# AI-based Visual Inspection Tech Tackles Counterfeit Components

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Cybord is a software company that aims to help OEMs improve the reliability and security of their electronic products. Based in Israel, the company was founded by Dr. Eyal Weiss after he experienced a crisis due to counterfeit electronic components in a military-grade project that took 12 years to develop and deploy.

It took his team months to trace the problem down to a 3-cent passive component. "I then realized that component provenance and traceability require more attention," said Dr. Weiss.

And he was not the only one. It is estimated that 5–10 percent of all components on the market are counterfeit, resulting in poor reliability and exposure to cyberattacks.

In an interview with EE Times Asia, Dr. Weiss discusses the counterfeit component challenge, its impact on the electronics supply chain, and how his company is helping manufacturers address this issue.

Excerpts from that interview:

**EE Times Asia: What is the problem you are trying to solve?**

Dr. Eyal Weiss (EW): It's no secret that electronic components are the main cause for hardware failure. But because electronic components come in a large variety of shapes and package types, authenticating components is a highly specialized manual forensic process, which is not scalable. Lab testing is very limited and almost symbolic, with less than 1% of components being inspected. As a result, recycled, defective, misdocumented, tampered, and otherwise counterfeit components constantly infiltrate

the supply chain. Such components carry failure and security risks that must be eliminated.

Noncompliant electronic components lead to product malfunctions that may get discovered during manufacturing, or worse, in the field. Manufacturers are often unaware of this root cause and mistakenly attribute these problems as workmanship issues.

When failure happens, OEMs refer to their traceability systems to estimate the scope of the problem. But traditional traceability methods simply save components' documentation and do not inspect each component to establish provenance. Thus, accurately defining the scope of failure is extremely difficult.

At Cybord, we invented a software solution that inspects every component as it is placed on the PCB, using images taken by SMT pick-and-place machines. By applying AI and big data algorithms, we are able to identify every component as well as inspect its exteriority. It's important to note [that any difference between authentic and counterfeit electronic components can be identified visually](#).

**EE Times Asia: How are you helping your customers? What technologies, solutions, or innovations are you offering to address those challenges?**

EW: We achieved three breakthroughs that helped us overcome component inspection and traceability. First, there was no accessible, scalable method to inspect and trace individual components. We solved this by partnering with SMT equipment vendors to gain access to component photos at time of placement.

Second, we developed and patented AI and big data algorithms that allow us to analyze components and reach decisions in milliseconds, so corrective action can take place early during the assembly process, before reflow and with minimal impact on labor and product reliability.

And third, we have built an extensive database of components that is growing at a rate of tens of millions of components every day. The rate is accelerating as we connect more customers to our network.

With 100% component inspection coverage, our customers experience improvement in product reliability, recalls, supply chain intelligence, and manufacturing efficiency. Early detection of unauthentic, recycled, damaged, aged, and tampered components reduces the impact on product reliability and business continuity. Cybord inspects components where it makes most sense, in-line during assembly and before reflow. We create a digital twin of every component to be used as proof of provenance and failure analysis.



Electronic component inspection software, integrated into the assembly process
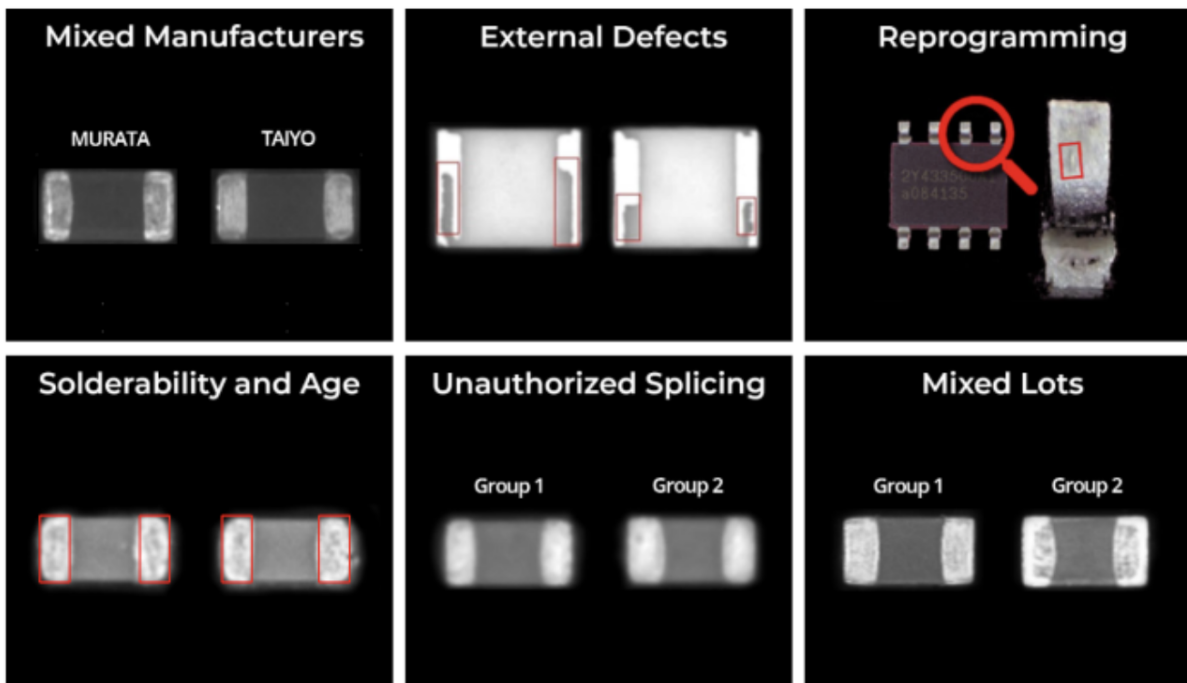
**EE Times Asia: What makes your solution unique?**

EW: Cybord is the only solution on the market to introduce AI to the most valuable part of the product—the components. We inspect 100% of the components, and we do so using only software and when it matters most, right at product assembly. Doing so enables our clients to offer more reliable products that cost less to build, alongside visual traceability that serves our clients for failure analysis and proof of provenance.

**EE Times Asia: What markets need this type of solution?**

EW: Our solution is most suitable for OEMs who offer high reliability and mission critical products. Automotive, medical devices, high-end electronics, and military/aerospace are among these industries.

**EE Times Asia: What can you say about the global chip shortage happening right now?**

EW: The worldwide chip shortage forced supply chains to purchase chips in the open market. And the open market carries quality and security risks, which companies try to avoid via lab inspection service. Unfortunately, doing so does not provide complete coverage.

To better support our clients, we also offer an incoming material inspection solution that applies our technology before the assembly process. This solution applies Cybord's inspection technology to images obtained by our reel inspection machine. This serves our clients who seek the highest standard of production and confidence about the provenance of sourced materials and wish to mitigate these risks.

**EE Times Asia: What do you think is needed to really transform the industry?**

EW: I think the electronic industry is in the process of moving from isolated equipment put together to an integrated approach where all production and logistics equipment speak the same language. This in itself is a big step forward in efficiency and quality. However, to achieve a real breakthrough, the industry must make a leap in the way it utilizes electronic components. Smart analytics tools for electronic components instead of the current 'trust' will make the overdue leap in quality and reliability of products.

**EE Times Asia: What is your outlook for the semiconductor industry?**

EW: First, the industry is currently trying to fill an unexpected gap; a slow process that will take months and months to accomplish. Shifts in supply and demand will determine the destiny of new foundries, and I envision many of these new initiatives to fail midway and get acquired by the big players in the industry. Second, because of alternative sourcing, we will see a natural uprise in product failure and a drop in manufacturing yield.

**EE Times Asia: Any final comments?**

**EW:** The recent supply chain events emphasized the need to shift towards zero trust manufacturing. Achieving this starts with the ability to identify material without having to rely on OCMs [original components manufacturers] and distributors and should not rely on specialized hardware, since it will require enhancements from OCMs and will not provide support for legacy components.