Research and Development

Research and Development Principles and Policies

Contributing to the world by applying chemistry-based technologies lies at the heart of Tokuyama's research and development philosophy. Guided by this philosophy, the Company adheres strictly to a process of internal and external collaboration in a bid to promote a customer-focused approach. At the same time, we endeavor to integrate new technologies drawing on the strengths of our inherently unique and specialist capabilities and engage in research and development activities with the aim of producing advanced materials that lead the world.

In order to take another step toward a research and development promotion structure that is committed to producing technologies and materials with genuine commercial application, we organized the research and development activities of the Research and Development Division into three broad groups, the Tsukuba Research Laboratory, the Tokuyama Research Laboratory and the New Business Promotion Dept., and two survey and inspection organizations, the Intellectual Property Dept. and Analytical Science Dept. from July 2017. At each laboratory, we undertake development with our eyes fixed firmly on end results (a genuine commercial outcome) in collaboration with business segments in the medical and healthcare- as well as ICT-related domains. The New Business Promotion Dept. manages market information on a centralized basis. This information is then used to uncover and anticipate customers' needs and the underlying platform to put forward new proposals. In addition, we recognize the need to help prevent global warming as an important issue. With this in mind, we will work to better coordinate related departments and division within the Company and pursue the development of new technologies.

Research and Development Bases

Tokuyama's two-pronged R&D structure comprises Tsukuba Research Laboratory in Tsukuba City, Ibaraki Prefecture, in Eastern Japan, and Tokuyama Research Laboratory in Shunan City, Yamaguchi Prefecture, in Western Japan.

Tsukuba Research Laboratory

The Tsukuba Research Laboratory is a development base that focuses on the medical and healthcare-related domain. The lab pursues leading-edge technologies from a medium- to long-term perspective, conducting research and development of analysis techniques as platform technologies, composite materials used especially in the field of dentistry, and high-value-added products targeting the organic fine chemicals field.

Tsukuba Research Laboratory

Tokuyama Research Laboratory

Tokuyama Research Laboratory

The Tokuyama Research Laboratory is a development base that focuses on the ICT-related domain. Spanning a wide variety of fields from basic chemicals to cement, the Laboratory engages in a broad array of research and development activities including basic research, application research, and the development of processes.

R&D Activities in Fiscal 2018

Based on our basic philosophy of "Centered on the field of chemistry, the Tokuyama Group will continue to create value that enhances people's lives ", Tokuyama is doing Research and Development with aiming to expand and develop each business based on chemistry, with priority areas being "Specialty Chemicals for ICT and Healthcare".

The Research and Development Division comprises a five-department system of the Tsukuba and Tokuyama research laboratories, the New Business Promotion Department, Analytical Science Department and Intellectual Property Department. In collaboration with business division development groups attached to each segment, the Research and Development Division is developing technologies for next-generation themes and themes related to existing businesses in the development portfolios of business divisions and Group companies.

From April 2018, the development of silica-related products and chloride-related products as well as semiconductor peripheral materials, which had been dispersed among multiple business division development groups, was concentrated in the Research and Development Division. At the same time, to strengthen the quality control of developed products, we established the Research & Development Quality Assurance Sect. within the Research and

Development Division. We also actively promoted collaborative research with universities and research institutes. In March 2019, the Taiwan Research Laboratory opened within the Industrial Technology Research Institute of Taiwan for the purposes of collecting information on IoT-related technologies and developing measurement technologies.

The main themes at the Tsukuba and Tokuyama research laboratories are the development of single crystal aluminum nitride substrates, semiconductor peripheral materials, organic and inorganic composite materials, nanoparticles materials, chlorine compound materials, medical materials, and veterinary peripheral materials.

The New Business Promotion Department engages in marketing in cooperation with internal and external organizations, fine-tuning its business strategies and proprietary technologies starting with customers, and is tasked with creating new themes in the fields of IoT and life sciences. The Intellectual Property Department contributes to the creation of new products and businesses and the expansion of group profits through its strategic intellectual property management capabilities, and the Analytical Science Department aims to contribute to the semiconductor peripheral materials business by advancing analysis and analysis technologies.

In fiscal year ended March 31, 2019, the Tokuyama Group's R&D spending totaled ¥8,052 million, including ¥1,962 million for basic research expenditures that are not allocable to a specific segment.

Below is a description of R&D projects underway and spending by segment.

Chemicals Segment
Tokuyama develops technologies to cope with needs of environmental load reduction of chlorine-related products, reduce costs by improving production efficiency, and maintain and improve product quality. With vinyl chloride resin, Tokuyama also strengthened its technical services to supply products according to customers' requests, and actively worked on developing new grades that make use of the findings acquired from technical service. In developing inorganic chemicals, Tokuyama focused on investigating marketability based on customer evaluation, improvement of physical properties and manufacturing process. The Company is also working on technological developments to produce hydrogen from renewable energy.

R&D expenditures totaled ¥ 279 million in the Chemicals segment.

Specialty Products Segment
With regards to silica, Tokuyama has upgraded its existing fumed silica products and developed new conformal silica, undertaken capital investment for developed products approved by customers, and accelerated efforts toward their commercialization. As for heat dissipating materials, in addition to aluminum nitride filler used in heat dissipation materials, such as power semiconductors and LEDs, Tokuyama has made preparations for the trial manufacture of boron nitride fillers and silicon nitride powder and made progress with customer evaluations. With regard to its high-purity chemicals for the electronics industry, Tokuyama enhanced its development system to meet the high purification needs associated with the miniaturization and three-dimensional process of semiconductor devices.

R&D expenditures came to ¥ 1,993 million in the Specialty Products segment.

Cement Segment
Tokuyama focused on the development of a variety of cement-based products. Wit regard to cement-based soil solidifiers, we actively worked on the development and improvement of various grades. In the case of building materials, we focused on developing products that have applications in the repair and reinforcement of concrete structures field, such as in cross-section repairing materials and in repair and reinforcement materials for road slabs. Focusing on applications outside of cement manufacturing processes, Tokuyama has concentrated on developing technologies to effectively use coal ash and waste gypsum boards. As basic research on cement, Tokuyama continued to examine the reduction of burning temperature of cement clinker from the viewpoint of energy saving.

R&D expenditures were ¥755 million in the Cement segment.

Life & Amenity Segment
We made progress developing next-generation photochromic dye materials for lenses-related materials. We also worked on the development of manufacturing processes for active pharmaceutical ingredients. In the healthcare and clinical testing fields, marked progress was made on the integrated development of products including diagnostic reagents and laboratory information systems, clinical analyzers, and laboratory automation systems. In the dental care field, continued steps were taken to develop products such as restorative composite resins, dental adhesives and dental resin composite block. In ion exchange membranes, progress was made on the development of high-efficiency bipolar membrane electrodialysis technology, highly functional ion exchange membranes, and other products.
R&D expenditures totaled ¥3,062 million in the Life & Amenity segment.