

USER STORY

Industry: Automotive

Calsonic Kansei Korea Co., Ltd.

FARO Enables a Five-fold Increase in Measurement Efficiency for Calsonic Kansei Korea

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The ScanArm ES is a portable 3D articulated measuring device that resembles the human arm in appearance. The device moves freely with its arm-like joints and is capable of performing measurements either through probing or 3D laser scanning of the target objects. Within seconds, the ScanArm ES acquires point cloud data consisting millions of points.

Foreword

For the human body, eating right is essential for a healthy and functioning digestive system. The same concept can be applied to automobiles. If a car is filled with proper fuel, its exhaust system will convey burnt gases away from the engine without any complications.

Calsonic Kansei Korea Co., Ltd. (Calsonic Kansei Korea) – a leading, South Korean automobile manufacturer that supplies exhaust systems to Renault Samsung Motors Co. Ltd. – was established in 1996 as a joint venture company based on the technology of Calsonic Kansei, a dedicated automotive parts manufacturer in Japan.

The company adopted the One Touch Changeover System and Inline Manufacturing concepts and applied it to its manufacturing stages, right from parts production to final assembly. This enabled the company to produce automotive parts that can be directly mounted onto a completed car, simply by fastening a couple of bolts via intermediate assembly.

Calsonic Kansei Korea Takes Pride in its High Standards

The company is committed to producing top-quality exhaust systems. To this end, it strives to achieve the goal of Zero Defect manufacturing, through the adoption of high quality standards and well-trained labour, as well as the application of fool-proof devices, NC pipe bending, and a synchronized robot welding system. Calsonic Kansei Korea's exhaust system adopts a pre-converter and main converter, and is renowned for its unrivalled quality and performance, making it the preferred choice in any market around the world. To maintain its top-notch product quality, Calsonic Kansei Korea undertakes exceptional quality control practices and proactively finds ways to refine its processes.

Calsonic Kansei Korea's shop floor where exhaust systems are produced



Fixed CMMs: Insufficient for World-class Quality Assurance

Since its inception, Calsonic Kansei Korea has mainly relied on the fixed coordinate measuring machine (CMM) and conventional hand tools, such as vernier calipers, R-gauges, and shape detection tools for quality control. A 2D measuring instrument takes a longer time to measure objects and has proven to be vulnerable to measurement errors. Separately, a fixed CMM has its shortcomings too – it is inadequate for curves and contour lines on pressed parts and pipes, and it does not produce accurate results.

"It was difficult to measure contour lines or the overall shapes of objects with a fixed CMM, especially when forming iron plates," said the Deputy Head of the Quality Assurance Team at Calsonic Kansei Korea, elaborating on the challenges and struggles that his team faced with the existing system. "It was not easy to inspect shapes with our other tools in the inspection chamber either. One may be able to detect the presence of a gap, but it is difficult to check for its accurate dimensions or other associated data. I have to admit that product reliability can drop considerably in the process."

In a bid to improve its inspection process, Calsonic Kansei Korea then decided to tap on an equipment support project offered by the Busan Techno Park, where they came across FARO's devices.



The FARO Edge ScanArm is a portable CMM that is shaped like a human arm

FARO Devices: Total Satisfaction at the First Encounter

"I remember my first encounter with the FaroArm, where we used it to survey contour lines and the cross-section of our pipes and pressed parts," recalled the Deputy Head of the Quality Assurance team. "It worked very well!"

Not long after, he came across another similarly impressive measuring device in the plant. Upon closer investigation, he realised that it was yet another FARO product, the FARO® Platinum.

He added, "Our colleagues in Plant 2 purchased the device earlier to perform dimension checks on panels. It had actually been sitting there for quite a while, but because it was used only in Plant 2, none of us in Plant 1 had any idea how effective and efficient the instrument was for measuring parts."

"Our competitors have been using 3D scanning devices for a long time now," he continued. "Our customers in Europe would demand for 3D scan data whenever they had any issues with the quality. I realised that the overall expectations for quality assurance both in South Korea and in the global market have jumped from 2D practices in the past to an entirely new level based on 3D instruments."

Calsonic Kansei Korea is convinced that 3D scanning and measurement technologies have become fundamental for them to match up with global quality assurance practices.

The Quality Assurance team then began the process of procurement for the new measuring device. In addition to the team's own positive experience, the Deputy Head of the department had also witnessed the outstanding performance of FARO devices in Busan Techno Park. While FARO was naturally their top choice, they kept their options open by exploring other potential alternatives.

During their research, Calsonic Kansei Korea learned that the Head Office in Japan had also been using FARO devices. Given that their Japanese counterparts practiced very stringent selection processes, the team felt that HQ's choice to use FARO devices was indicative of the supplier's product quality. For all those reasons, the team in Korea purchased it with no further hesitation.

From the range of FaroArm products available, Calsonic Kansei Korea picked the FARO® Edge ScanArm ES for its contact-type measurement capabilities as well as its scanning functionalities. The ScanArm ES was perfect for the needs of the company, since the team required 3D scanning for the pressed parts and also carried out contact-type measurements for calibration in the inspection chamber.



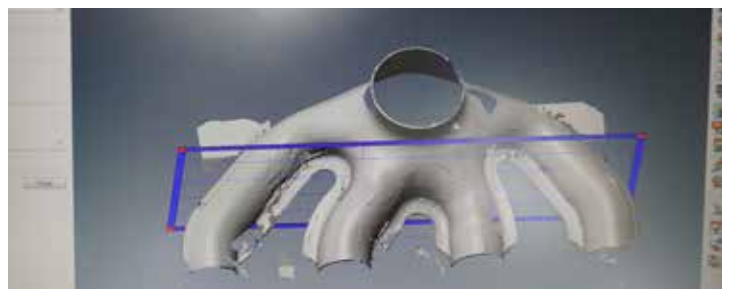
Calibrating an inspection fixture with a tactile probe.

Job Efficiency Improved More Than Five Times

The ScanArm ES is a portable 3D articulated measuring device that resembles the human arm in appearance. The device moves freely with its arm-like joints and is capable of performing measurements either through probing or 3D laser scanning of the target objects. Within seconds, the ScanArm ES acquires point cloud data consisting millions of points.

Since introducing the ScanArm ES, the Deputy Section Chief of the Quality Assurance Team has reported a five-fold increase in job efficiency. He revealed, "On average, FARO devices are used around two hours each day, five days a week, excluding weekends. "What would have taken nearly a day with the fixed CMM is now completed within two hours, which is a five-fold increase in efficiency!"

Evidently, FARO devices have made significant improvements to the company's processes and efficiency.



Top: 3D Scan of a pressed part when viewed through the software.
Bottom: A cross section view of the same pressed part

1. Significant Improvements to Work Processes and Measurements

Previously, the inspection process was tedious, as technicians had to cut up products one by one before they could take any measurements. Furthermore, the team often was unable to use the R-gauge due to the difficulty in obtaining measurements.

With the ScanArm ES, inspection processes have changed completely. The target object can be scanned completely within a time frame of just a few minutes. Following that, all of the data, including the measurements, are transmitted to the dedicated software. The 3D modeling data generated is then cut across its cross-section to allow for an immediate confirmation of accurate measurements – whether width, height, roundness, or plane – before they are compared with CAD data. All inspections can now be performed easily and swiftly with the ScanArm ES.

2. No More Complex Inspections!

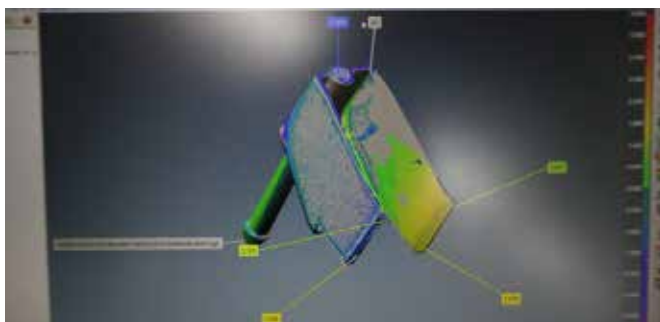
In the past, a complex inspection process spanning four to five stages had to be performed: first, an inspection with the fixed CMM, followed by first and second dimensional inspections of the parts that could not be fully verified in the first inspection stage.

Now, scanning with the ScanArm ES is all it takes to complete the entire inspection process, because the 3D modelling data generated within a few minutes allows technicians to directly arrive at a conclusion. The inspection process, which was previously spread across four or five stages, has now been reduced to a single-stage operation. As a result, the amount of time and labor associated with the inspection is considerably reduced.

3. No More Conflict in Measurements

Before, it was difficult to pinpoint specific improvement points on welded products in the inspection chamber. Even if the shape of each product was verified in the inspection chamber, it was difficult to identify the extent of its gaps. Consequently, welded products that exceeded the acceptable tolerance range remained undetected on occasion. This issue is now resolved as the ScanArm ES delivers error-free measurements and provides 3D shapes of welded products.

In the case of pressed parts with uneven surfaces, it was difficult to obtain accurate X, Y, and Z coordinates with the fixed CMM. Now, simply by checking the cross-section of the modeling data generated by the ScanArm ES, measurements of the processed parts' protrusions can be determined right down to the decimal points. Field staff can hence proceed with a set of accurate measurements instead of the previous rough estimations they had to work with. Such improvements have eliminated any misunderstandings or conflicting perspectives. The work process is also notably accelerated.



Top: Scanning of uneven pressed parts with the 3D laser scanner.
Bottom: 3D scan data with highly repeatable and accurate measurements.

4. Growing Together with Partners

Previously, potential problems would be identified only after the processed parts were put into the manufacturing line. If there was a problem, the supplier of the product would then be notified. In fact, suppliers would achieve a final product that corresponds to the drawing only after multiple iterations.

Now, however, any processed product received from a supplier can be promptly checked for discrepancies via 3D scanning. As there is no need to put them into the production line to obtain feedback, suppliers can now produce molds that match up with their drawings with greater ease.

Currently, the Quality Assurance Team of Calsonic Kansei Korea is using the FARO Edge ScanArm ES 90% more frequently than it uses the fixed CMM. Judging from the remarkable improvement in work efficiency the team has experienced since adopting the FARO devices, Calsonic Kansei Korea will continue to grow and advance with the support of FARO.

Calsonic Kansei Korea Co., Ltd



About Calsonic Kansei Korea Co., Ltd

Calsonic Kansei Korea Co., Ltd. is located in Hallim-myeon, Gimhae-si in Gyeongsangnam-do. The company employs a total of 150 employees in its production plant and offices, that span an area of 32,700m².

Established in 1996, the joint venture is set-up based on the technology of Calsonic Kansei, a leading auto parts manufacturer of Japan. The company produces top-quality exhaust systems for automobiles and supplies them to leading auto manufacturers in South Korea and around the world, including Renault Samsung Motors Co. Ltd. Endorsed by its customers, the company is now committed to exporting its products to the global market, based on the strength of its world-class technology and product quality.

About FARO

FARO is the world's most trusted source for 3D measurement, imaging and realization technology. The Company develops and markets computer-aided measurement and imaging devices and software. Technology from FARO permits high-precision 3D measurement, imaging and comparison of parts and complex structures within production and quality assurance processes. The devices are used for inspecting components and assemblies, rapid prototyping, documenting large volume spaces or structures in 3D, surveying and construction, as well as for investigation and reconstruction of accident sites or crime scenes.

FARO's global headquarters are located in Lake Mary, Florida. The Company also has a new technology center and manufacturing facility consisting of approximately 90,400 square feet located in Exton, Pennsylvania containing research and development, manufacturing and service operations of its FARO Laser Tracker™ and FARO Cobalt Array Imager product lines. The Company's European regional headquarters is located in Stuttgart, Germany and its Asia Pacific regional headquarters is located in Singapore. FARO has other offices in the United States, Canada, Mexico, Brazil, Germany, the United Kingdom, France, Spain, Italy, Poland, Turkey, the Netherlands, Switzerland, India, China, Malaysia, Vietnam, Thailand, South Korea, and Japan.

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