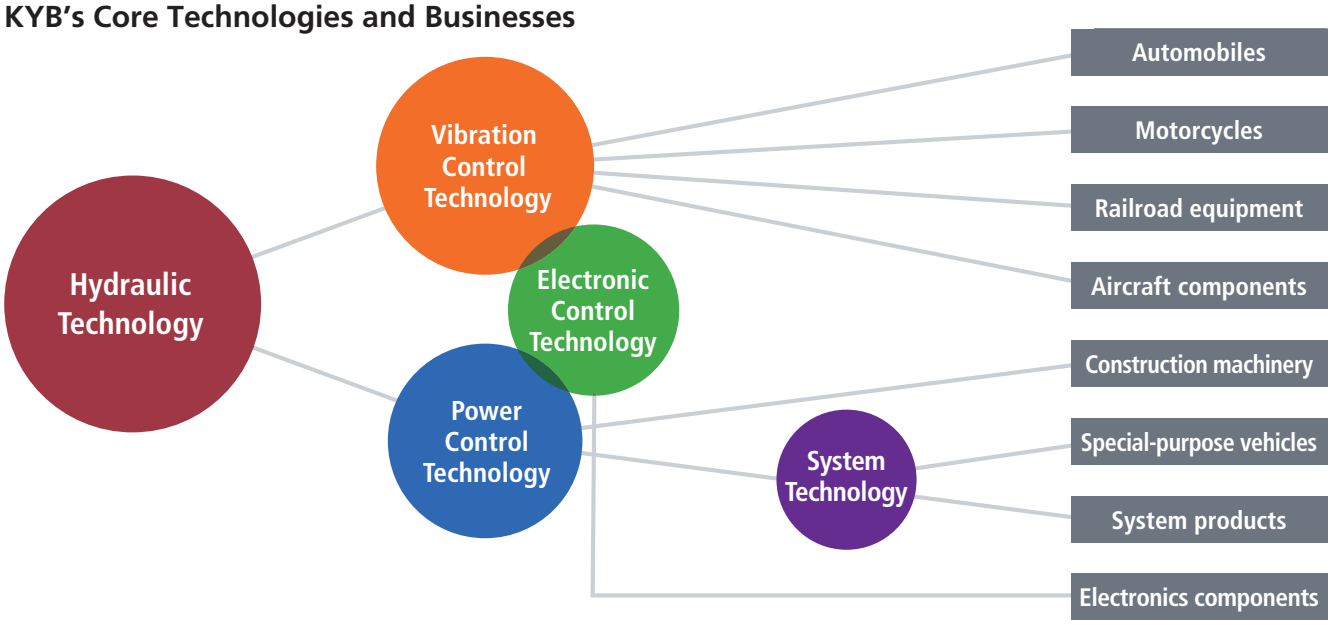
KYB Group Business Overview

KYB provides products to customers in various fields by combining electronic control and systems technologies that apply its two core technologies for vibration control and power control. KYB's business and product segments are divided into Automotive Components Operations, Hydraulic Components Operations, the Special-Purpose Vehicles Division, the Aircraft Components Division, and the System Products and Electronic Components Business.

KYB's Core Technologies and Businesses



Main Businesses

Automotive Components Operations

Ultra-low velocity valves for shock absorbers

Air-oil-separate system (AOS) for the front forks of motocross motorcycles

This business primarily develops and supplies a wide variety of products for automobiles and motorcycles. Leveraging vibration control technology, it serves market requirements for comfort, safety and maneuverability in day-to-day driving and motorsports.

Major Products

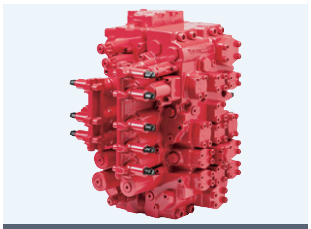
Shock absorbers for automobiles: Shock absorbers (original equipment (OE), aftermarket)

Shock absorbers for motorcycles: Front forks, rear cushion units

Hydraulic equipment for automobiles: Vane pumps, vane pumps for continuously variable transmissions (CVT), hydraulic power steering systems, electric power steering (EPS)

Others: Stay dampers, shock absorbers for all-terrain vehicles, free locks

Hydraulic Components Operations



Control valves

Active suspension systems for railroad cars

This business develops and supplies a variety of hydraulic equipment for construction machinery, industrial vehicles and railroad cars. It also leverages vibration control technology to meet the needs of onsite *monozukuri* and railroad infrastructure for precision miniaturization, digitalization and systemization.

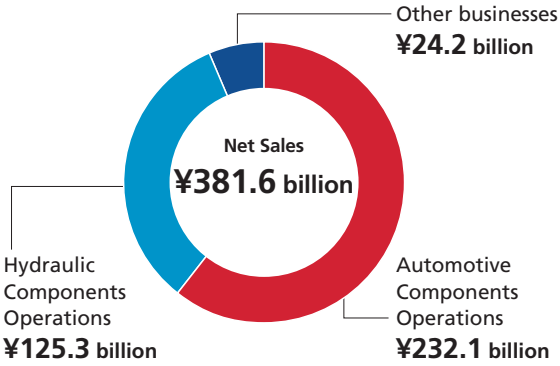
Major Products

Hydraulic equipment for industrial use: Cylinders, valves, pumps, motors, mini-motion packages (MMP), hydrostatic transmissions (HST)

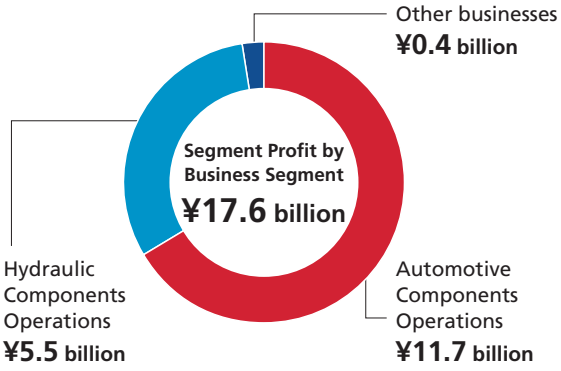
Others: Dampers for railroad cars, brakes for railroad cars, active suspension systems for railroad cars, seals

Sales Composition by Product for Fiscal 2019 (Consolidated)

Net Sales by Business Segment



Segment Profit by Business Segment*

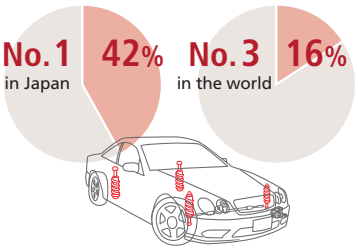


* Segment profit corresponds to operating profit under JGAAP

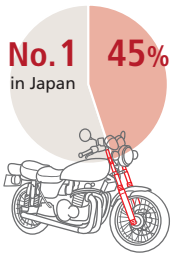
Market Share of Major Products

Source: KYB data (As of March 31, 2020)

Shock Absorbers

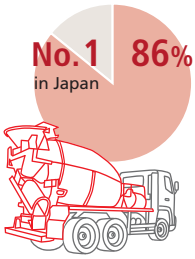


Motorcycle Front Forks



Hydraulic Cylinders

Concrete Mixer Trucks



Other businesses (system products, aircraft components, special-purpose vehicles, electronic components, etc.)

Concrete mixer trucks

Actuators for aircraft

Chair ski shock absorbers for disabled skiing

Floor equipment

• Special-Purpose Vehicles Division
This business develops and manufactures special-purpose vehicles, focusing on a lineup of small to large concrete mixer trucks that have the largest market share in Japan. The excellent mixing, discharging, environmental performance and other features of our products boost work efficiency.

• Aircraft Components Division
This business supplies flight control systems, landing systems, hydraulic and pneumatic systems and other hydraulic equipment for aircraft. In the aerospace technology market, which requires outstanding reliability, we leverage cutting-edge hydraulic technology to support flight safety and comfort.

• System Products and Electronics Components Business
We are opening up new possibilities for hydraulic technology, such as auditorium and stage control systems that support theater performances. In addition to hydraulic technology, we are also focusing on electronic control technology to develop products such as electronic control units (ECU) for automobiles and other uses.

Major Products

System products: Theater equipment, equipment for military vessels, seismic isolation and vibration suppression devices, simulators, hydraulic systems, tunnel boring machines, and environmental devices

Aircraft components business: Devices for take-off and landing of aircrafts and steering components, control devices, and emergency equipment

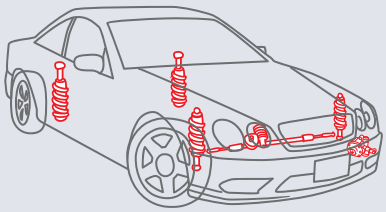
Special-purpose vehicles: Concrete mixer trucks, granule carriers, special-function vehicles

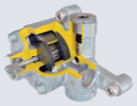
Electronic components, etc.: Electronic devices

Product Lineup

We support daily life by providing safety and comfort. The products presented here are used in a broad range of fields.

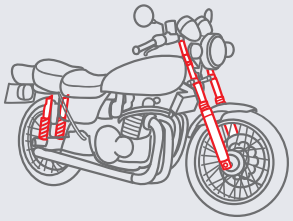
Automotive





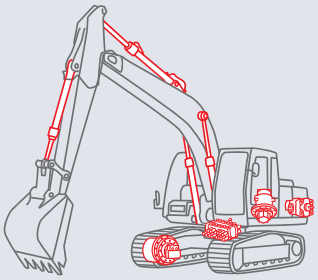
KYB makes automotive components that give users the drivability they want in any situation, from a family outing to a challenging motorsports event.

Motorcycles



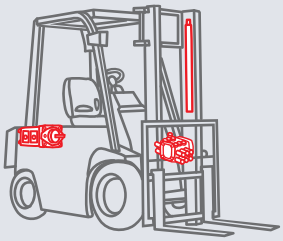
KYB makes motorcycle components for the highest level of riding stability and superior maneuverability by using race-proven technology designed for extreme speed and safety.

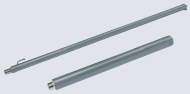
Construction Machinery



KYB construction machinery components are widely incorporated in equipment used at construction sites under severe conditions.

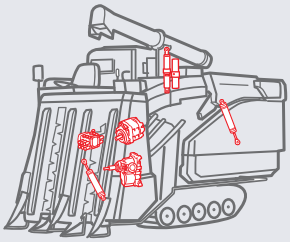
Industrial Vehicles





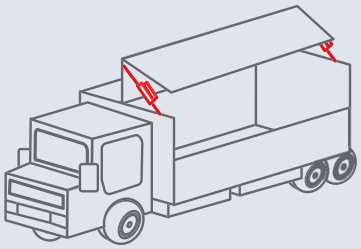
KYB puts its components to work in forklifts and other industrial vehicles to provide powerful support for improved operational efficiency.

Agricultural Machinery



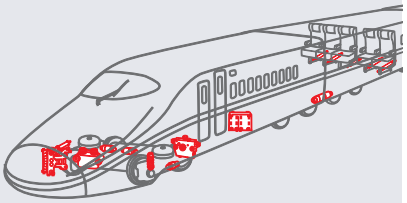
KYB agricultural machinery components save space and energy for easier farming.

Industrial Machinery



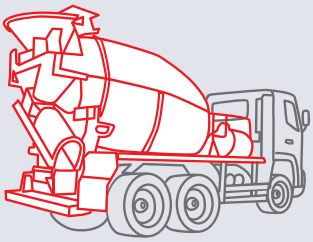
KYB supplies components for industrial machinery from elevators to factory equipment to help accelerate production.

Railroad Equipment



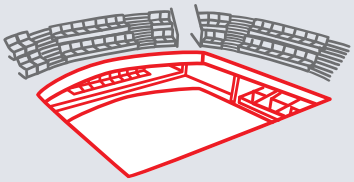
KYB railroad equipment helps achieve comfortable high-speed travel by buffering rolls from air pressure when cornering, passing oncoming trains or entering tunnels.

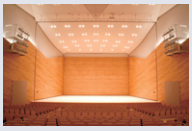
Special-Purpose Vehicles



KYB special-purpose vehicles support comfort in all environments. KYB concrete mixer trucks have the highest market share in Japan.

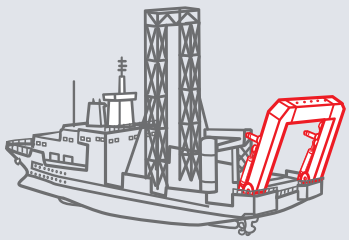
Theater Equipment and Equipment for Theater Construction





KYB technology supports theatrical productions by providing rigging, acoustic reflectors and other essential equipment for performance venues.

Marine Products

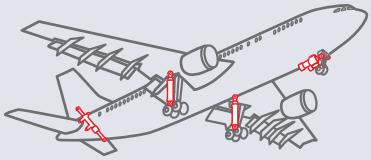


KYB hydraulic and tension control technologies make work at sea easier, including for ships operating remote devices for deep sea exploration, as well as for transport ships, supply ships and rescue ships.

Sports and Welfare

KYB uses its core technologies to develop products for sports and welfare.

Aircraft Components



KYB provides a wide range of aircraft components that meet the strict reliability requirements of the aerospace technology market, including components for flight control and landing, and for hydraulic and pneumatic systems.

KYB's Manufacturing

KYB's Technology Development

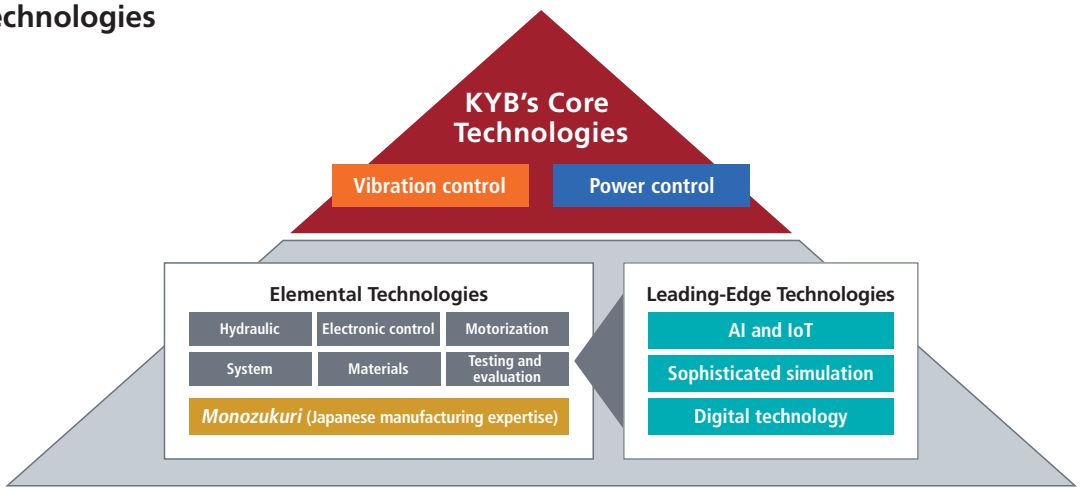
We incorporate cutting-edge technologies centered on hydraulic vibration control and power control to continue taking on the challenges facing the next generation.

The origin of KYB is the Kayaba Research Center, which was established by the inventor Shiro Kayaba in 1919. Since the founding of the center, we have spent a century refining hydraulic and other technologies. Our shock absorbers have earned a strong reputation among customers worldwide for their advanced technology and high quality, achieving market shares of about 40% in Japan and about 15% globally.

A major feature of hydraulic pressure is the ease with which it produces a larger output than electric, pneumatic or other driving methods. The ease of control due to its superior responsiveness is another reason for its wide use. For example, an automobile shock absorber that absorbs impact from the road surface is a good example of the use of the viscosity of oil to exert an appropriate damping force, and hydraulic pressure is considered the best system for construction machinery because of the large output required.

KYB has created a variety of hydraulic products in combination with other technologies such as electronic control, centering on the two core technologies of hydraulic vibration control and power control. Even with today's rapidly advancing technologies, we have confidence in the meaningful contribution that hydraulic technology can make to the development of society. In response to changing times, we therefore utilize cutting-edge technologies such as AI, IoT and advanced simulations to further evolve our core technologies, while promoting the electronic control and systemization of equipment to address changing social conditions and customer needs for environmental protection, safety and comfort. In doing so, we are taking on the challenge of developing the next generation of hydraulic equipment.

KYB's Technologies



Products That Utilize Our Original Technologies

Vane pump for CVT in light and compact automobiles

This vane pump for the hydraulic power source in the continuously variable transmission (CVT) that is used exclusively in light and compact vehicles achieves low cost and a smaller footprint while maintaining performance equal to existing products. Despite the conflict between cost reduction and miniaturization, we succeeded in achieving both by integrating production, technology and sales from the initial stages of development. As a result, KYB received a Global Special Award from JATCO Ltd. in July 2019.

Prosmooth™ (sliding parts for shock absorbers)

Prosmooth™ is a newly developed series of sliding parts for shock absorbers that deliver the next level of both luxurious "magic carpet ride" comfort with fine vibration control and line trace performance for cornering with a slight steering stroke. It has received a high evaluation from experts and has been adopted by a number of automobile manufacturers. In June 2018, Prosmooth™ received a Toyota Project Award in the Engineering Division from Toyota Motor Corporation.

Double hydraulic stop (DHS) suspension

DHS suspension shock absorbers generate high damping force throughout the full suspension travel. It features improved riding comfort during normal driving and high running performance on rough roads, and has been adopted in many models by numerous manufacturers. In June 2018, it received a Supplier Award from Groupe PSA.

KYB's Technology Development System

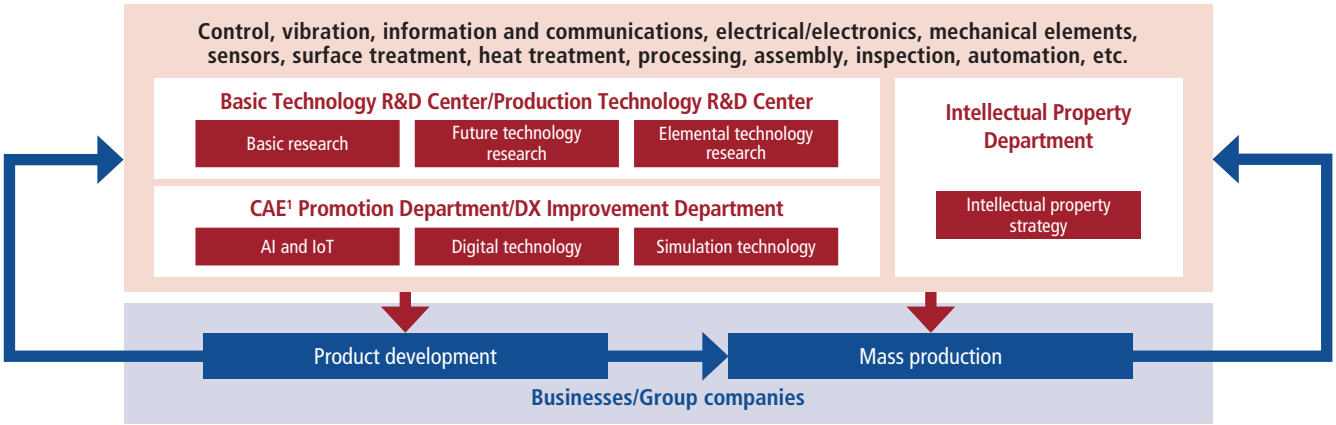
We aim to generate new value, with the Basic Technology R&D Center and the Production Technology R&D Center at the core.

KYB conducts research and development of its highly original and advanced technologies with the Basic Technology R&D Center and the Production Technology R&D Center at the core.

These R&D centers handle basic research and development of elemental technologies, while the technical departments of each business develop new products and make improvements to existing products in areas such as performance or cost reductions. In addition, the R&D centers and technical departments of each business and Group company work together to conduct projects across divisions. Moreover, for smooth, timely and efficient continuity from R&D to manufacturing, we consider future technologies based on long-term environmental changes and research, analysis and forecasting of the associated social and customer needs. We have established and implemented this approach as the roadmap for a sustainable growth strategy.

At the same time, we are reviewing our existing system for R&D and commercialization, and have started initiatives to respond to the new era. Engineers at our representative offices in Europe (Europe Technical Center) collect the most up-to-date information from around the world so we can identify technological trends and incorporate them in our R&D. In addition, we established a new Digital Transformation (DX) Improvement Department in 2019 to promote and cultivate digital technologies such as AI and IoT throughout the Company. By building an IoT platform, improving productivity and quality, conducting manufacturing using AI, developing products and rolling out new services, the KYB Group aims to provide products that customers can use with an even greater sense of reliability.

Technology Development Structure



The original R&D conducted at the Basic Technology R&D Center and the Production Technology R&D Center is carried out efficiently using the latest digital and simulation technologies under a multi-faceted intellectual property strategy. The businesses and Group companies conduct product development and mass production, fully utilizing the R&D done at the laboratories to deliver products to customers with appeal in every aspect of QCD[2] that other companies cannot match.

The process from R&D to product development and mass production does not proceed in only one direction. Through regular feedback, all employees share information and continue to update our products.

1. CAE: Computer Aided Engineering. The use of computer simulations to resolve issues faced by technical departments.
2. QCD: Quality, cost and delivery

Developmental Experiment Center

The Developmental Experiment Center is an extensive in-house facility on a scale rarely seen among independent manufacturers. The site is approximately 595,000 m^2 and includes a large-scale test track consisting of three types of road—straight, mountainous and circular—that reproduces different road surface conditions around the world. In addition to anticipating needs and taking the lead in conducting independent road tests of items including suspensions, steering devices and electronic devices for automobiles and motorcycles, we can also collect data on differences due to specification changes for evaluation jointly with customers. These and other capabilities have earned the Developmental Experiment Center a positive review as it enables us to fine-tune actual vehicles on-site. By expediting developmental experiments, we can shorten the development period and conduct development more efficiently.

Developmental Experiment Center
(Kamo-gun, Gifu Prefecture)

KYB's Production Technologies

We will leverage the manufacturing expertise we have honed over many years and integrate it with digital technologies to further raise its level.

KYB develops and mass produces items in a wide range of fields including automobiles, motorcycles, construction machinery, railroad equipment, special-purpose vehicles and aircraft components. Factors such as size, quantity, cost and quality control are different for each product field, requiring separate handling, and manufacturing must also be responsive to social changes in the global situation, the economy and other conditions. Under these circumstances, KYB has been responding to customer requests by developing production line, processing and assembly technologies tailored to each product field.

More specifically, we started manufacturing shock absorbers, which are a mainstay product, in an era of low variety, high volume production (to 1998), then transitioned to simplification of the production line through product standardization (2000-2005), the creation of a line optimized for production volume and product characteristics (2006-2011) and a compact line that handles changes in number of units produced and product types (2012 to present).

Going forward, we will promote innovative manufacturing utilizing digital technologies such as AI and IoT and integrate it into our existing manufacturing (processing/assembly) technologies to further raise the level of our technologies.

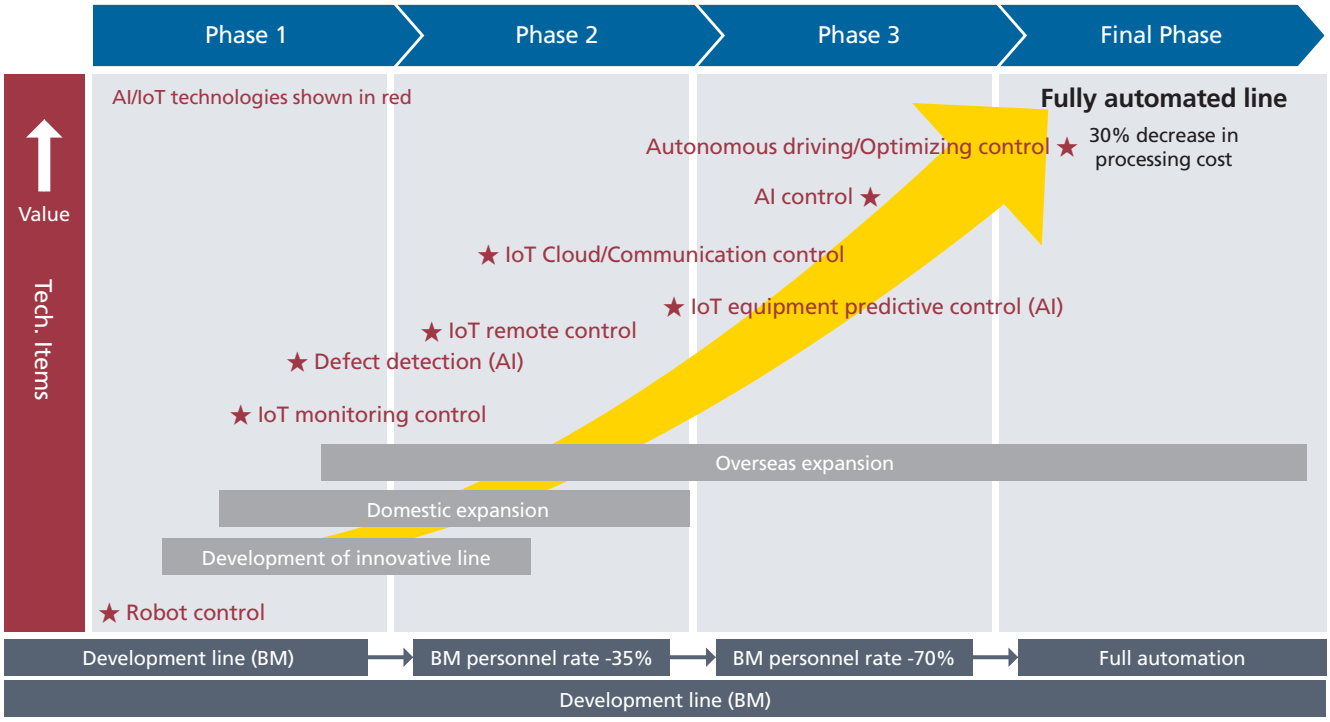
As one aspect of our innovative manufacturing, we aim to create the world's most advanced factory for producing shock absorbers. Based on the roadmap shown in the figure below, we will proceed steadily toward a fully automated production system in the future.

Gifu North Plant

Gifu East Plant

Sagami Plant

Innovative Manufacturing Roadmap



Outlook

We aim to help resolve social issues through greater competitiveness and innovative manufacturing.

As an independent company, KYB has been conducting its own R&D and improving its technical and product development capabilities through interactions with customers around the world. We have applied and developed core technologies to enter diverse fields including automobiles, construction machinery, industrial machinery, special-purpose vehicles, railroad equipment and aircraft components. In addition to the technologies we have accumulated and our many years of experience and expertise, we have continued to respond to difficult requests from our customers with a can-do attitude and a sense of pride. These factors have made KYB what it is today.

We have raised four issues to be addressed in the future: promotion of electrification/electronic control and system support; utilization of digital technology (AI/IoT) and big data processing; realization of innovative manufacturing; and further improvement of competitiveness.

We will also more explicitly address social issues. Amid calls for environmental protection and clamor over the labor shortage in Japan, we are aware of the major role KYB has to play. For example, we believe we can make a contribution in areas such as dealing with the environmental aspects of the REACH regulations,* pursuing higher efficiency through electronic control for energy conservation and safety, and working toward automatic operation of construction machinery.

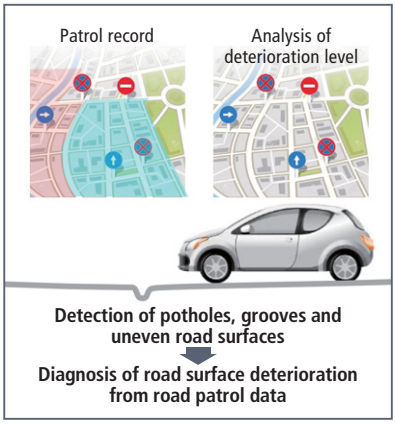
The KYB Group's global development network currently spans the five regions of Japan, the United States, Europe, China and ASEAN. However, to succeed in these volatile times, we are searching for more efficient development methods and reconsidering the appropriateness of our organizational structure. In addition, we will place a greater emphasis on cultivating engineers who can respond flexibly to changes as we continue working to create the hydraulic technologies of the future.

* Regulations that came into effect in the EU in June 2007 with regard to registration, evaluation, authorization and restrictions on chemicals

Main Presentations and Lectures at Academic Conferences in FY2019

The Future of Smart Road Monitoring	Second SmartCity Technology Forum
Case Study of Use of CAE for Prediction of Electric Power Steering Characteristics	NewtonWorks Corporation Nonlinear Analysis Forum 2019
Anisotropy Analysis of Pierced Hole Shapes on Thin Steel Pipes	The 2019 Japanese Spring Conference for the Technology of Plasticity
Development of a Single-Joint Detachable Modular Hydraulic Robot	The 37th Annual Conference of the Robotics Society of Japan
Design and Experimental Verification of a High Force Density Tubular Permanent Magnet Linear Motor for Aerospace Application	AEROTECH EUROPE

Smart Road Monitoring



Engineer Education Programs

At KYB, it is important that engineers are involved not only in theoretical work, but also in trial and error in actual situations and with actual products. That is why our engineer education is focused on developing human resources who can act independently in other technical fields. We have 50 unique engineer education programs taught by employees. To respond flexibly to diversifying social and customer needs, we are developing engineers with skills in a variety of fields beyond hydraulics, mechanics and vibration, such as electronics and language education. We are also involved in industry-academia collaboration with several universities in Japan and overseas, and engineers from research institutes and universities from around the world visit our Company and engage in engineer exchanges.

Main Fields of Engineering Education Programs		
	• Mathematics/Physics/ Quality assurance • Statistics • Material strength • Hydraulics	• Shared fields • Mechanics and vibration • Electronics • Production technology

Participation in the National Skills Competition

As part of its training for young skilled workers, KYB participates in the "Manual Turning" section of the National Skills Competition held by the Ministry of Health, Labour and Welfare and the Japan Vocational Ability Development Association. In 2019, KYB won its first award for "Fighting Spirit." We will continue to take advantage of this opportunity to develop skilled workers with processing skills, judgment, critical thinking and perseverance.

The 57th National Skills Competition