



KOKUSAI ELECTRIC's Value Creation

By collaborating with stakeholders, we will develop and create ecosystems with the aim of creating a sustainable future.

Value Creation: Cases and Topics

1 Contributing to the Growth of the IoT and Automobile Industries by Providing a New Vertical Furnace for 200mm Wafers

—Refurbished low-cost high-performance thermal processing equipment for 200mm wafers, aiming to create a sustainable future—

Semiconductors have been contributing to the convenience of our daily life and are now expected to play a substantial role to mitigate global warming and prevent the depletion of resources. In particular, power semiconductors are attracting considerable attention, being expected to make great contributions to energy conservation by being used in air conditioners, hybrid electric vehicles (HEVs) and electric vehicles (EVs) to minimize power loss. As such, demand for power semiconductors is expected to increase for use in energy-related devices. For the manufacture of power semiconductors, thermal processing equipment for 200mm wafers is more suitable than leading-edge equipment for 300mm wafers, as the former provides benefits such as low production cost and stable quality. Accordingly, operation has resumed for some equipment for 200mm wafers that was formerly idle, and the expansion of existing equipment for 200mm wafers has also been promoted around the world. While low-cost, second-hand equipment for 200mm wafers was available in the industry, the second-hand market is now facing supply constraints. In response, we have newly developed a vertical-type furnace for 200mm wafers that is equipped with the latest functions. This product is widely adopted by a lot of customers.



“VERTEX®* Revolution” batch thermal processing equipment for 150mm and 200mm wafers

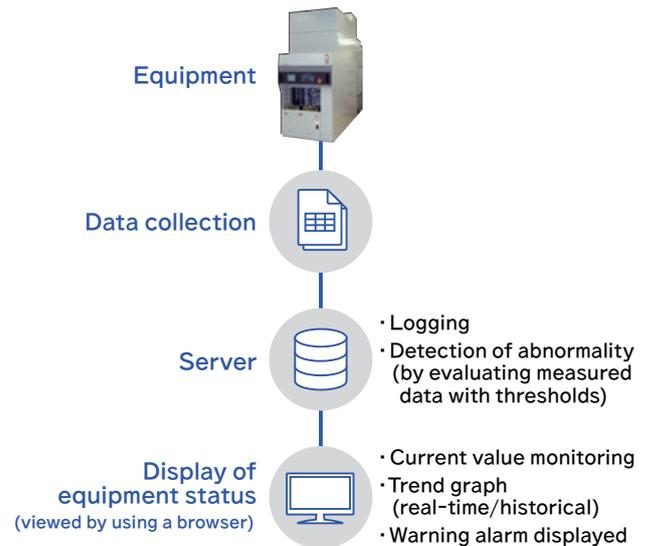
* VERTEX is a registered trademark of the Company.

2 Provision of a System for the Stable Operation of Production Equipment

Kokusai Electric Semiconductor Service Inc. (KSS) developed a system to collect and monitor the data dispatched from the sensors installed in customers' production equipment. By accumulating the collected data, providing comparisons with past data, and performing follow-ups, the system helps customers watch the status of their production equipment for timely maintenance.

The system also helps customers minimize their equipment operation costs by preventing failure occurrence. Since it is not designed as a built-in component; the system can be attached to the equipment as an external component and its behavior is thereby not affected by the equipment controller. This system is structured for general use and can collect data not only from equipment made by a company but also from that made by different companies.

Status monitoring system



VOICE

Kenichi Takemura, Global Equipment Refurbishment and Service Department

Across the communication, IoT and other new business industries, priority tends to be given to reducing the production cost. Accordingly, we make proposals to provide customers with newly created value, win their trust, and contribute to the creation of a recycling society, including proposing the modification of our products currently used by the customers and the replacement of old models with the latest models as well as the introduction of refurbished thermal processing equipment for 200mm wafers.



VOICE

Hideyuki Miyoshi, Service Planning Department, KSS

While there is large demand for leading-edge semiconductor manufacturing equipment due to the development of new semiconductor devices, customers continue to use the same equipment that they have long been using for the manufacture of conventional devices. KSS makes proposals on how customers can maintain their production lines while improving the operability of the equipment so that they can continue to use it for years to come.

The general-use status monitoring system is equipped with a function to collect information necessary to maintain the semiconductor manufacturing equipment and prevent its aging. We analyze the collected data together with customers, thereby further improving the trust we have built with them by serving them over a period of years.

3 Conducting CIP* Activities to Assist Customers with Development, Mass Production, and Quality Improvement

Kokusai Electric Asia Pacific Co., Ltd. (KAP) has its head office in Hsinchu in the northern part of Taiwan. Hsinchu is known globally as home to a number of semiconductor companies and is called the “Silicon Valley of Taiwan.” With service bases in Linko in Taipei, Taichung, and Tainan, KAP provides leading semiconductor device manufacturers with after-sale services for the Company’s vertical furnaces and single wafer furnaces. The sales, service and management staff are working as a united team to serve customers by communicating closely with them, which occurs on a daily, weekly and monthly basis to identify customer needs, including potential needs, as soon as possible. By meeting these needs appropriately and speedily, we are helping customers promptly develop and mass-produce advanced semiconductor products and improve their quality.

* CIP stands for continuous improvement process.

VOICE

C. C. Wang,
Linko Service Center, KAP

In our CIP activities, we were given a high score from a leading customer in the Linko district. The customer appreciated our quick identification of the problems they faced by sharing equipment information among our bases and our daily services. We will continue to serve customers by setting even higher targets.



4 Developing a Resistivity Measurement System Equipped with an Automatic Wafer Transfer Machine

Kokusai Electric Semiconductor Service Inc. (KSS) develops, manufactures, and sells resistivity measurement systems. Resistivity measurement systems are used to measure the resistivity of semiconductor wafers, etc. In addition to the desktop (manual) type, we developed a full-automatic type that transfers wafers automatically. KSS’s resistivity measurement system for 300mm wafers, which is equipped with an automatic transfer machine, is adopted by a number of leading-edge factories in Japan and overseas.

We have also developed and commercialized a compact system in response to customers’ needs for full-automatic measurement systems for 200mm and smaller wafers with a smaller footprint to save space at their factories. We will continue to meet our customers’ needs by developing even better products.



Resistivity measurement system equipped with an automatic transfer machine for 200mm and smaller wafers

VOICE

Kazuhiko Kinoshita, Engineering Department,
Applied Electronics Division, KSS

Resistivity measurement systems are used to manage the quality of products in the semiconductor manufacturing process. These systems thus play an important role in the manufacturing process and we aim to achieve higher measurement performance and develop new systems in response to customer needs, thereby contributing to their value creation.

TOPICS

PQS Award Received from Intel Corporation

We received a 2018 Preferred Quality Supplier (PQS) award from Intel Corporation.

“Intel’s award winning suppliers are critical to Intel’s success,” said Jacklyn Sturm, corporate vice president and general manager of Global Supply Management at Intel. “As we grow into new markets with evolving and expanding product quality and performance requirements, these suppliers continue to rise to the challenge to collaborate, innovate and win together.”



PQS award ceremony
Photo provided by Intel Corporation

VOICE

Tsuyoshi Okamoto,
North America & Europe Sales Department

We have been a recipient of the supplier award for 15 years in a row and the last PQS award is the 18th supplier award granted to us by Intel. We feel very honored to receive the award in recognition of our efforts to fulfill our role as supplier, such as ensuring quality. We hope to make further improvements so that we can continue receiving the award.

Prizes in VLSI Research’s Customer Satisfaction Survey for 22 Consecutive Years

In May 2019, the Company was awarded prizes in two categories—The “10 Best”^{*1} and “THE BEST”^{*2} in the annual customer satisfaction survey on semiconductor manufacturing systems conducted by U.S.-based market research company VLSI Research^{*3}.

This is the Company’s 22nd consecutive year winning the 10 BEST award as a result of it having earned a high evaluation for technical leadership and the high levels of product performance and quality of its equipment.



The official logos for the Awards won^{*4}

*1 The “10 BEST”: The 10 BEST awards are for large chip making equipment manufacturers as a whole.

*2 “THE BEST”: THE BEST awards recognize more defined markets for each manufacturer. The Company was awarded in the “Suppliers of Fab Equipment” and “Suppliers of Wafer Fab Equipment to Foundation Chip Makers” categories.

*3 VLSI Research: VLSI Research is a provider of customer satisfaction surveys and market analysis and has an established reputation for providing analysis on the technical, business, and economic aspects of the semiconductor supply chain.

*4 The official logos for the Awards won are registered trademarks or trademarks of VLSI Research Inc.