

How did SHIN-ASAHI ELECTRIC IND. win the trust of its clients?

The company was founded in 1980 as a manufacturer specializing in printed wiring boards. The company's head office and factory are in Shinasahi-cho, Takashima City, Shiga Prefecture, west of Lake Biwa. It also has affiliated companies in Yamanashi and overseas. The company continues to focus on quality with the fundamental "Techniques". It has introduced its own "Master System" to train experts and improve technical skills, thereby striving to maintain high quality.

SCREEN spoke to SHIN-ASAHI ELECTRIC IND. about the background that led them to introduce SCREEN's Automatic Final Visual Inspection (AVI) system FP series, how it is currently being used since its installation, and why it continues to increase the number of systems.



Mr. Takeshi Ishikura
(Deputy Director of Manufacturing Department)



Mr. Yūya Yamamoto
(Manufacturing Department, Manufacturing Section 2, Section Chief)



Ms. Sara Ishida
(Manufacturing Department, Manufacturing Section 1, PP Section)



Ms. Miho Koyama
(Manufacturing Department, Manufacturing Section 1, PP Section)

Background to the introduction of the AVI system.

SHIN-ASAHI ELECTRIC IND. said that there were many complaints from clients about defects in the past. There were as many as 130 complaints received in 2013. 27 were critical and 94 were requests for improvement out of 130 complaints. Not only the quality assurance and sales department members were responsible for complaints but also the production and inspection departments were forced to respond, which affected the delivery dates and lead times of other products. Therefore, reducing the number of complaints was essential.

The improvement activities did not help to reduce the cases if we continued with manual visual inspection. It was time to try with the AVI system and installing SCREEN's AVI FP-9000 was the most ideal thing to reduce cases.

The number of complaints gradually decreased after the FP-9000 was installed. Subsequently, six FP series units were installed including its newest model the FP-9200. In 2023, the average was about 20 cases; the number of critical complaints had decreased to zero, 18 requests for improvement and two others.

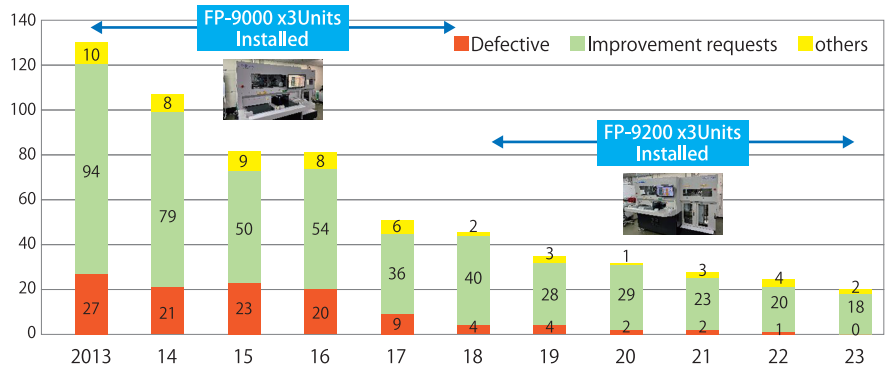
Important points in model selection

Although we decided to install AVI system, "It was difficult to find an inspection machine that met our needs," said Mr. Ishikura. We narrowed the model selection to key points, with operability and service capabilities being the most important considerations.

In terms of operability, the system would no longer be available if it could only be operated by a specific operator. Therefore, importance was placed on an easy-to-use system that had a wide range of detection parameters with high detectability, and could be used by anyone.

In terms of service capability, we placed importance on manufacturers who could respond immediately to inquiries about malfunctions and settings. It is preferable to choose a manufacturer that has a

Introducing the AVI system with a transition in number of defective product leaks.



support base nearby. The reasons for deciding on the FP Series included the agility of the manufacturer. SCREEN carefully instructed on how to operate the system and the technician would arrive within a few hours once we contacted.

Is the detection rate of the FP-9000 series as expected?

SHIN-ASAHI ELECTRIC IND. has seven staff members who can create inspection data for automatic inspection machines. It was a high number compared to the typical rate at others, where only 1 or 2 people were involved.

"This number of personnel leads to a high detection rate and into our ability to reduce claims due to leaks," Mr. Ishikura said. The quality requirements were different for each client even for the same product such as automotive or general products. So, SHIN-ASAHI ELECTRIC IND. created inspection data depending on the delivery destination. Mr. Ishikura said that "Having seven staff members will enable them to generate a large amount of testing data, reduce false positives, and increase the detection rate."

So what about the other skills that were considered during the selection process? First, the inspection speed. The FP-8000 series was introduced first, and was capable of inspecting 6,000 to 7,000

sheets per day. The FP-9000 series was capable of inspecting 11,000 sheets, and this was sufficient inspection capacity.



In addition, the system downtime was about 15 to 20 minutes when creating new inspection data, which led to better production.

Benefits of installing the FP-9000 Series

So what kind of effects were seen after the FP-9000 series? Before FP-9000 series, we carried out double inspections by using another inspection system and manual visual inspection according to Mr. Ishikura. Inspections were carried out by a team of 15 people working both day and night shifts. Howev-

er, the number of manual visual inspection personnel has been reduced to two people, who were working on the day shift only after the FP-9000 series. These two personnel's duty was to inspect special products that required manual visual inspection for clients who demanded strict checks.



Mr. Ishikura

SHIN-ASAHI ELECTRIC IND. has been able to allocate more manpower to creating inspection data by reducing the numbers in manual visual inspection, which achieved both a high detection rate and reduced false reports. Also, there was only one verification personnel for each AVI system during operation. As a result, the production time has been shortened by about one day compared to the double inspection period, which was performed by other inspection systems and manual visual inspection.



We were able to maintain high quality even with such efficient personnel management. In fact, we have received awards for recognition of our quality from our clients. The products were lined up in order of quality at the ceremony and we were able to be lined up in the front with proud feeling. Our quality has earned the trust of clients. This was important and it led to requesting prototypes when developing new products.

The data obtained from the FP-9000 series was used to repeatedly carry out unique quality improvements.

However, the AVI system did not magically solve all the problems. Various issues occurred and led to increased awareness of quality after the AVI system.

Increased resolution provided the possibility to detect more defects that were previously undetectable. Due to this reason, the yield rate deteriorated from 96% to 95% when the FP-9000 was installed.

SHIN-ASAHI ELECTRIC IND.'s internal Quality Control Club activities aimed at a higher quality than before, including improvements to the manufacturing process, which would play a significantly important role since the new AVI system had higher detection capabilities. Therefore, we were able to implement "Improvement Activities" to improve the quality of each process by analyzing the causes of defects detected by the FP-9000 series and feeding back the results to the process in which we occurred. In addition, SCREEN's Automatic Optical Inspection (AOI) system MIYABI-7 was also used to improve quality in the inspection process as part of "Improvement Activities".

We were able to maintain and improve quality by



updating the system for areas that could not be addressed through "Improvement Activities" alone. Currently, the yield rate is around 97 to 97.5 percent.

In addition, a "Customer Records" of inspection data was prepared for all processes. Strict inspections could improve quality, but we could also lead to excessive quality. This would result in a decrease in yield rate. On the other hand, prioritizing the yield rate could lead to a decline in quality. Finding a perfect balance was significantly important.

For this reason, multiple inspection data sets were prepared and switched between for the same product. However, changing the inspection accuracy was not an easy task. This success was due to the company's continued efforts to hold detailed meetings with its clients' procurement departments and actively listen to what quality was required. Needless to say, this was backed by a strong relationship of trust with clients, backed by high quality. The content of these interviews was then fed back into the inspection process, allowing multiple pieces of inspection data to be created and used, all thanks to the large number of people creating the inspection data.

How do you want to develop it in the future?

Nowadays, circuits are becoming more intricate, and more products require strict quality assurance like automotive products.

Increasing the volume of in-vehicle circuit boards handled requires high quality, and even in the AOI process, full inspection rather than random inspection is required. This will require an increase in staff.

However, it is not easy to recruit personnel due to social conditions such as a declining population. The demand for equipment that can reduce the number of personnel required while still providing high inspection quality.

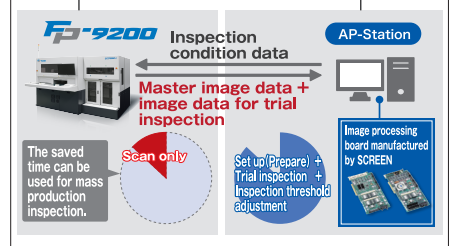
For example, I would be interested in a system that can find circuit defects underneath a symbol mark. I would like to see further development of equipment that can increase the operating rate of inspection system such as the AP-Station.

Of course, with the cooperation of equipment manufacturers, we believe that further improving the defect detection rate and introducing AI into the inspection process will also lead to a reduction in



SHIN-ASAHI ELECTRIC IND.CO.,LTD. Head Office

AP-Station dramatically improved the operating rate of the inspection system.



verification work, and we would like to consider ways to improve work efficiency through these measures.

We also want to recruit a variety of personnel to operate the inspection machines. For this reason, Mr. Yamamoto says he would be happy if inspection machines also adopted universal design, which is easy to use.



Mr. Yamamoto

He told us that even if the introduction of new technologies such as AI reduces the number of workers required, ultimately, high quality can be guaranteed by having a system in place that allows humans to properly manage the process.



They pledged to continue to cooperate and shook hands firmly. SHIN-ASAHI ELECTRIC IND.CO.,LTD. President Ms. Oshima and SCREEN PE Solutions President Mr. Suemori



SHIN-ASAHI ELECTRIC IND.CO.,LTD.

〒520-1511
2588 Warazono, Shinasahi-cho,
Takashima City, Shiga Prefecture
TEL:0740-25-5333

SHIN-ASAHI ELECTRIC IND.YAMANASHI CO.,LTD.

〒400-0493
432-5 Shimotoda, Toda, Minami-
Alps City, Yamanashi Prefecture
TEL:055-284-2111

SCREEN PE Solutions Co., Ltd.

Address: 1-1 Tenjin Kita-cho, Horikawa-dori Teranouchi-agaru 4-chome, Kamigyo-ku, Kyoto 602-8585 TEL:075-417-2704

SCREEN GP Japan Co., Ltd.

East Japan / 135-0044 1-1-1 Etchujima, Koto-ku, Tokyo Yamatane Fukagawa 1st Building 5F
West Japan / 520-2323 2426-1 Mikami, Yasu City, Shiga Prefecture

TEL:03-4334-7217 (main)
TEL:077-586-5111

www.screen.co.jp/pe

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