

SUCCESS STORY

Worthington Assembly, Inc. partners with Omron Inspection Systems to enhance quality focus amid business expansion



Worthington

Worthington Assembly
Electronics Manufacturing
South Deerfield, MA
worthingtonassembly.com



**Reduction in
post-reflow defects**



**Improved
personnel training**



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Key Benefits

1

Reduction in post-reflow defects.
Omron's 3D SPI technology helped WAI stabilize the print process.

2

Faster delivery of quality product.
Omron's advanced 3D AOI system helped WAI deliver zero-defect boards to customers much faster

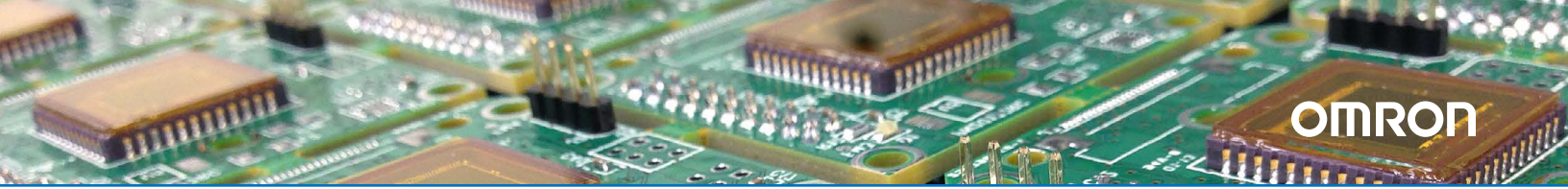
3

Dramatic reduction in training requirements. WAI only needs to show employees how to load SPI programs after printing boards, letting the machine automate the rest of the process.

At a Glance

For manufacturers of electronic PCBAs that support end products in medical, digital, aerospace, and other industries, tolerating even the slightest defect is not an option. These companies must invest in the most advanced, reliable, and efficient quality control systems that automation can provide.

To address these challenges, South Deerfield, MA-based Worthington Assembly, Inc., (WAI) embarked upon an intensive project to identify and team up with the right technology and solutions partner for its inspection needs. The resulting partnership with Omron Inspection Systems, and the incorporation of Omron's 3D AOI and 3D SPI equipment, dramatically improved production quality and made training easier.



Addressing the challenges that result from rapid business growth

Worthington Assembly traces its roots back to 1974. By focusing on developing a talented and adept workforce, the manufacturer has discovered its unique value in the industry as a dynamic and flexible business that delivers quality products to an ever-growing list of loyal customers. WAI prides itself on fast turnaround times for small-volume prototype and production runs of the most complex designs and places great importance on catching and preventing any potential defect.

Thanks to its ability to accommodate complex customer demands, WAI achieved rapid business growth. This led to issues with finding, hiring, and training skilled inspectors, as well as a need for updated equipment, to maintain a fast and effective inspection process. Like many manufacturers, WAI also had challenges with some equipment suppliers due to a lack of innovation, broken promises, poor communication, and unreliable engineering support.

Investing in a partnership, not just new technology

To meet growing demand while maintaining quality standards, WAI decided to invest in more capable 3D automated optical inspection (AOI) equipment to replace its 2D AOI machine and incorporate 3D solder paste inspection (SPI) into the process for the first time. Beyond this, however, the company saw tremendous value in teaming up with a trusted inspection solution partner to oversee the integration of this new equipment.

Picking the best inspection solution partner meant selecting one with not only top-notch technology and capabilities, but a top support team as well. Given that WAI would probably be experiencing some growing pains due to the learning curve associated with introducing new technology, having

support from knowledgeable experts was critical to its continued success in a highly competitive industry.

WAI turned to industrial automation solutions provider Omron Inspection Systems for both 3D SPI and 3D AOI. Omron shared WAI's commitment to quality while providing the best all-around value comprising ease of use for equipment and software, exceptional inspection capability, excellent cost-competitiveness, and professionalism as a supplier.

A thorough evaluation process for state-of-the-art inspection solutions

WAI recognized that its existing 2D AOI technology had severe inspection limitations, such as a lack of any real ability to catch potential defects on critical BGA devices. The inspection process has become labor-intense due to a complete reliance on inspectors to catch defects. When operators failed to catch defects, defective products would sometimes be released, and a customer might experience intermittent failures.

3D SPI is ideal technology to prevent this type of incident from happening. WAI implemented the Omron VP5200-V 3D SPI system first, since it was seen as an easier, lower-risk application for the purpose of evaluating the inspection partner's technology and culture. The VP5200-V performs high-speed, high-accuracy inspection with speeds that reach 9,400mm²/sec., height measurements within 1µm, and volume measurements within 2%. WAI also paid great attention to Omron's ease of use and supplier capabilities.

The VP-V series 3D SPI is designed with a dual-stage resolution, allowing the programmer to ideally balance speed and capability to meet the needs of today's more dynamic manufacturing environments. This approach allows the same system to support both fine pad inspection and production throughput demands. Specialized illumination and

a mechanical Z-axis further enhance stability and flexibility. A fully interactive, touch panel interface simplifies the operation process.

WAI was pleased with Omron's knowledge and competency, especially with respect to knowing how to successfully implement new inspection technology into existing operations. Initial results that demonstrated the ROI of the SPI system were excellent, and WAI could tell right away that the types of defects they had experienced post-reflow were no longer related to their stencil printing operation. The company was also very impressed with how quick and easy it was to learn and use 3D SPI. The success of the SPI machine was readily apparent, and WAI was emboldened to proceed with the 3D AOI project.

Omron 3D AOI is specifically designed to improve inspection capability and performance stability versus legacy 2D and colored-based systems. It enhances defect detection of difficult issues like solder wetting, lifted lead and component coplanarity while collecting valuable measurement and image data to further improve the process and prevent defects from reoccurring. Applying a 3D-based, IPC-correlated approach to component and solder joint inspection with quantifiable measurement thresholds is the best means to improve the quality assurance and process control of assembled PCBs.

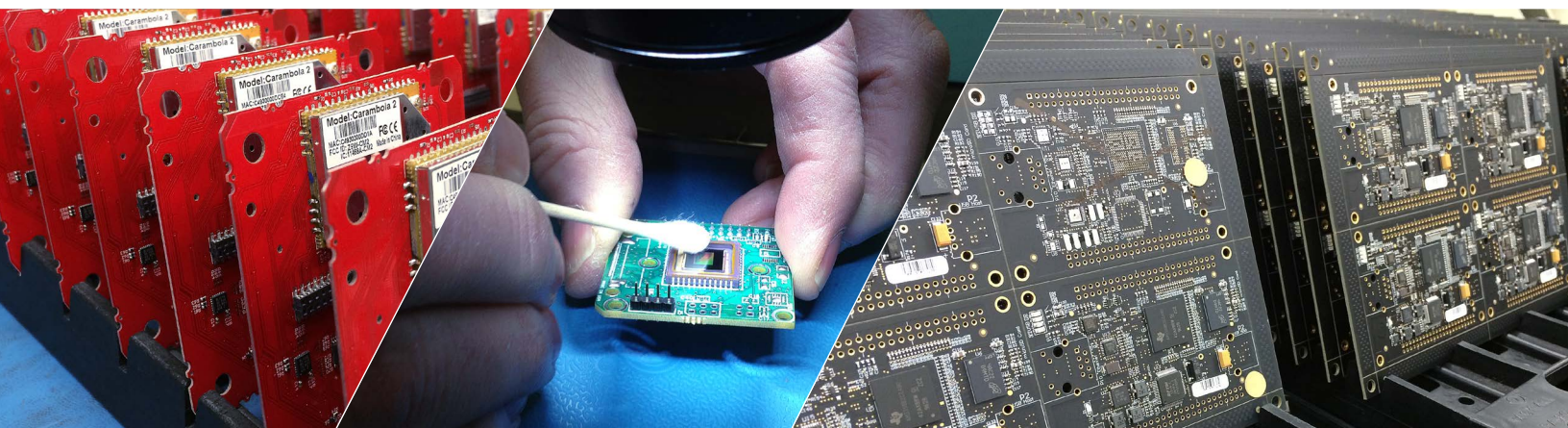
Omron implemented the VT-S730 3D AOI system to address WAI's post-reflow inspection requirements.

The VT-S730 integrates Omron's advanced 3D Color-Highlight™ illumination with true 3D, DLP imaging technology and five optical cameras to achieve 100% inspection coverage of every part and every solder joint. Omron hardware delivers reliable operation, and Omron's unique and sophisticated inspection capabilities ensures that products are built to high-quality standards and perform as designed.

WAI's evaluation process included running every product through the new 3D AOI, existing 2D AOI and a manual QC process to determine effectiveness. After many weeks of putting the VT-S730 to test, not a single defect escape was identified. Next, WAI introduced and trained a second programmer who was able to achieve the same results and without any impact to effectiveness.

A huge boost for both quality and training

WAI has effectively reduced post-reflow defects by incorporating 3D SPI to improve and stabilize the print process and verify that any print issues were due to human error and not the automated printing process. The manufacturer is continuing with its desired internal process of 100% 3D AOI inspection with occasional QC sampling. With an understanding of how to successfully utilize 3D AOI, WAI has gained true confidence in its new technology, inspection process and therefore its deliverable product quality as well.





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3D SPI even significantly improved the time it takes to train new personnel on printing boards. Previously, they needed to teach employees how to both print and inspect boards, but now they only need to show them how to load SPI programs after printing boards and let the machines automate the rest of the process. This became enormously valuable when resource challenges grew during the pandemic and the company needed to cross-train and shift people around to keep production running on schedule.

With Omron's advanced 3D AOI system, WAI is able to deliver zero-defect boards to customers much faster. In the long term, WAI's investment into advanced inspection technology will help maintain its competitive edge and have the capabilities necessary to support the ever-growing sophistication and variety of customer products.

Future plans with Omron for the evolution of WAI's business

As WAI's business continues to grow, company leaders expect to incorporate more Omron systems to help keep pace with demand and ensure product quality. They are confident that Omron will be there to make these next projects equally successful, given the continuous and attentive support that Omron has shown.

At every step of this project, Omron has proven to be a very supportive and reliable partner. WAI works to harness the full capabilities of any new technology it adopts so that it can optimize this technology to meet its unique needs. For this reason, the in-house engineering team tends to lean heavily on the supplier's knowledge and experience for efficiency and improvements. Each time WAI engineers have reached out to Omron for help and advice, they have had a great experience and have received quality technical support.

WAI has also dedicated an entire episode of its popular podcast "Pick, Place, Podcast" to the subject of AOI. This podcast is intended for audiences that are not familiar with AOI and who would like to learn more about the process of assembling circuit boards. In the future, WAI hopes to continue expanding its podcast's range of topics to discuss more inspection, including Omron's 3D CT AXI system.

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