

03

Mid- to Long-Term Growth Strategies and Resource Allocation

Strengthening Internal Capital: Intellectual Capital -Strengthening Technological Capabilities-

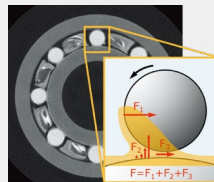
NSK's Four Core Technologies + Manufacturing Engineering

NSK has relentlessly pursued innovative technologies and focused on improving quality to contribute to a safer, smoother society and to protect the global environment, in line with its corporate philosophy. NSK leads the world in the product fields of bearings, automotive components, and precision machinery and parts. Its technological foundation consists of tribology, materials, numerical simulation, and mechatronics, which are NSK's Four Core Technologies, and manufacturing engineering which gives them shape. Our goal is to be a company that is needed, trusted, and relied upon by society. To this end, we will continue to contribute to the creation of a sustainable and more prosperous society and protect the global environment by saving energy and reducing CO₂ emissions while creating and supplying high-performance and highly functional products to the market in a timely manner.

Four Core Technologies + 1

Studying, Clarifying, and Controlling Friction Tribology

Tribology is the study of friction and wear of contact surfaces in relative motion, such as rotating parts that endure enormous forces with a thin oil film. Severe operating conditions are mitigated through lubrication and surface treatments, resulting in superior performance for applications requiring low friction, high-speed rotation, quiet operation, or enhanced durability.



Friction on the bearing's ball surface

Unrelenting Pursuit of Performance Durability and Reliability

Materials

Materials research and development affects nearly every aspect of product performance. We are constantly pursuing cost and productivity while meeting ever-evolving demands for improved functionality, durability, and reliability through technologies that utilize metals, polymers, and ceramics with optimized material composition and heat treatment conditions.



Bearings utilizing ceramics and resins

Giving Shape to Four Core Technologies

Manufacturing Engineering

Contributing to the environment and heightening safety and security through our Four Core Technologies requires something to breathe life into these technologies. In addition, it is essential to consistently manufacture products with high quality. NSK tackles these issues by applying smart technology to its equipment, utilizing IoT, and optimizing its overall production framework while it works to realize the creation of smart factories that economize on space, save on energy, and reduce labor requirements.



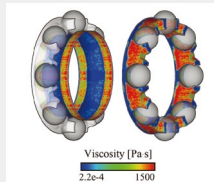
Cheonan Plant in South Korea

FOUR Core Technologies

+1

Reproducing Phenomena in Virtual Space and Predicting Performance Numerical Simulation

In the past, accuracy and reliability in product development were achieved with experience-based design and longer testing periods. NSK's simulation technology allows virtual validation to accelerate design and production. Extreme conditions or innovative designs that defy previous expectations can also be evaluated and analyzed.



Example of bearing grease flow analysis

Technology That Supports People for a Convenient, Safe, and Comfortable Future

Mechatronics

Mechatronics integrates machine element technology with control technology. By combining bearings, ball screws, and linear guides, together with motors, sensors, and computers, greater mechanical functionality is elicited with computer control. This technology enables new functions and performance in a range of industrial machinery, automotive, and biomedicine applications. It also contributes to greater reliability, as well as to convenience and safety in daily life.



Active Caster

Unleashing the Creativity of Engineers to Create Out-of-the-Box Solutions

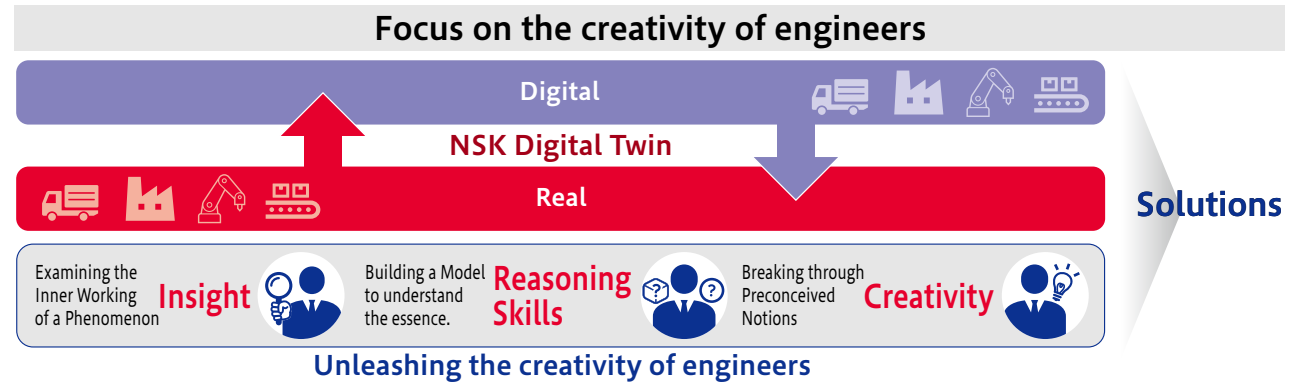
NSK is committed to NSK Digital Twin, which provides new value to society by maximizing the use of digital technology. In contrast to a conventional digital twin, which reproduces and analyzes real-world phenomena in a virtual space based on data, NSK Digital Twin is also a problem-solving framework focused on enhancing the creativity of engineers. NSK Digital Twin serves to better ascertain the essence of a phenomenon and grasp it in detail through a process of reproduction and analysis in order to deduce the underlying mechanism and model it digitally to understand the essence of what we cannot see. Through these means, progress can be made toward creating new out-of-the-box solutions.

NSK developed approximately 150 projects in FY2021 and more than 250 projects in FY2022, promoted processing improvements, and developed products that respond to rapidly advancing technological innovations such as electrification and automation. For high-speed

rotary ball bearings for automobiles, dmn, which is an indication of rotational performance, improved from 800,000 to more than 2,000,000. The development of this product would have taken 20 years in the past, but the NSK Digital Twin concept made it possible in only two

years.

NSK will continue to hone tribology through the concept of NSK Digital Twin to provide new value and to solve technological issues in a manner unbound by convention or precedent.



Creating New Value through Co-Creation

In research and development, we are working to enhance the commercial strength of existing products and expand new products and businesses under the Bearings & Beyond initiative in MTP2026. Against the backdrop of rapid global technological innovation, NSK is actively participating in joint projects with universities and other companies to accelerate technological innovation through open innovation.

In March 2023, we signed an agreement with the Tokyo Institute of Technology to establish a research center. The goal is to put in place a system and research environment that enables continuous innovative technology development by combining the strengths of both entities. We will also work to develop human resources capable of promoting advanced fundamental research.

As part of our efforts to expand new products and businesses, and in similar fashion to FY2021, we participated in a Kanagawa prefectural government project to implement

robotic technology in hospitals to help prevent the spread of COVID-19 in FY2022 and conducted field tests using our transport assist robot to move patients on stretchers. In addition, NSK has initiated collaboration with Cyfuse Biomedical K.K., a leader in the field of regenerative medicine, which is attracting worldwide attention, in the development of new technologies in the field of regenerative medicine and cellular therapy products, in an effort to accelerate the practical application and sophistication of regenerative medicine.

Through these open innovation efforts, NSK will promote technological innovations that provide new value to society by integrating the diverse knowledge, technologies, and human resources of leading-edge research institutions and different industries in Japan and overseas.



Monitoring a transport assist robot in a hospital

Protecting Technology and Contributing to Business Development

Intellectual property activities are essential in developing a business and ensuring profitability.

We consider business, technology, and intellectual property in an integrated manner. Rather than focusing solely on the number of patents, we place considerable emphasis on securing high-quality patent rights that will contribute to future business operations through collaboration between the technology and intellectual property departments. At the same time, we recognize patent information as big data and visualize the data to contribute not only to a patent strategy but also to technology development strategy and even to business strategy.

Drawing on the many registered patents we hold as management resources, we will acquire patent rights that support NSK's global business development, protect NSK's technologies for the future, and contribute to the development of the Company's business.