



Research & Development

Yokohama Rubber is working to develop high-quality tires using innovative technologies based on changing needs. While pursuing performance improvements such as durability, safety, and fuel efficiency, we test and evaluate the behavior and performance of tires under various conditions in Japan and overseas. We are also focusing on research into the use of sustainable materials, weight reduction, and recycling technologies, and are promoting the manufacture of environmentally friendly products. The results of our R&D lead to improved tire performance and reduced environmental impact, contributing to the safety and sustainability of the automotive industry as a whole.

Relevant material issues	Initiatives
 Products	<ul style="list-style-type: none"> • Manufacturing and selling tires and industrial materials with advanced safety, quality and environmental performance • Manufacturing and selling carbon neutral products • Developing products and services utilizing AI and IoT (wear detection, road surface detection, tire management and damage prediction) • Manufacturing and selling tires for industrial and construction vehicles supporting social infrastructure and tires for agricultural and forestry machinery supporting natural capital
 The Earth	<ul style="list-style-type: none"> • Achieve carbon neutrality of our own activities by 2050 • Achieve 100% usage of sustainable raw materials by 2050

Basic Policy on Research & Development

The Yokohama Rubber Group's research and development involves taking on challenges on the forefront of global technology and providing pioneering, world-first products to the market. On our frontline of research and development, we engage in multi-faceted and comprehensive research and development activities from material development to product design, testing and evaluation along the themes of

ingenuity, application and greater sophistication of technologies, and pursue the possibilities of various technologies and products, including rubber polymer technologies. In addition, outside the field of tires, we use innovative ideas unconstrained by conventional thinking and cutting-edge technologies to pursue the development of new materials and the design of products with a view toward the next generation.

Research & Development Promotion System

Under the idea of "local production for local consumption," Yokohama Rubber is strengthening tire research and development activities in regions close to major markets in Japan and overseas. Utilizing our global R&D system close to consumer areas, such as the Tire Test Center of Asia in Thailand, the Yokohama China Technical Center in China, and the Yokohama Development Center America in North Carolina, United States, we are able to quickly launch new products suitable for each market.



Evaluating Tires Around the World to Guarantee Performance

In order to verify tire performance, we have set up test courses in consumer areas in Japan and overseas to utilize information on the actual local climate and environment in our products, and are earnestly working on research from all angles such as safety, drivability, and comfort. The enormous amount of data obtained from driving tests at Yokohama Rubber's comprehensive tire test courses at the Daigo Proving-ground and Research Center (D-PARC, Ibaraki) and the Tire Test Center of Asia (Thailand), the Nürburgring Test Center (Germany) and winter tire test courses at the Hokkaido Tire Test Center and Yokohama Test Center of Sweden is sent instantly to the

Research and Development Integrated Center (RADIC) at the Hiratsuka Factory in Hiratsuka City, Kanagawa Prefecture, where it is used to improve tire performance and develop next-generation tires.



Comprehensive tire test course at D-PARC (Ibaraki Prefecture)



Winter tire test course at Yokohama Test Center of Sweden

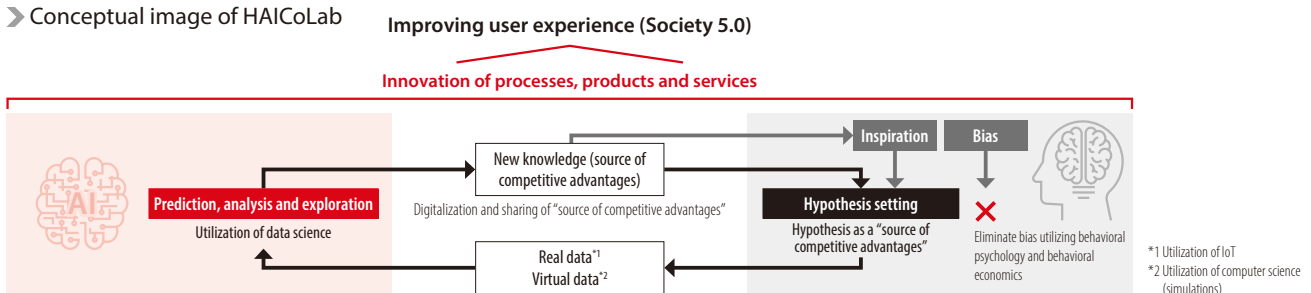
HAICoLab* AI-powered data utilization framework

For more than a decade, Yokohama Rubber has been developing technologies to apply computer science and machine learning to the development of materials. The HAICoLab, which came on line in 2020, is our proprietary AI-powered data utilization framework that combines simulation technologies and AI technologies and also focuses on human characteristics. We aim to promote new discoveries through “human-specific inspiration” and “creativity” and

“collaboration between the enormous data processing capabilities that AI excels at” aimed at non-continuous and radical innovation. The new knowledge gained by generating and collecting virtual data from real data and simulations, and predicting, analyzing, and searching with AI is being utilized for innovation in tire technology development.

*A coined term based on “Humans and AI collaborate for digital innovation.”

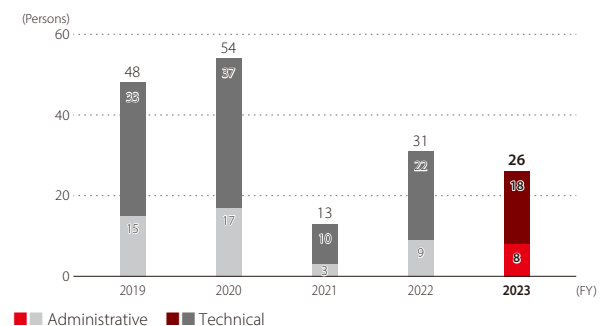
Conceptual image of HAICoLab



Securing and Developing Talent in Development

Yokohama Rubber strives to secure human resources stably in technology development as core human resources to maintain our strengths of high technology and innovation. In the recruitment of new graduates, we maintain strong cooperation with universities to ensure stable recruitment every year. We also hire a wide range of mid-career employees. Of the number of new graduates hired in fiscal 2023, 18 were technical personnel, while six of the mid-career hires during the year were also technical personnel. In addition, the Yokohama Techno Forum (YTF), which is held as an opportunity to share knowledge and raise awareness of internal technology research, was held 38 times in 2022.

New graduate recruitment



Intellectual Property

Intellectual property activities are an important investment in the protection and development of our business. We are conducting intellectual property activities to strengthen high value-added products, carbon neutrality, and circular economy, among others, which are covered under the policy of YX2023. In addition, we promptly reflect the status and direction of our business in activities such as the acquisition and utilization of rights such as patents, designs, and

trademarks, and efficiently and proactively carry out activities such as the acquisition of rights in cooperation with business departments. As a result, the number of domestic and overseas patent rights held during the previous management plan (GD2020) increased by more than 10%. At least once a year, we report on the status of intellectual property strategies and activities at meetings attended by members of executive management with technical expertise.

Future Issues and Measures

At Yokohama Rubber, one of our challenges is to make more effective use of the vast amount of research and development data (actual product and lab sample test results, simulation results, manufacturing and processing conditions, etc.) that we have accumulated

to date. This is an area that we are now working to address. In the future, we will develop a foundation that makes it easier for engineers to use this data, leading to the improvement of individual skills, new awareness, and quantification of tacit knowledge (skill transfer).