



When Partners Go That Extra Mile

ADCO Circuits' Engineering Collaboration with Koh Young

Some partnerships are a natural extension of the vendor and customer relationship, while some go even further to create something quite special. This has happened not once, but twice in the bond ADCO Circuits and Koh Young share.

This happened when ADCO Circuits worked together with Koh Young to implement a Koh Young Zenith AOI (Automated Optical Inspection) machine to inspect through-hole solder joints. We'll come to that later in the story. But the first game changer was due to the professional persistence of Koh Young to introduce ADCO Circuits to the real value of SPI (Solder Paste Inspection) in the first place.

ADCO Circuits is a 40-year-old business that, rather than use the term EMS, prefers to opt for "High Performance Electronic Assemblers". That's not so surprising given their state-of-the-art 55,000 sq. ft. manufacturing facility in Rochester Hills, Michigan. There they cover everything from PCBA (Printed Circuit Board Assembly) to systems level and box build for volumes from prototype to production.



ADCO Circuits generates approximately \$35 Million in sales from high-tech, high-reliability markets and has over 150 committed team members focused on delivering a reliable robust solution to a demanding customer base. And while ADCO Circuits is close to Motor City (Detroit), they are surprisingly not heavily dependent on automotive electronics.

To SPI, or Not to SPI?

Recently, ADCO Circuits replaced all their surface mount equipment including the screen printers, but they had never seen the need for an SPI solution and didn't invest in the technology. This was despite several tradeshow and meetings with Joel Scutchfield, Director of Sales and Applications at Koh Young and his local sales partner, Jim Rittman from Aligned Solutions. Tirelessly, they would explain the immediate benefits of SPI and why it was the most important inspection machine in the electronics assembly line. Things began to change when ADCO Circuits began completing more and more customer surveys with questions about the onsite SPI capabilities. Then came a critical point when a potential new customer for ADCO Circuits refused to provide new business to any potential manufacturing partner without SPI capabilities on at least one production line.

Koh Young had, on numerous occasions, offered a demo machine, so this seemed like the perfect time to get that machine on the factory floor for an evaluation. With the machine in place, ADCO Circuits had little in the way of expectations beyond finding the rare instance of missing solder - a problem that wasn't frequent at ADCO Circuits, thanks to the exacting standards in place for their screen printing operation.





As a part of the success plan, Koh Young offered the support of Ray Welch, Customer Projects Manager and Six Sigma print process expert. Kevin Barrett, ADCO Circuits' Operations Manager explains, "this was huge for us because he really opened our eyes to the fact that the machine does more than just look, it measures." Adding, "he spent several days here at no charge and it was a huge help, not just working with the SPI, but also showing us settings in the printer that we knew were there but really didn't understand how they would affect the process. We were able to make adjustments and see the immediate impact of the adjustment in the data."

Before SPI ADCO Circuits' biggest concern was missing solder from a clogged aperture, so printer setup and visual inspection was focused on that challenge. Yields were good at AOI and at the final test. After this introduction to SPI and with Ray's help, clogged apertures were not even a thought, it was process control and understanding that drives process variation. This has since become a key focus of the ADCO Circuits team.



One Success Leads to Another

Kevin continues, "a whole new world had opened up around the screen-printing process. The ability to measure and capture the data allowed us to fine tune stencils and machine settings as well as fine tune our AOI. Variations in printing can of course affect the finished solder joint causing variations which, in turn, require you to open the tolerance of acceptability on the AOI. The larger the tolerance the greater the possibility of defects escaping. Fine tuning the printing process leads to fine tuning of the AOI process, which leads to better process control."

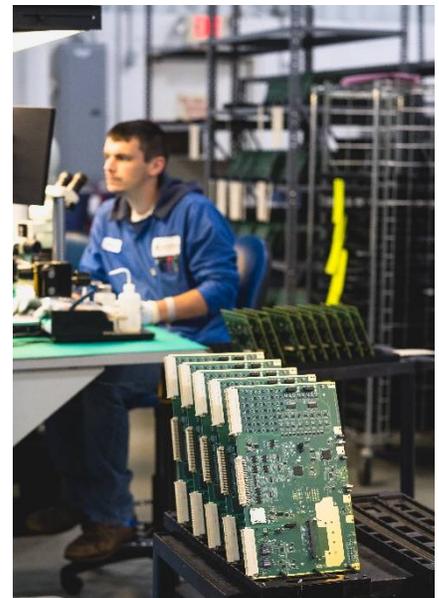
Being a contract manufacturer, ADCO Circuits deals with a lot of quick turns, prototypes, and NPI (new product introduction), as well as a wide range of components across a wide range of board sizes, thicknesses and designs. With the skills and knowledge learned using the Koh Young SPI, ADCO Circuits' Engineers can review the requirements ahead of time, design or modify the stencil based on the data accumulated over time, and then determine how much paste is needed and where.

PCB designers populate boards with combinations of small and large components which can create a challenge when using a single stencil thickness. Kevin explains that, "an aperture size increase or reduction in the stencil used to be a guess and wait to see how it runs, not anymore! By dealing in volume - not height - and accurate measurements, it's much less of a challenge. After we have done all the math, we can run a very small sample and determine through data where we are compared to our objectives and then determine any variations in real time. This has been a large contributor, which has allowed us to get it right the first time on the first board."

The SPI quickly became much more than ADCO Circuits had originally thought, especially with the increase in component density and associated rise in pads on newer boards. As soon as ADCO Circuits understood the benefit and witnessed them firsthand it was a no brainer to invest in an SPI for each of the other lines.

A New Challenge

Having enjoyed this level of success and having seen directly how closely the team at Koh Young had worked to fulfill ADCO Circuits' objectives, Koh Young became the obvious choice to collaborate with and address a new production challenge.





According to an article published on ADCO Circuits' website, entitled [ADCO Circuits Advances Complex Technologies With Ongoing Capital Investments](#), "ADCO is adapting existing technology for use in groundbreaking new ways. They presented Koh Young with their new challenge of inspecting through-hole solder joints on the bottom side of their assemblies. ADCO Circuits' engineers partnered with Koh Young to help create new algorithms for through-hole inspection."

The conversion gives ADCO Circuits a better, more efficient method of inspecting large numbers of through-hole solder joints. Manufacturers have traditionally hesitated to employ this process because of concerns about longer programming times and high false call rates. ADCO Circuits and Koh Young overcome these challenges by using existing mechanical, optical and software design alternatives in the AOI which are unavailable in other conventional through-hole inspection systems.



Going Beyond Equipment

ADCO Circuits' relationship with Koh Young started years prior with their first SPI. As Kevin Barrett, ADCO Circuits' Operations Lead explains, "we had good experiences with Koh Young, so when we had a shortfall of capacity in THT inspection, we went right to them to see what they had to offer."

Kevin also spoke to other vendors, but quickly realized that no one had what he needed. He recognized that Koh Young was likely to successfully meet the technical challenges and was also convinced they were the right partner because of the excellent service and support he experienced with their SPI system.

Kevin explains, "when we talked to Koh Young they were on the same page and were in the process of developing a solution, so we went ahead and had them bring a demo machine into the factory." Adding, "we hooked it up and it looked good from the get-go, doing most of what we wanted to do."

Real Time Collaboration

From then on it was a close collaboration to bring the solution to fruition. Kevin was particularly struck with the efficiency and speed at which things got done. When ADCO Circuits had an issue, they'd share the data with Koh Young and within a day or so they'd have an update to resolve the challenge. Kevin describes the collaboration as "a great partnership, because it was almost real time."

The collaboration included plenty of input from both sides, including Koh Young staff spending time onsite at ADCO Circuits to make sure the solution was really performing exactly as they needed.

In many ways, Kevin and the team at ADCO Circuits are pretty altruistic. They were delighted that the solution developed with Koh Young worked for them, but also more than happy to have their efforts used to help the industry in general.

According to Kevin, one reason this project was so successful and that they appreciate Koh Young so much, is that "every single person or team we've dealt with at Koh Young has been on top of it. If they don't know the answer, they get the answer and you're not ever waiting for action. There's no passing the buck"

More Inspection Please

As ADCO Circuits looks to the future they know more inspection is on the horizon and they'd really like that inspection equipment to come from Koh Young. Kevin has already talked to Koh Young about other inspection solutions he'd like to see offered from them and form even more integrated inspection ecosystem.

Sometimes you don't know what you're missing until you have it. ADCO Circuits didn't realize how much they were really missing until they incorporated SPI into their lines. Now, SPI is a part of the process they would never do without.



Kevin concludes, “Koh Young’s willingness to share what they know and have learned combined with the professionalism from sales and all the way through install, service, and aftermarket support is of huge value to us. I have been in this business for a while and have trouble thinking of a company that has supplied a consultant free of charge to train us to use the machine, and not just as a machine but as an integral part of our process set up and control. Koh Young is truly a partner not just a company we deal with.”

Download your copy of [The Printed Circuit Assembler’s Guide to... SMT Inspection Today, Tomorrow, and Beyond](http://iconnect007.com/index.php?cID=841) at <http://iconnect007.com/index.php?cID=841>.

Attend the on-demand, [free 12-part webinar series](http://iconnect007.com/index.php?cID=841), “Converting Process Data into Intelligence,” with Koh Young experts Joel Scutchfield and Ivan Aduna at <http://iconnect007.com/index.php?cID=841>

About Koh Young Solutions at ADCO Circuits

ADCO Circuits has multiple Koh Young KY8030-3 SPI and Zenith Series AOI solutions connected with KSMART smart factory solution software. You can learn more about these products and the rest of the Koh Young portfolio at www.kohyoungamerica.com. For more information about ADCO Circuits’ electronics manufacturing capabilities, visit adccircuits.com.

About ADCO Circuits

ADCO Circuits, Inc., established in 1981 in Rochester Hills, Michigan, provides electronic circuit board assembly and module services to a wide range of companies in the industrial, medical, automotive, telecommunications, and aerospace/military equipment markets. As a full-service turnkey supplier of custom electronics, ADCO provides support from design and prototyping to new product introduction and full-rate production. Its state-of-the-art, ,000-square-foot facility handles low- to medium-volume assembly and test. Advanced capabilities include an automated stockroom, automated selective soldering, and Flex-SMT lines with STI and AOT and off-line X-Ray. ADCO Circuits is ISO 9001, AS9100, and IATF16949 certified, and ITAR and GIDEP registered.

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About Koh Young

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 leverage 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 manufacturers trust Koh Young for reliable inspection at kohyoung.com.

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