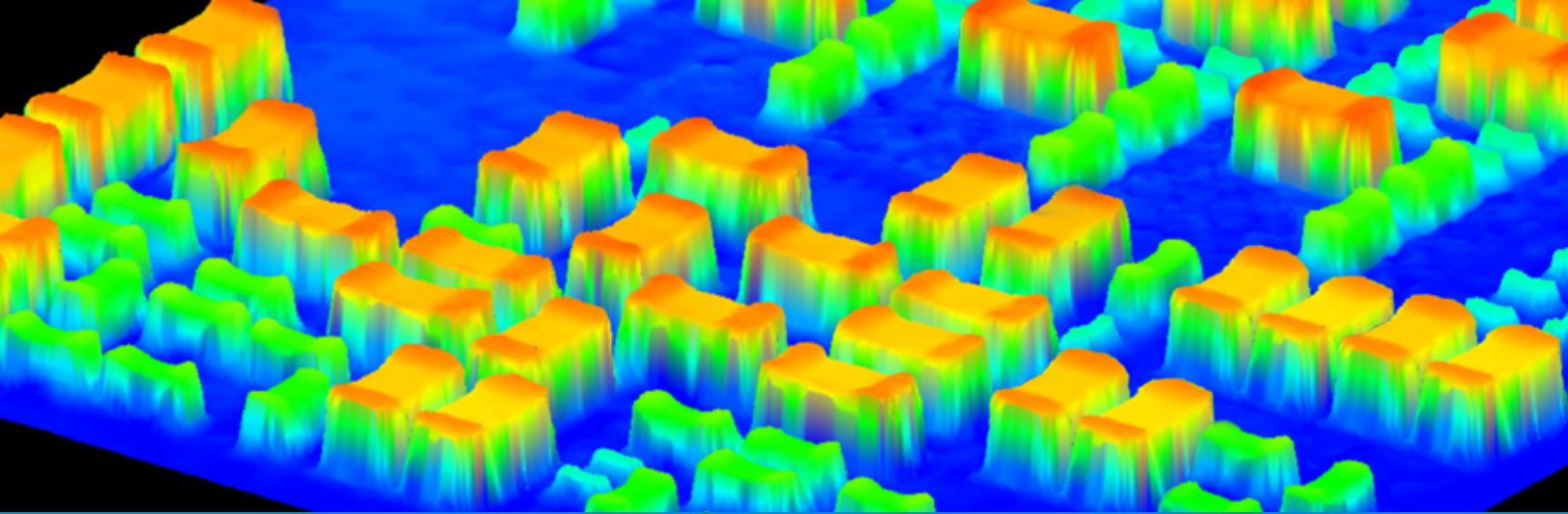




# Success Story – Wafer and PCB applications with SQ7000+ Multi-Function System for AOI, SPI and CMM

Application Story

## Type of Customer

Our customer is a multi-billion dollars provider of electronic design and test solutions to commercial communications, networking, aerospace, defense and government, automotive, energy, semiconductor, electronic and education industries.

## Our Customer's Requirements

A high-performing inspection and metrology solution with high accuracy and high resolution was needed. The system needed to perform AOI, SPI and CMM (Coordinate Measurement Machine capabilities) to address the following requirements:

### SPI Criteria

- **Wafers:** highly reflective, mirror, and translucent with thick dielectric, 3-inch & 8-inch diameters with solder paste deposits of package types 01005, 0201, 0402 & QFNs etc.
- **PCBs:** 18 (L) x 12(W) inches & smaller, possible in future with solder paste deposits of package types 01005, 0201, 0402 & QFNs, BGAs, QFPs etc.
- **Inspection needs:** Inspect solder paste volume, area, and height of following deposits size:
  - Printed or Jetted SP diameter:  $210\mu\text{m} \pm 30\mu\text{m}$  with Gauge R&R  $\leq 10\%$
  - Min Printed or Jetted SP height:  $75\mu\text{m} \pm 15\mu\text{m}$  with Gauge R&R  $\leq 10\%$

### AOI Criteria

- **Wafers:** highly reflective, mirror, and translucent with thick dielectric, 3-inch & 8-inch diameters with different package sizes (01005s, 0201s, 0402s, SOTs, QFPs, BGAs, Connectors, etc.) as small as 01005s SAE
- **PCBs:** 16 x 12 inches & smaller, possible in future with different package sizes (01005s, 0201s, 0402s, SOTs, QFPs, BGAs, Connectors etc.) as small as 10015s SAE
- **Inspection needs:** insufficient solder volume, excessive solder volume, solder bridging or shorts, open solder joints, lifted or misaligned leads, tombstoning, components misalignment & missing, extra placements/double placements, coplanarity issues, component dimensional requirements, tilt and rotate, lifted pads, warpage, foreign object or debris, solder balls & markings @  $\leq 6.63/3\sigma$  false calls rate

### CMM Criteria

- **Measurements:** XY offset of solder paste deposits to a certain datum, and measure the height/coplanarity of the paste deposits relative to one another, among other coordinate measurement applications

# Wafer and PCB applications with SQ7000+ Multi-Function System for AOI, SPI and CMM

Application Story

## Drawbacks of Alternate Solutions Evaluated

Alternative inspection systems fell short in terms of overall system performance for resolution and accuracy, and they lacked CMM capability.

Traditional CMM software, while comprehensive, was not the best solution and the systems were much more expensive and would add 1 more machine. The traditional CMMs were also too slow; programming took too long, as did operator training. Additionally, CMM machines require repeated adjustments to lighting, focus, illumination angle, and other parameters requiring a major investment in engineering resources and time.

## Our Solution

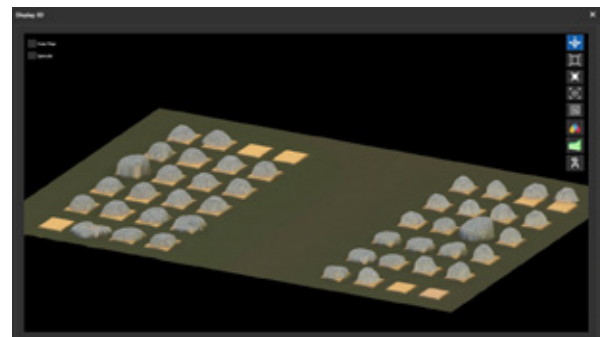
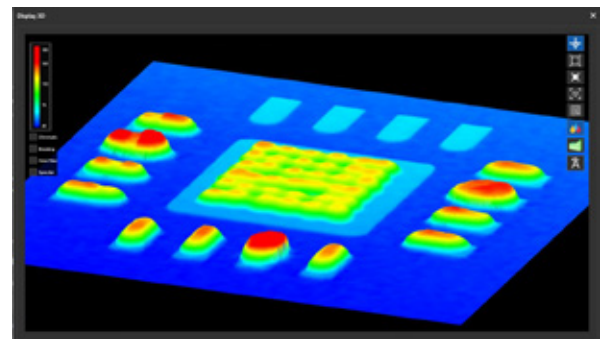
The Nordson SQ7000™+ [Multi-Function System for AOI, SPI and CMM](#) powered by proprietary Multi-Reflection Suppression (MRS) 3D sensor technology and advanced measurement algorithms, was deemed the best fit for our customer's needs after an extensive competitive evaluation. The 5 micron [ultra-high resolution MRS sensor technology](#) mitigates reflection-based distortions on shiny and specular surfaces, delivering [superior image quality](#).

## The Result

The SQ7000+ [met and exceeded](#) their acceptance criteria on the types of samples and applications the customer identified.

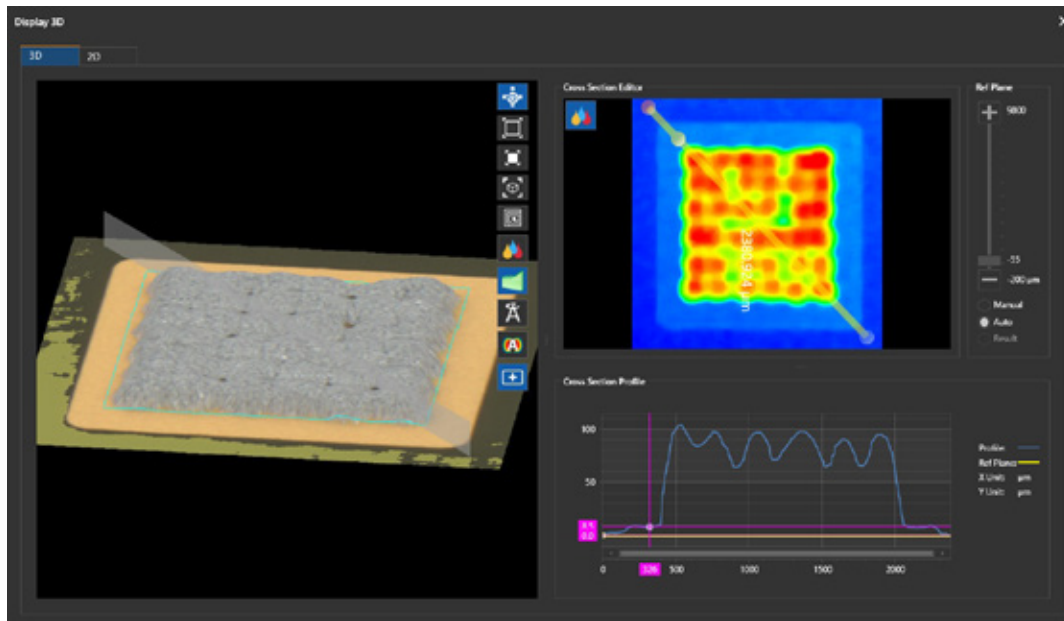
Overall, our customer chose the SQ7000+ based on the [superior performance](#) and unique [multi-functionality for AOI, SPI and CMM](#) to conduct both inspection and measurements for wafer and PCB applications that involve small packages, small solder paste deposits and shiny, reflective surfaces.

After a demonstration running their samples on our system, they were impressed with our [advanced CMM capabilities in a relatively low-cost tool](#), compared to other expensive metrology devices that offer some similar features. The [software's flexibility and accuracy](#) were determined to be superior to competitive alternatives and [coordinate measurements can be attained in seconds](#), not hours or longer with alternative CMM solutions.



Solder paste examples

# Wafer and PCB applications with SQ7000+ Multi-Function System for AOI, SPI and CMM Application Story



Coordinate measurement captured by CyberCMM software

The [ease of programming](#) with ePM AI was also an important factor as they use ODB++ files.

Additionally, the SQ7000+ is [capable of supporting their larger board sizes](#), and the [maximum 3D](#) component height requirement that the 5 micron MRS sensor is capable of 3D modeling, addressed their requirements. Lastly, the system delivers on the customer's [GR&R](#) requirements.

The system remains the only system capable of conducting AOI, SPI and CMM in-line, and is also ideal for off-line and NPI applications.

For more information on Nordson Test and Inspection products, services, or solutions, visit our website at [www.nordson.com/TestInspect](http://www.nordson.com/TestInspect)

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