



Real Yield Improvements with Pre-reflow AOI

By Brent Fischthal, Senior Marketing Manager, Koh Young America

The more we inspect, the higher our yield, it's that simple. Well perhaps it's not that simple, but it seems that the addition of another inspection step in the middle of the SMT process can be a game changer if the experience of U.S. EMS company Matric Group is anything to go by.

Located in Northwestern Pennsylvania, Matric was founded in 1971 by two electrical engineers turned Vo-Tech teachers interested in designing, building, and servicing HAM radio equipment. Their portfolio expanded into rugged control systems specifically for the mining industry. Today, Matric provides world-class Electronic Manufacturing Services (EMS) with personalized customer support. They offer both turnkey and board-level assembly, specializing in high mix/low to high-volume with ISO 9001, ISO 13485, ISO 14001, and AS9100 certified quality management systems. Matric is a part of Matric Group which includes Dynamic Manufacturing and Windurance.



Matric's Vice President of Operations, Patrick Stimpert explained that they had been using SPI (Solder Paste Inspection) and post-reflow AOI for some time, but they were still doing board rework. Patrick was unhappy with the 70% first pass yield that they were achieving and wanted to try to find a way of substantially improving that number. Matric was no stranger to investing in new equipment and had recently updated most of their line with a much faster placement solution, another reason to improve their yield and remove as much margin for error as possible.

With their Koh Young equipment experience, Matric had become really good at post-reflow inspection set-up, but they were still seeing problems with components in the wrong orientation or location. This made the team rethink where and when they were inspecting. It was a natural choice for Patrick and the team to select Koh Young for their pre-reflow AOI solution, and since Matric installed the pre-reflow AOI, they have not looked back.

As Patrick explained "we had to relearn our process to better understand our deviations, but the results were amazing, we moved our first pass yield from around 70% to well over 90% almost immediately and as we became more experienced we pushed it up to the high nineties, 97-98%." Patrick added, "we hit 99.8% first pass yield prior to all the component shortages, but those supply chain problems have pushed us back by 3-4 points."

It is surprising how the parts shortages have added to the challenge of placing parts. Patrick explained that he has seen a lot of new alignment problems with many deliveries having parts with multiple rotations on a single reel. Patrick underlines, "we needed this extra pre-reflow inspection step even more during the parts shortages issues!"





Matric could not be more pleased with what this automated pre-reflow inspection step has delivered. They are getting new products out even faster than ever. They are catching problems before expensive parts are soldered to the board. They are mitigating additional issues brought about by the supply chain crisis. They have higher yields and less costly rework. And because Matric has standardized their inspection around Koh Young solutions, they are enjoying the added benefits of KSMART, the Koh Young smart factory software suite powered by AI.

Patrick sees KSMART as key in the next chapter of digital transformation at Matric. It will easily allow one or two people to make calls across all four lines using SPI, as well as pre-reflow and post-reflow AOI.

Patrick says that “Matric’s KSMART adventure is just beginning with one or two people making the call over all lines in the main facility and standardized programs across all eight lines in both companies.” He adds, “the current skill shortage means we need to work with less people, so we need better systems, better solutions, and better ways to get the most from every operator. Like other Koh Young solutions, KSMART helps us to do this.”

Thanks to the data Patrick and his team get from their inspection system, they can fix problems fast. As Patrick says, “we’re going to fix it, but we never want to do this again...”

Patrick concludes, “I truly believe you can’t be fast enough, flexible enough, and profitable in this day and age without both pre- and post-reflow AOI, especially with such a huge production mix... We might be seen as trailblazers, but the return on our investment is very fast, and what is more, it ensures we deliver on-time. We’re very committed to our promise about on time delivery to our customers.”

As Patrick says, “Matric and Koh Young are attached at the hip”. KSMART delivers the data that Matric needs on both the operational and executive levels. And they are ready to rely on Koh Young’s trusted inspection solutions in new investments, including selective solder process.

This is a partnership that is mutually beneficial and will doubtlessly endure!





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About Koh Young Technology, Inc.

Established in 2002, Koh Young pioneered the market by launching the first 3D Solder Paste Inspection (SPI) system using a patented dual-projection Moiré technology. Since then, it has become the global leader in 3D measurement-based SPI and Automated Optical Inspection (AOI) equipment for the electronics industry. Based on its True3D™ measurement-based inspection technology, Koh Young has developed innovative solutions for challenges with Machining Optical Inspection (MOI), Dispensing Process Inspection (DPI), and Semiconductor Packaging Inspection (MEISTER Series). Through its technology innovations, Koh Young has secured thousands of global customers, and maintains the largest global market share in the SPI and AOI markets. Additionally, by adopting its user-centric R&D activities, it continues to use its core competencies and develop innovative solutions for new and existing markets. Its activities stem from the corporate headquarters in Korea to its global sales and support offices in Europe, Asia, and the Americas. These local facilities ensure it keeps in close contact with the market, and more importantly, its growing customer base to provide access to an award-winning network of inspection and measurement experts. Learn why so many electronics manufacturers trust Koh Young for reliable inspection at kohyoung.com.

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About Matric

For 50 years, Matric Group has been a leader in electronics contract manufacturing, offering services throughout every stage of the product development process. From engineering, PCB assembly, box builds, cable, and harness assembly to aftermarket services, Matric provides turnkey and board-level assembly specializing in low-to-high volume, complex assemblies that other contract manufacturers can't handle. From the BOM, through production, to shipping the assembly, Matric Group works to ensure a high-quality, on-time delivered product. Certifications include AS9100, ISO 9001, ISO 13485, ISO 14001, Nadcap Accredited - Electronics, ITAR, RoHS Compliant, and HUBZone Certified. With over 300 associates between locations, the blend of size, experience, and industry knowledge Matric delivers quality products. Matric Group – “Electronics and People you can count on.”

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