R&D and Intellectual Property

Activities in the Fiscal Year Ended March 31, 2018

The Kurita Group has contributed to solving various problems facing society and customers through its products and services. These have been developed by leveraging the high technological capabilities that Kurita has accumulated in the water and environment fields over many years.

In the fiscal year ended March 31, 2018, the Kurita Group worked to increase the added value of its products and services by developing water treatment technologies that help to save water, save energy, reduce environmental impact, and increase productivity at customers' plants. Other activities included developing wastewater reclamation and reuse technologies the designed for a recycling-oriented society and improving quality of our ultrapure water for application in the electronics industry. In our developments that anticipate future needs, we promoted joint research on next-generation semiconductor process technologies with overseas research institutions. In addition to these product and technology developments, we also cultivated core technologies such as analysis and evaluation technology and elucidation of water treatment mechanisms, as well as taking on development of advanced technologies including new materials.

We also strengthened our global research and development system with a view to expanding the Group's overseas business base. In April 2017, we established Kurita R&D Asia Pte. Ltd. as a base for research and development related to wastewater reclamation and sea water desalination in Singapore, which has a concentration of universities, research institutions, and corporate research and development facilities that are involved in researching technologies related to water and the environment. Here, we have started development of products and technologies for desalination plants and sewage recycling facilities that will address global demand for securing water resources.

Achievements in the Fiscal Year Ended March 31, 2018

Research and Development Bases	Kurita Global Technology Center (Japan), Kurita Europe GmbH (Germany), Kurita R&D Asia Pte. Ltd. (Singapore)	
R&D staff	Approx. 180	
R&D expenses	Fiscal year ended March 31, 2018 result: Approx. ¥5.3 billion (2.2% of net sales)	
Main Results	Water Treatment Chemicals	• Development of technology to prevent clogging of reverse osmosis (RO) membranes for seawater desalination facilities and wastewater reclamation facilities • Development of low phosphorous and non-zinc chemicals for cooling water to comply with environmental regulations • Development of chemicals for paper pulp process to prevent bleeding of ink
	Water Treatment Facilities	• Development of transportable high-speed coagulation and sedimentation system • Development of microbial selenium removal system for coal-fired power plants • Development of material cleaning and surface modification technology for next-generation semiconductors • Development of optimal control and operation support technologies for water supply facilities utilizing IoT and AI

Initiatives under the New Medium-Term Management Plan, MVP-22

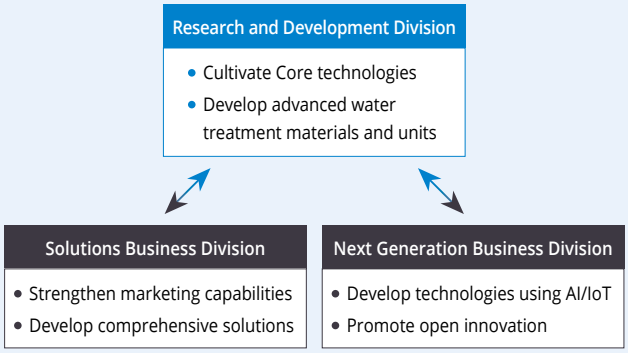
Under the MVP-22 plan, the Kurita Group is focusing on three priority themes for developments: "development of solutions," "development of advanced technologies," and "cultivation of core technologies," aiming to provide original products and services that will help to increase our customers' corporate value and competitive capabilities, and contribute to solving social issues.

In "development of solutions," we aim to develop total solutions technologies that provide greater added value by applying our diverse products and technologies to optimizing customers' plants and production processes. Working with the marketing department within the Solution Business Division, we will strengthen our marketing activities so that we can identify customers' latent issues as well as their emergent ones, using this information in our development work. We will also make full use of our development bases in Japan and overseas, pooling the Group's human resources, technologies, and expertise to enable speedy development of products and technologies in response to global needs.

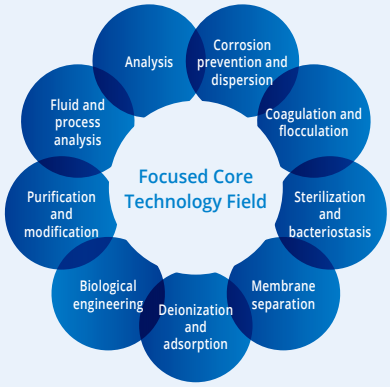
In "development of advanced technologies," we are working to realize production process optimization and automated control of water treatment systems using IoT and AI, as well as advancing development of strongly original high-function, high-performance materials and water treatment units. In these initiatives we are actively engaging in open innovation with research institutes and venture companies that have advanced technologies in order to achieve rapid and efficient development.

In "cultivation of core technologies," as a water treatment technology specialist we will continue to focus on researching core technologies such as water-related analysis and assessment technologies and elucidation of water treatment mechanisms. At the same time, we will add new themes aimed at improving the efficiency and completeness of our product development, such as "fluid and process analysis," in a bid to strengthen our analysis capabilities based on engineering theory.

Links between the Research and Development Division and the Next Generation Business Division and Solutions Business Division



Cultivation of Core Technologies



Utilization of Intellectual Property

The Kurita Group strives to secure and properly manage intellectual property with the aim of increasing the competitiveness of its core products and technologies in Japan and overseas.

In the fiscal year ended March 31, 2018, the number of patent applications made by the Group in Japan increased by 38 from the previous fiscal year to 193, mainly as a result of efforts to secure rights for a new business model and strategic patent activities. We applied for patents on new business models for biomass power generation and "KWSS" (Kurita Water Supply Service), a service for supplying pure water to the small and medium-sized pure water treatment equipment market. In strategic patent activities, we formulated a patent strategy for our core water treatment chemicals products based on our product development strategy and trends among our competitors. The number of patents held by the Group in Japan was reduced by 60 from the previous fiscal year to 1,644 after paring back our portfolio to focus on profitable patents.

The number of patent applications outside Japan increased by 23 from the previous fiscal year to 75, due to applications for patents overseas on a Reclaimed Water System and treatment chemicals for cooling water. As of March 31, 2018, the Group held 791 patents outside of Japan.

Furthermore, the Group continued the efforts made in the fiscal year ended March 31, 2017 to establish a centralized global intellectual property system and strengthened its centralized management of intellectual property activities to cope with global business expansion, such as establishing a policy on the handling of employee inventions at Group companies, including those overseas, and development of a system for dealing with patent litigation risk outside Japan. Going forward, we will aggressively pursue overseas patent applications while considering their commercial viability in each country.

Number of Patent Applications and Patent Registrations

For the years ended March 31