm can seamlessly run routine for both Data Acquisition and Analysis.

Typical **Applications**

Probe Tip/Pin Inspection

- Height
- Diameter
- Misalignment
- Presence
- Debris/particle
- Coplanarity
- Damaged
- Tilt

Probe Head Inspection - Loose/Missing Screws

- Contour
- Geometry
- Debris/particle
- Defect/damage detection

PCB Inspection

- Geometry
- Missing components
- Coplanarity
- Debris/particle
- Defects

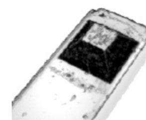
Probe Mark Inspection

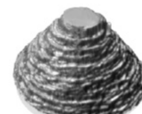
- Depth
- Position
- Pad Edge Damage
- Geometry
- Particle

Software Feature

The Solarius SolarCore software platform is designed according to SEMI standards, guiding engineers and operators through individual workflows in different languages. Besides the standards, a configurable user and role management allows granular access control. Data import and export is possible via templating file names and folder paths, using data from automated RFID, QR and DDM code recognition. Especially for wafer test, data import will allow to use meta information, such as signal names, in the result UI. Handling the probe cards in fully integrated fab environments with OHT or AGV is supported by the SECS/GEM E84 via the platform interface toolbox

Pin Type Example


13 µm MEMS

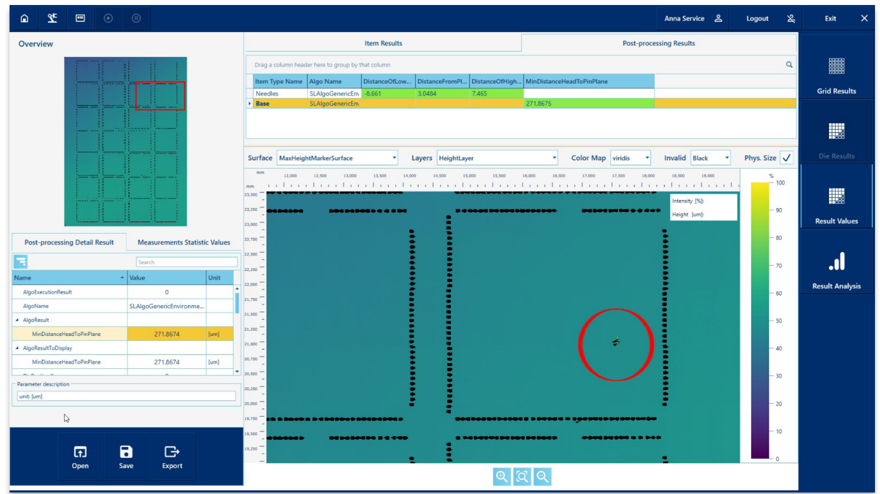

10 µm vertical

30 µm POGO

80 µm cantilever

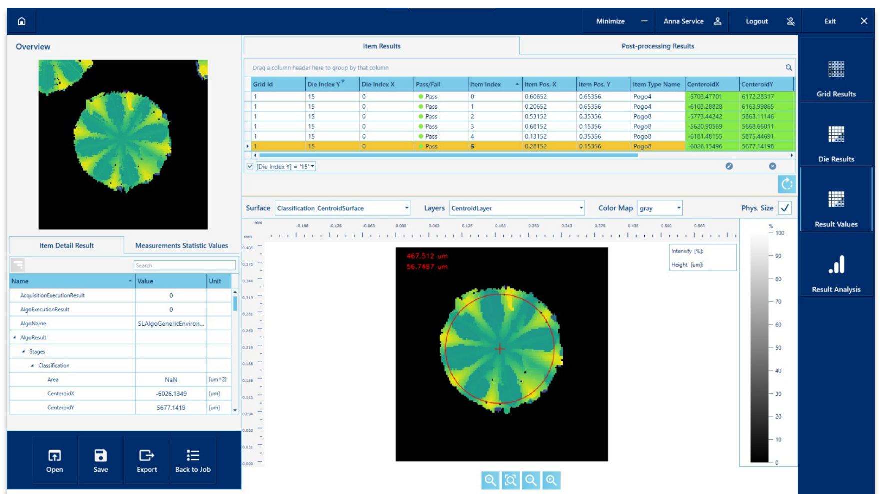
Probe Head Inspection

The structural integrity of probe heads is essential to avoid quality issues during the probing process. Unwanted objects, such as particles or loosened screws penetrating the clearance may lead to imprints on the wafers which, in worst case, stay unnoticed. At the same time, tilted or warped probe heads may lead to a physical contact between the probe head and the wafer causing damage at the wafer while electrical test parameters still stay in a valid range. Maintenance of probe card conditions allows safe probing operations and avoid expensive QA issues.



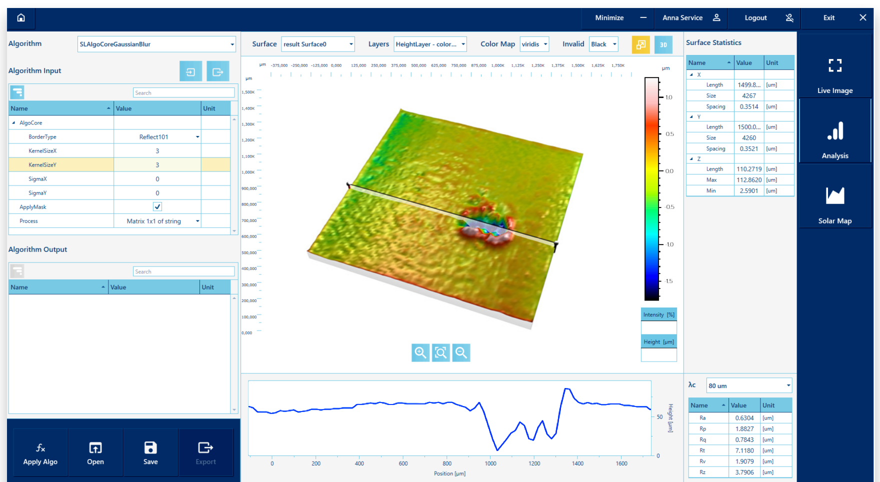
Probe Tip Inspection

Probe tip inspection is another important function to avoid QA issues caused by bent or misplaced tips. For example thin tip diameters used with new probe cards can damage contact pads. In addition to QA issues, periodic maintenance of probe tips extends probe card lifetime and allows single tip repairs.



Probe Mark Inspection

In addition to inspecting probe card head and tip, also probe mark inspection contributes to assess the condition of probe tips and the probe head to tip alignment. Probe mark is a direct effect of applied force and direction so, together with tip and the head inspection, a periodic maintenance extends probe card lifetime and allows single tip repairs.



Technical data **AOP-PCI**

Specification

Resolution	Lateral Resolution: 1 µm up, Vertical Resolution 1 nm up.
Scan speed	Processing time 30 x 30 mm probe tip array: < 4 mins (high res) Processing time 80 x 80 mm probe head geometry: < 3 mins (low res)
Dimensions	Built to Order
Change over time (between different probe card types): less than 2 mins	

Application

Measurement of	Coplanarity Probe tips vs. Head vs. Stiffener/PCB Probetip shape, position, presence PCB components presence Loose/missing screws, particles, debris
Manual optical inspection through high resolution camera	

Features

Probemark Inspection (optional)	
SECS/GEM Interface	E4, E5, E30, E37, E39, E40, E87, E90, E94, E116, E84 AMHS
OHT probecard handling	
Probecard sizes	All existing tester interfaces (e.g. J750, V93k, Mflex, etc.)

Incredibly fast **3D inspection** makes AOP-PCI unrivaled in price, accuracy, and speed

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