Research and Development

Performance Against Materialities / KPIs (FY2023)

Creating and providing environmentally friendly products, and products that reduce health risks

New Product Development

Secured 138 patents (domestic and overseas / as of the end of August 2024)

Implementing communication and exchange with customers to address society's problems

Training participation (once a year)

Research and Development Policy

To contribute to resolving societal issues regarding "the environment," "air quality," and "health," we have positioned construction machinery filters and air filters as the two domains at the core of our research and development efforts aimed at creating high-value-added products as a comprehensive filter manufacturer.

Research and Development System

As a comprehensive filter manufacturer, we keep speedy research and development in mind as we develop products that reflect our customers' requests and society's needs. In accordance with research and development regulations, we consolidate planning and development proposals in the Research & Development Division, where they are converted into projects. The feasibility of moving forward with a project is then determined through design reviews and conferences with the participation of top management.

We have approximately 70 employees involved in research and development work, making this department the second largest to the Production Division. In the Yokosuka Innovation Center, which started operation in February 2022, we consolidated units that had been spread out among the Yokohama (Sugita) Development Center and Yokosuka Media Lab. Some staff have also been allocated to the Saga Branch Office and the Suzhou Development Center in China.

The research and development site comprises a division that provides core support for the group, with responsibility for development from a medium-term perspective (new product development) in which the Development Design Department and the Research & Development Department envision product lines one to five years in the future, as well as (basic) research from a long-term perspective to cultivate technologies that are essential to us as a manufacturer. In FY2023, in order to reinforce trend-conscious development we have strengthened our system for elemental technologies in the Research & Development Department, including new exploration. In the Development Design Department as well, we carried out a restructuring within the organization, including strengthening the system to improve quality and cost.

Setting Research and Development Goals

For our FY2023 research and development targets, we adopted the theme of developing next-generation model filters, and we worked to produce results in this area.

Major FY2023 Development Themes

- Low-pressure-loss filters for construction machinery
- Development of filters for the next generation of product models (aeration measures, etc.)
- ICT filter development (contamination level sensors, differential pressure sensors, etc.)
- Development of products utilizing nano-fibers, etc.

Promoting Research and Development That Captures Our Customer's Needs

Our Research & Development Division and Sales Division work together to communicate promptly with customers every day so that we can reflect the needs of our customers in our products. After the COVID-19 pandemic, we resumed in-person visits in FY2022, and have conducted training sessions on filters at our sales office in Thailand in an effort to deepen communication with customers.

Philosophy on Intellectual Property

In "(3) Protecting and respecting intellectual property rights" described in our Corporate Code of Behavior, we adopt a policy of respecting and not infringing on the rights and property of others, including intellectual property. Under our company motto of "Contributing to filter technology innovation and to addressing society's problems," we have made sufficient development investments into the likes of equipment at our research and development sites. Having identified "environment, "air quality," and "health" as societal issues that we must help solve, we have positioned construction machinery filters and air filters at the core of our research and development efforts aimed at creating high-value-added products as a comprehensive filter manufacturer. Also, with regard to our core technologies and so on brought about by the exclusive development efforts of our group, we will enhance our protection of intellectual property and brand power by making our know-how confidential and acquiring intellectual property rights.

Research and Development

Intellectual Property Management System

Intellectual property-related activities are promoted mainly by the Research and Development Division and Legal Division, with personnel assigned at our Head Office and Yokosuka Innovation Center. The Intellectual Property Strategy Review Meeting, which is held every month, sees approximately 20 attendees including the Representative Director/President, the Director/Senior Executive Vice President, the Director/Senior Managing Executive Officer, Development Division Manager, Sales Division Manager, Quality Assurance Division Manager, and Research & Development Division and Legal Affairs Department members, and discusses the state of and strategies for intellectual property management.

Number of Patents Held

Patent acquisition is necessary for eliminating counterfeit goods circulating in the market, and so we see this as one intellectual property strategy to help increase our corporate value. We have patents for our filter structures and filtration media manufacturing methods and equipment, totaling 138 patent acquisitions as of the end of August 2024.

We are striving to acquire patents to improve our competitiveness, and are undertaking initiatives with an awareness of leveraging the intellectual property landscape.

Intellectual Property Education and Training

We hold intellectual property training annually for employees. New employees undergo intellectual property training as part of their new employee training. For those in charge of managing intellectual property, as well as on-the-job training, we also hold more specialist training for them to learn about domestic and overseas intellectual property rights. In FY2023, we held this training a total of three times.

FY2023 Intellectual Property Training (number of sessions)

Training theme	Eligible trainees	Number of sessions
Intellectual property protection	Employees of Sales Division, Production Division, and Saga Branch Office	2
Joint development agreements (Act on Prohibition of Private Monopolization and Maintenance of Fair Trade)	Employees of R&D	1

Employee Invention Program

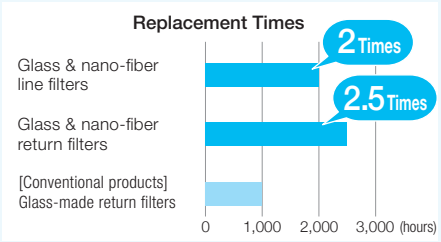
We have formulated Employee Invention Handling Regulations, which stipulate the process of handling employee inventions from the occurrence of the invention through to paying compensation to the employee. These regulations also stipulate to pay the employee responsible for the invention a reward when submitting a patent application, registering a patent, and commercializing the invention.

TOPICS Environmentally Friendly YAMASHIN-FILTER Products

Extending Long-life Filter Service Life Even Further

Return filters and line filters for large-scale construction machinery that use nano-fibers help reduce waste because of their major extensions of service life. While the replacement time for return filters is 1,000 hours*, those made with glass and nano-fiber have replacement times of 2,500 hours, and with line filters as well, this effect of nano-fibers also enables a longer service life of 2,000 hours with the same excavator.

*Filter products using glass fiber only



NanoWHELP® Air Filters Contribute to Reducing CO_2 Emissions

Incorporating nano-fibers, NanoWHELP® has earned a strong reputation for filter performance and environmental friendliness (approved under U.S. MERV14 standards). Used in data centers, hospitals, and public facilities, NanoWHELP95 can reduce CO_2 emissions by 23% per year* compared to our company's other products. In FY2022, NanoWHELP® sales volume was six times greater than in its first year, and we will continue to expand its adoption as a product that protects health in all kinds of settings.

*Third-party assurance obtained