

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 our 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. 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.

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 2017

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".

In combination with the existing Analytical Science Department and Intellectual Property Department, the Tokuyama Group R&D Divisions consist of a five-department system after dividing the previous Corporate Development Department into the Tsukuba Research Laboratory, Tokuyama Research Laboratory, and New Business Promotion Department in July 2017. The purpose of this reorganization is to help accelerate development based on a clear responsibility-taking system and creating marketing functions based on successful Group development themes that anticipate customer/market needs and technological changes.

The Tsukuba Research Laboratory and Tokuyama Research Laboratory have continued to develop scintillator materials for neutron detectors, single crystal aluminum nitride substrates, and battery materials while also establishing new development themes for semiconductor peripheral materials, organic inorganic composite materials, nano particle materials, chlorine compound materials, medical materials, and veterinary peripheral materials. In November 2017, the

Company commenced domestic sales of livestock nipple protective material Teatner , which is the first product developed under the new system.

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.

In fiscal year ended March 31, 2018, the Tokuyama Group's R&D spending totaled ¥7,903 million, including ¥1,564 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.

R&D expenditures totaled ¥ 627 million in the Chemicals segment.

Specialty Products Segment

Regarding polycrystalline silicon, Tokuyama upgrades and develops technologies in order to both improve the purity and quality of polycrystalline silicon for semiconductors as well as reduce costs through more efficient production.

With regards to silica, Tokuyama has not only upgraded its existing fumed silica products, but also developed new conformal silica to meet customer requests.

As for heat dissipating materials, in addition to aluminum nitride and boron nitride fillers used in heat dissipation materials such as power semiconductors and LEDs, Tokuyama has begun developing silicon nitrides.

With regard to high-purity chemicals for the electronics industry, Tokuyama has redoubled its efforts to continually reduce impurities.

R&D expenditures came to ¥ 1,958 million in the Specialty Products segment.

Cement Segment

Tokuyama has continued to aggressively pursue R&D in the use of various wastes as raw materials and fuels for the production of cement. In particular, Tokuyama focused on exploring substitutes for coal. 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. As cement-related products, Tokuyama promoted development and improvement of various building materials products applied to repair and reinforce concrete structures such as cross section repairing materials, development and improvement of various grades of cement-based soil solidifiers.

R&D expenditures were ¥712 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 ¥3,039 million in the Life & Amenity segment.