

Mitutoyo

# CUSTOMER CASE STUDY

Kosei plant × Mitutoyo



KOSEI PLANT INC. | Shimabara, Nagasaki

## Environmentally Durable CNC CMM Automates 100% Measurement, Realizing Production Lines Requiring Only 1/6 Man-Hours of Conventional Lines

KOSEI PLANT, a company manufacturing high-precision parts for various industrial equipment using multi-function lathes, is highly regarded especially by semiconductor equipment manufacturers. This is a case study of the company's initiatives for automating 100% measurement after machining to meet further growth in orders.

Model introduced: MISTAR 555, Shop-floor Type CNC CMM

## 1 Customer's Business

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Ninety-nine percent success equals zero: Manufacturing precision machined parts with absolute precision and quality



Inspecting a precision lathe machined part with the CMM

KOSEI PLANT is a manufacturer specializing in multi-function lathe machining of metallic materials such as aluminum, stainless steel, and titanium. For more than 20 years, the company has been manufacturing, among others, parts to be used for semiconductor equipment requiring extremely high precision, thus acquiring the full confidence of customers for the techniques and expertise it has accumulated over the years. The slogan of the former president (current chairman), "ninety-nine percent success equals zero," is deeply ingrained throughout this quality-oriented company. Even when only sampling inspection is required from customers, 100% inspection will be voluntarily conducted to assure quality.

## 2 Challenges Faced

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Started constructing automated production lines responding to increased orders and labor shortages

In conjunction with the recent increase in semiconductor demand, orders for precision machined semiconductor equipment parts manufactured by KOSEI PLANT are also increasing. President Sakamoto, who was then considering building a second plant to meet the increase in orders, looks back on that time, "We decided to build automated production lines in the second plant, considering we should work on automation in anticipation of the increasingly difficult task of securing human resources". For KOSEI PLANT, committed to thorough 100% inspection of high-precision products, automated measurement in production lines is a prerequisite. Thus, maintaining measurement accuracy at the production site and smooth linkage with peripheral devices became challenges for them.



Mr. SAKAMOTO ATSUNORI, President and CEO



## 3 Strategic Approach

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### Introducing the MiSTAR 555, Mitutoyo's CNC CMM, installable at the production site



MiSTAR 555 installed at the production site together with machine tools and robots

To implement automated production lines, KOSEI PLANT introduced the MiSTAR 555, Mitutoyo's Shop-floor Type CNC CMM. At the beginning, the introduction of another Mitutoyo measuring machine was considered. Then, the MiSTAR 555 was launched as a new product. Its features were found to be suited to the requirements of the automated production lines. This resulted in the introduction of the MiSTAR 555. The MiSTAR 555, with its superior environmental resistance, can maintain measurement accuracy even in a production site subject to temperature changes, oil, and dust and can be integrated into production lines. It features a three-sided open structure for greater layout flexibility and easy integration with peripheral devices, such as machine tools and transport robots. Various companies, led by a robot system integrator, were involved in the launch of the automated production lines. From Mitutoyo, the MT Solution Department (as of 2020), specializing in supporting automation, participated in the installation of this product. As a result of the construction of the automated production lines with which all the companies involved were working in close cooperation, President Sakamoto evaluates the achievement, saying, "I don't remember any particular difficulties in the start-up process, and we were able to give shape to our requirements as they were."

## 4 Solution and Results

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### Automated 100% inspection and target value correction have contributed to improved productivity and reduced defect rate

The incorporation of the MiSTAR 555 actualized production lines covering various processes from material input to processing, measurement, and finished product stocking. As a result, the process man-hours have substantially reduced and the workforce can be reassigned to other tasks, allowing the company to improve productivity significantly. At the same time, the measurement results of the MiSTAR 555 are fed back to the machine tools for automatic correction of target values, thereby reducing the number of defective products. "Apart from the MiSTAR 555, there was no other measuring machine that could have made the present automatic production lines possible. Thanks to its automatic measurement capability, we can continue reliable production even at night," said President Sakamoto.



An automated production line comprised of two machine tools (left and right) and a measuring machine (center) taking advantage of the three-sided open structure

## Achieving a production system in which one operator can control three automated production lines



Three automated production lines are in operation in the second plant

KOSEI PLANT launched the first automated production line at the time of constructing the second plant in 2020. Since then, additional lines have been implemented continuously, and now three automated production lines are in operation. The conventional production method required about six operators assigned to each machine. In contrast, the automated lines can be controlled by a single operator, achieving significant labor savings. In those lines, system-related problems can be solved remotely. Operators can operate the automated production line simply by running the machines as usual. "But for the automated production lines, we would have long ago exceeded the capacity to respond to the recent increase in orders," said President Sakamoto looking back.

## 5 Future Prospects

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### Continuing the challenge for further automation and digitalization



The Grand Prize won at the Nagasaki Invention and Innovation Exhibition

KOSEI PLANT has built a solid position as a manufacturer of multi-function lathe machining through its technical capabilities accumulated over the years and its pursuit of high-quality products. It has become a business attracting attention in the region. For example, the automated production lines built in this project, capable of automatic correction of target values, won the Grand Prize in the small and medium enterprise category at the Nagasaki Invention and Innovation Exhibition as a cutting machine tool system that enables labor savings and high efficiency. KOSEI PLANT plans to continue expanding automated production lines to meet further growth in orders for precision machined parts. In addition, the company has been active in adopting the latest digital technologies, such as AI cameras, AI production planning, RPA-driven streamlining of administrative tasks, and introduction of 3D-printers. KOSEI PLANT's commitment to better manufacturing and workplace creation will continue to lead the industry.





## Customer Profile

### KOSEI PLANT INC.

KOSEI PLANT

Location: 2757 Ariake-cho Omisaki Bo, Shimabara-shi, Nagasaki

Established: March 1980

Business: Precision parts machining

URL: <https://www.koseiplant.com/>

\*The information provided is current as of the time of the interview (December 2023).

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## Related product



### MiSTAR 555, Shop-floor Type CNC CMM >

Highly environment-resistant CMM, allowing on-site inspection outside the measuring room