

Business Overview

【Business Segment】

1. Automotive-related business

The automotive-related business is a Piolax's core field earning about 90% of its sales. Piolax is a development-oriented automotive parts manufacturer and makes products applying technologies of "elasticity (spring)" of any kind of materials such as metal and plastic. With this strength, it has been providing products that satisfy various customer needs, and this has led to its development to date.

Lineup of automotive parts

Powertrain parts



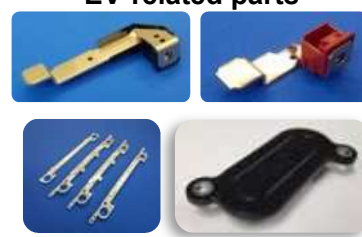
Retainer assemblies, snap rings, etc. used in the transmission and other powertrain mechanism.

Open & close mechanism parts



Air dampers, latches, etc. used in the opening and closing mechanism of the glove box.

EV-related parts



Battery and motor related parts such as bus bars and gas terminals

Clamps



Hose clamps to fasten pipes and rubber hoses to prevent their separation or leakage.

Harness parts



Band clips, taping clips, etc. to bundle wires and harnesses running in a vehicle like blood vessels and fix them to the vehicle body.

Fasteners

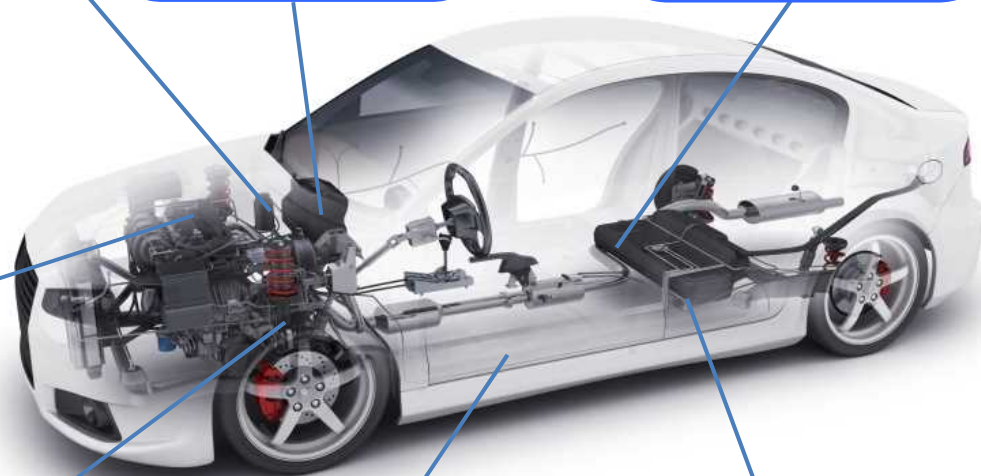


Metal and plastic fasteners like trim clips to fix interior and exterior parts and pipes to the vehicle body.

Fuel system parts



Valves, connectors, and filters to refuel, store and supply fuel safely and reliably.



Automotive parts

Piolax's automotive parts boast one of the industry's top market shares in Japan. They are broadly classified into fasteners, open and close mechanism parts, powertrain parts, and fuel system parts. For their details, please refer to our product information site LiNX.



<Fasteners>

Piolax manufactures a variety of plastic and metal fasteners to fix interior and exterior parts and piping to vehicle bodies.

For interior use, there are hidden fasteners that are invisible for good appearance, repeatedly used fasteners that are easy to remove and re-attach, and human-friendly fasteners with reduced VOCs (volatile organic compounds).

For exterior use, there are plastic fasteners that replace screws with excellent installation workability and high shearing and retention force, plastic nuts that can be assembled from one direction, and metal nuts that can be temporarily fixed to a mating part.



Trim clips



Garnish clips



Piping clips



Band clips

<Open and Close Mechanism Parts>



Latch



Damper



Spring cushion



Plastic hinge

Open and close mechanism parts are mainly used for storage boxes inside vehicles. They include latches for glove boxes and console boxes, and dampers that give a luxurious feel by softening the opening movement of storage boxes.

Spring cushions, which suppress rattling of storage box lids, function semi-permanently compared to conventional rubber parts and improve the closing feel. Lid hinges made of plastic contribute to weight saving.

<Powertrain Parts>

Powertrain parts are mainly used in transmissions. Our main products are composite springs (retainer assemblies) used in transmission clutches and snap rings for holding components.

In recent years, we are also focusing on resin-metal composite parts that can be used even in high-temperature oil to replace metal parts.



Retainer assemblies



Snap rings



Valve assembly



Baffle plate

As parts for EV reduction gears, we manufacture detent springs and torsion springs used in the parking mechanism, as well as shims used to adjust bearing clearance.



Detent spring

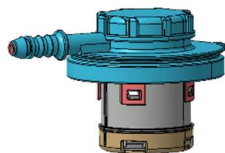


Torsion spring

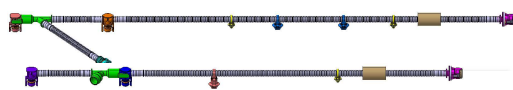
<Fuel System Parts>



CFLVV for PHEV



High seal 2K-ROV



Gas vent pipe



Connector-integrated filter

Our main parts relate to the flow path control of gasoline vapor (gas) and liquids around fuel tanks. They perform functions such as preventing gasoline from blowing back when refueling, detecting a full tank, and preventing leaks from the tank in the event of a rollover.

Recently, restrictions on the capacity and shape of gasoline tanks have been increasing due to the expansion of passenger space and the spread of HEVs. We are working to realize a spacious and comfortable cabin space by integrating valve functions and improving liquid level control technology.

Regarding parts for BEVs and HEVs, we are focusing on developing internal pressure control valves for gas generated from battery packs, joints and connectors for cold and hot piping, and connector-integrated filters for circulating oil.

<CASE products>

E-Products Development Department was established in April 2022 to take on the challenge of creating new value that does not belong to the four existing SBUs (Strategic Business Units). It positions "environment- and people-friendliness" as a core value to offer and conducts research and development of CASE products.

We are developing products that are indispensable for EVs, such as bus bars and gas vent valves ensuring battery safety for a certain period of time in the event of a battery failure. In the wake of electrification, noise control in the low-frequency band is drawing attention, and vibration-damping products are also under development to improve sound performance.

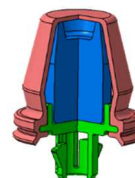
In addition, we are pursuing value in fasteners for sensors and cameras which are essential for driver assistance systems and autonomous driving to maximize their functions.



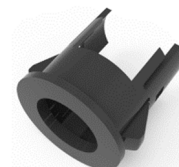
Bus bar



Gas vent valve



Vibration-damping part



Sonar bracket

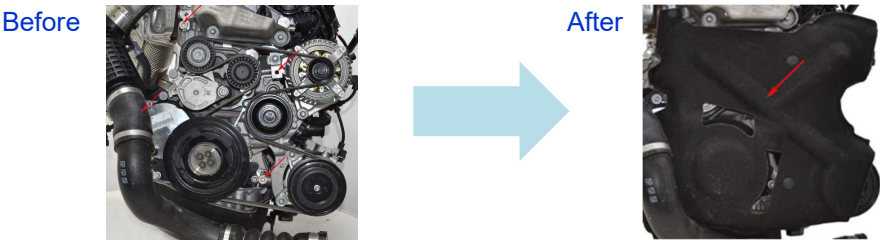
Eco-friendly products

Yokohama Technical Center plays a central role in developing products that contribute to the environment. Our criteria for eco-friendly products include "light weight, reduced number of components, integration, and selecting materials that are compatible with a recycling-oriented society."

Fastener: Insulator clip for new exterior noise regulations

Promoting recycling
Easy disassembly

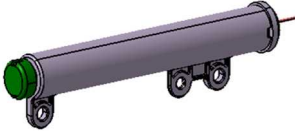
To encourage product recycling, we are reviewing materials in use to select easy-to-recycle ones. A loud noise is generated by the rotation of a belt and pulleys. Insulators to control the noise satisfying the new exterior noise regulations are irregular-shaped, and we have developed clips to attach such insulators to engines. They use recycling-promoting materials and are designed for easy disassembly. We will continue to promote a recycling-oriented society from the material level.



Open & close mechanism part: Improved string air damper (reduced number of components)

Light weight

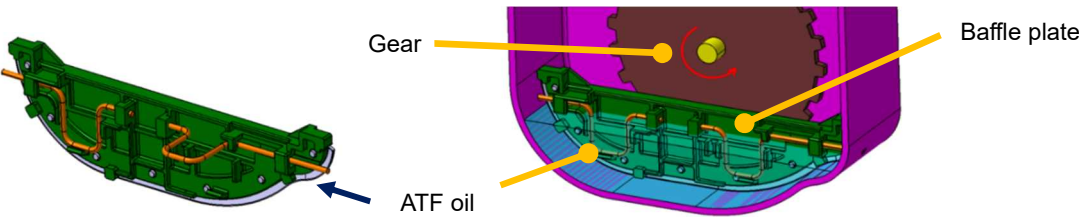
By devising the internal orifice structure (a hole through which air passes), the number of components has been reduced by two from the previous model without degrading function or performance. This product contributes to light weight and reduction in work processes.

	Current product	Developed product
Schematic		
Number of components	8	6

Powertrain part: Baffle plate for oil inflow prevention

Improved fuel efficiency
Light weight

This product reduces agitation resistance of gears rotating in the automatic transmission fluid (ATF) and contributes to improve fuel efficiency of automobiles. Based on our analysis technology, this is attached to the transmission case with wire, instead of bolts, and its behavior is stabilized by spring reaction force.

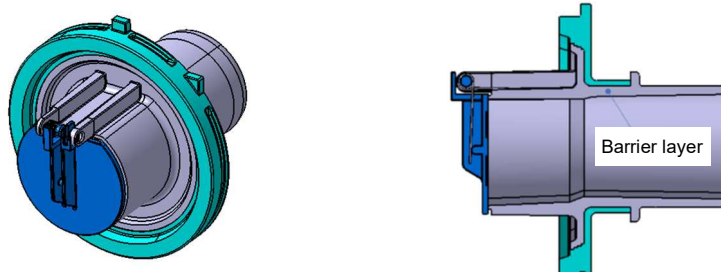


Fuel system part: 2K-ICV

Compliance with environmental regulations
Light weight

This valve is installed between the fuel tank and filler hose and prevents fuel from blowing back when refueling. By using a 2K (two-color molding) method to form a barrier layer made from a low-permeability material on the inner layer of the body, the amount of fuel evaporative gas released into the atmosphere is reduced, meeting strict exhaust gas regulations in countries such as North America and China.

The new model eliminates one component (BODY-B) from the previous one, contributing to weight saving.



CASE product: Damping stopper

Light weight

Our efforts to create new value pursuing weight saving are not limited to our product level. We are making such proposals to customers at the "vehicle level," too.

As a solution for muffled noise in the low-frequency band in vehicles, we are developing a "damping stopper" which uses a material with a damping function. If we succeed in replacing conventional dynamic dampers, the weight of each vehicle will be reduced by 0.3 kg to 1.8 kg.



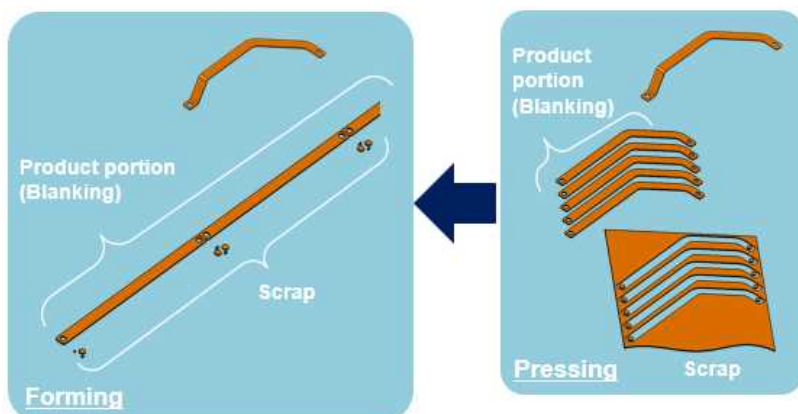
CASE product: Bus bar

Reducing material waste

Many electronic and electrical units are used in EVs and other mobility devices these days and bus bars are attracting attention as parts with conductive functions, because they are more flexible in layout and more efficient compared to conventional wiring harnesses.

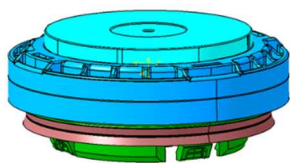
Most bus bars are punched out with a press from copper plates with excellent conductivity, but it generates a large amount of scrap. For the purpose of using up materials without generating waste, we have started to use a forming machine.

By bending plates in the direction of the plate width, which is impossible with a press, we have succeeded in reducing scrap produced from the base material by more than 30% to less than 5%.



CASE product: Gas vent valve for EV battery

Light weight
Simplified assembly work



In the rapidly expanding EV market, automakers are paying close attention to battery safety and researching safety devices.

To meet such needs, we have developed gas vent valves that fully utilize our technologies relating to "valves," "fastening," and "springs" cultivated over many years. This product can be fixed to the battery housing without using bolts, reduce weight, and simplify the assembly work.

Carbon neutral initiatives

As part of our efforts to reduce CO2 emissions, we are studying the use of biomass materials and recycling of resin materials.

You have ever seen food bags and detergent containers with silver aluminum on the inside and plastic on the outside. This packing material is used in large quantities and has become an issue in the industrial world, as its metal and plastic are stuck together and cannot be separated, making recycling difficult.

The Advanced Material Recycle and Innovation Alliance was established in 2022 as a joint industry-government-academia effort to find solutions to such difficult-to-recycle plastic materials and implement them in society. Piolax is participating in this project and considering the use of factory waste as packing materials for daily necessities (PIR*).

To realize a resource recycling society, we will continue our research in collaborating with other industries.



Packing material prototype that uses waste from packaging material manufacturing process

*PIR (Post-Industrial Recycling): Recycling or reusing materials generated in the manufacturing process of products before they are released on the market

<Research and Development Initiatives>

The Piolax Group's research and development is promoted by Design Department, e-Products Development Department, Production Engineering Department, Development Group of SBUs (including overseas subsidiaries), and a development division of our subsidiary Piolax Medical Devices, Inc.

Under the slogan "pioneer in creating elasticity," we engage in research and development of products utilizing elasticity, whether solid, liquid, or gas, and actively pursue the possibilities of "elasticity" in various fields, including the automotive industry, lifestyle-related items, and medical devices.

The Group's research and development expenses in FY2022 were 804 million yen (1.2% of consolidated sales). One of our goals set in the Medium-term Management Plan is strengthening research and development centered on CASE products, increasing the ratio to 1.5% in FY2025.

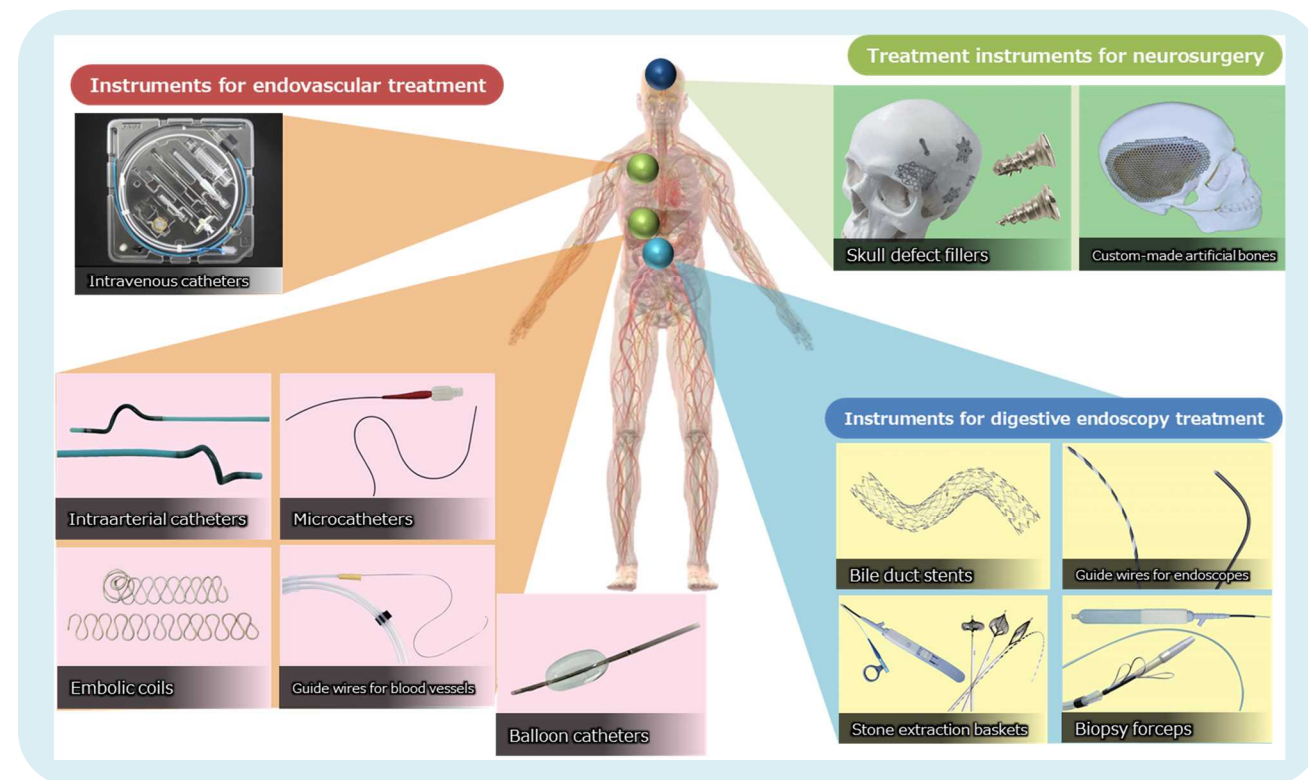
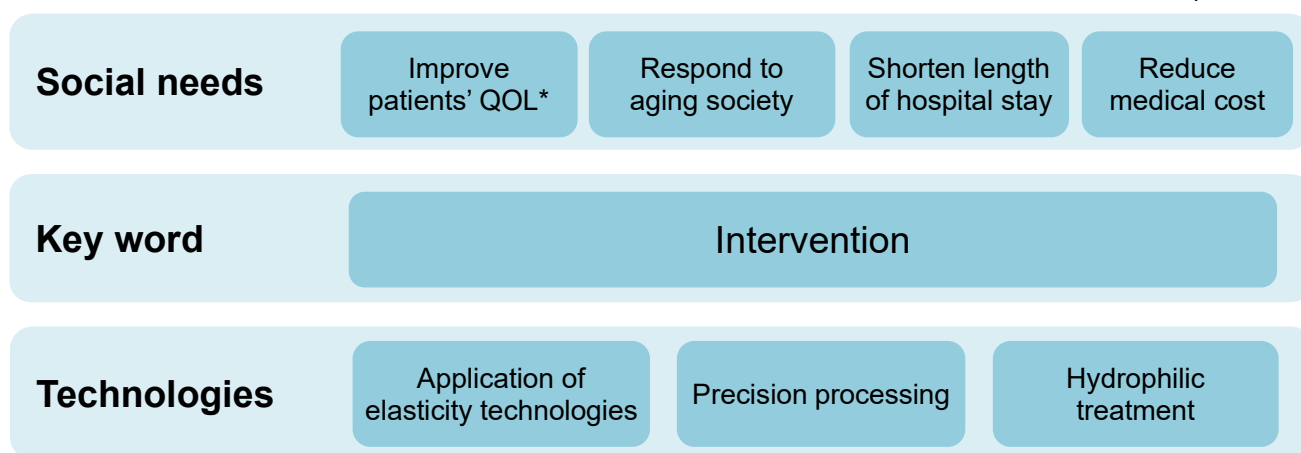
2. Medical device business

Piolax Medical Devices (PMD) operates a medical device business based on elasticity technologies Piolax has built through the development and manufacture of automotive parts as well as PMD's original technologies.

In scalpel-using surgical procedures, there are issues such as physical burden on patients, blood loss, and prolonged hospitalization. In the "interventional treatment" that PMD pursues, devices are delivered into the body or blood vessels through a small hole or incision of about 2 mm in diameter made in the skin or via an endoscope, without creating large surgical scars in their body. Through the interventional treatment, which is less physically demanding than surgical treatment, PMD realizes "people-friendly treatment" enabling patients' early return to society.

Applications that PMD aims for

*QOL: Quality of Life



<Recommended New Product>

Gastrointestinal endoscope guidewire "RevoWave DualMaster"

About one year has passed since the release of the gastrointestinal endoscope guidewire "RevoWave DualMaster."

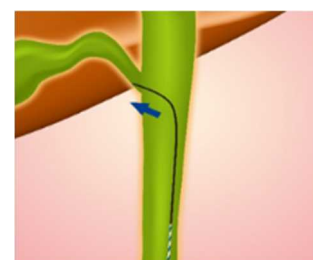
Since both of its ends can be used depending on the anatomy and pathology, this guidewire is considered cost-effective. Further, co-development and promotion with a doctor have a great impact in the market and we have received many inquiries from medical institutions.

Guidewires are made of thin and soft wire-like material (mainly shape memory alloy), guiding a medical device such as a catheter to a lesion. The key to successful treatment is whether doctors can manipulate such thin wires skillfully, and they study hard every day.

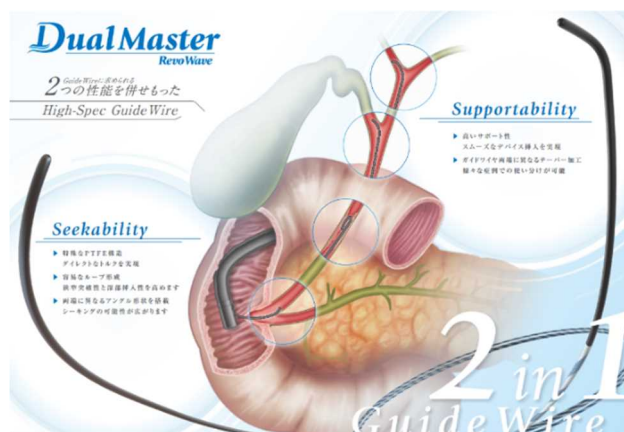
In the field of gastrointestinal endoscopy, new treatment methods using ultrasound endoscopes have recently emerged, and a wide range of performance is required for guidewires.

Under these circumstances, RevoWave DualMaster, which combines multiple performance, has smoothed out treatment that used to be difficult. With this single guidewire, doctors can complete a procedure regardless of their years of experience.

PMD has a vision to "provide patient-friendly medical devices that realize standardization of procedures and solve medical issues." RevoWave DualMaster is a product that can achieve this vision.



Comment from a doctor involved in the co-development (Dr. Hiroyuki Isayama, Professor of Gastroenterology, Juntendo University Graduate School of Medicine)



The RevoWave DualMaster, developed aiming for improving the quality of life of patients and based on the needs of doctors, is packed with Piolax Medical Devices' unique technologies.

During the development process, I spent quality time with PMD members through many discussions and reviews.

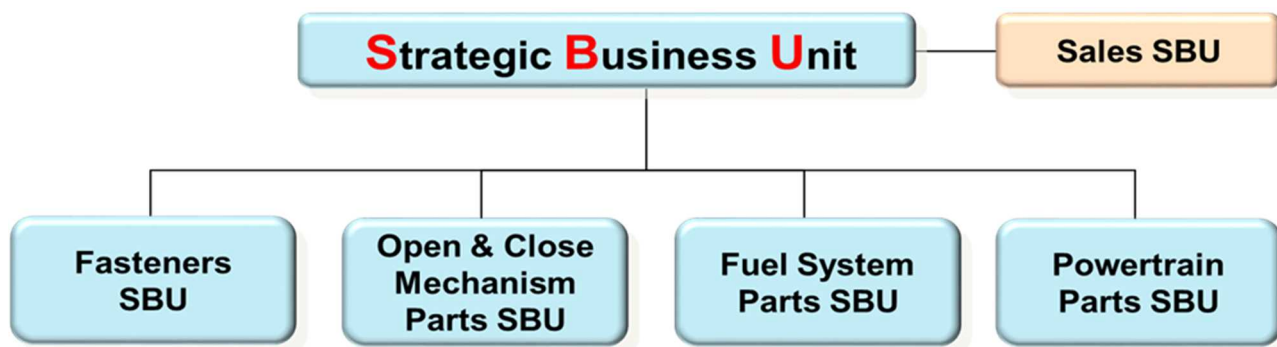
I am very happy that many doctors will pick up this guidewire and use it for their treatment.

【Organization】

1. SBU system

Automotive parts that Piolax produces include fasteners, open and close mechanism parts, fuel system parts, and powertrain parts, and we have introduced the SBU (Strategic Business Unit) system by product category. Each product-related SBU has marketing, development, and manufacturing sections and, in cooperation with Sales SBU, formulates and implements its own strategies. This enables Piolax to respond to market changes and customer needs quickly and flexibly.

Piolax SBU system



2. Design and development

As a development-proposal type company with high creativity and reliable technologies, the Piolax Group performs design and development activities in the U.S., the U.K., South Korea, China, Thailand and India as well as at Yokohama Technical Center (YTC) in Japan, where drawings are created based on proper understanding of customer needs.

YTC serves as a global center for design and development, where design, development, sales and purchasing divisions are located on the same floor. This enables seamless cooperation among them and promotes “synchronization” and “homogenization” of development capabilities in the whole Group.

Product testing facilities are located at YTC, Moka Plant, and Fuji Plant, securing optimal quality evaluation.

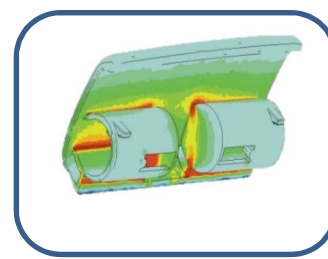
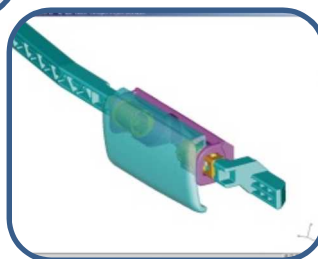


Survey of substances of concern

YTC keeps abreast of revisions to laws, regulations, and customer requirements related to substances of concern in relevant countries and creates a database of such information. Members in development and production engineering divisions use it to provide safe products to our customers.



Drawing review



Layout study and structure analysis by digital mock-up*

*Digital mock-up: A method using 3D data to verify designs and interference without creating actual prototypes



Environmental evaluation of products



Durability mounting test



SOC evaluation of materials

<Intellectual Property Initiatives>

Basic concept

The Piolax Group's approaches to intellectual properties (patents, utility models, designs, trademarks, copyrights, trade secrets, etc.) are to (1) respect intellectual property rights of third parties and avoid their infringement, (2) make rational use of our intellectual properties for our benefit, and (3) enhance the presence of our patents. We strive to create, protect, manage, and utilize our intellectual properties appropriately in coalition with relevant departments and group companies.

Intellectual property initiatives

Piolax promotes appropriate efforts by introducing an incentive system for employee inventions to encourage active creation of intellectual properties and by providing regular in-house training to deepen understanding about intellectual properties.

Concerning the development of CASE products, one of the key strategies in the Medium-term Management Plan, we are engaged in a patent strategy proposal activity. It aims to build a strong patent network by analyzing internal and external patent information on target CASE products from various perspectives and by defining the direction of development.

Number of rights held by the Group (as of March 31, 2023)

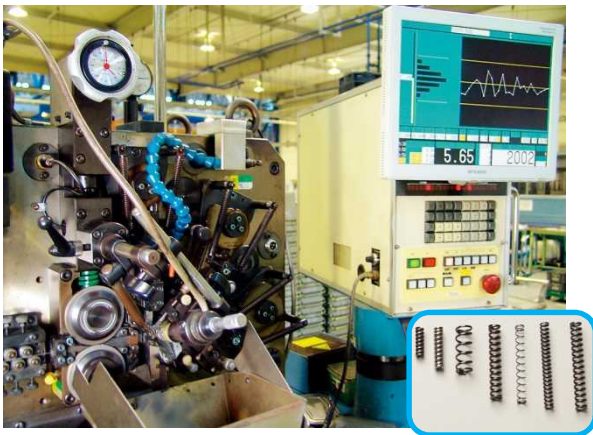
(Cases)

	Patents	Utility models	Designs	Trademarks
Japan	442	0	35	87
Overseas	340	2	30	74

3. Production engineering

Piolax strives to build manufacturing technologies suitable for a development proposal-oriented company and to ensure the same quality level in the Group. Its production lines for fasteners and open and close mechanism parts are located mainly in Moka Plant and those for fuel system parts and powertrain parts are in Fuji Plant. We will make continuous improvements to eliminate loss, raise global productivity, and develop new manufacturing methods.

Introduction of our processes



Winding of wire springs



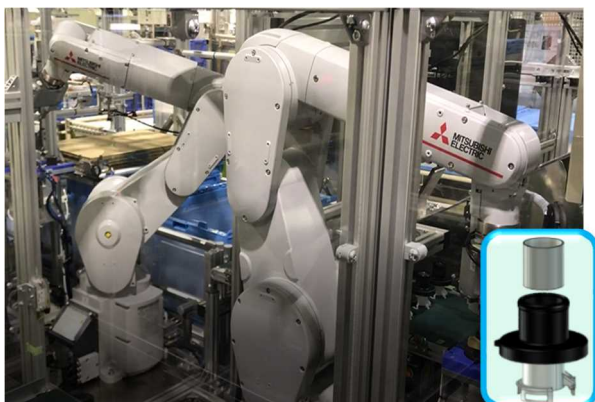
Pressing of flat springs



Injection molding



Cell production line



Labor saving: robot assembly line



Automation: flexible assembly line

【Product and Customer Strategies】

- Develop and increase sales of CASE products
- Diversify customers and products
- Maximize profit margin per product
- Globally achieve superior quality

More than 90% of the Group's sales are earned in the automotive industry. Our Group is highly dependent on Japanese automakers, and their production and sales trends tend to greatly affect our business performance.

In the automotive industry, efforts to achieve carbon neutrality are progressing rapidly. As the electrification of automobiles is accelerating, some of our products are expected to see a decline or disappearance of orders. To counteract this risk, we established e-Products Development Department in 2022 and are working to speed up the development of CASE products and increase their orders.

In addition, in order to diversify our customer base, we are strengthening sales to non-Japanese automakers to raise their sales percentage to 17% by FY2025. At the same time, we aim to maximize the profit margin of each product and promote technological development of high value-added products to increase parts sales per vehicle.

Quality is the foundation of these activities. We regard it as the most important issue for our Group and aim to achieve high quality throughout the Group. A new quality assurance organization has been launched since FY2022 to further enhance our quality management system.

【Business Strategy】

- Find a new business
- Reform profit structure

Due to new trends in the automotive industry, such as electrification, our Group may not be able to increase profits simply by expanding its automotive business.

For this reason, we established MIRAI Business Department in 2022 to create a third business following auto parts and medical devices with free ideas, without being bound by the existing businesses or manufacturing sector. Discovering a new business requires repeated trial and error. We will continue to take on challenges from a medium- to long-term perspective.

We have also started profit structure reform for future growth. Piolax's non-consolidated profit margin is declining since FY2016, and we are implementing activities to restore it. In order to build a profitable structure, we have set a goal of reducing fixed costs by 1 billion yen and securing a double-digit operating profit margin from FY2023 to FY2025.

Regarding investments for growth, we will actively encourage research and development for CASE and eco-friendly products, development of domestic infrastructure and human assets, digitalization, DX and IoT. We will carry out reforms based on two pillars: building a lean profit structure and investing for growth.

【Regional Strategy】

- Expand sales in North America and China
- Expand profitability of ASEAN bases
- Examine strategies in continental Europe
- Reinforce regional management functions

At our North American bases (U.S. and Mexico), we will expand production capacity and increase sales to non-Japanese automakers including the U.S. Big 3 (General Motors, Ford, and Stellantis), Volkswagen, and Hyundai.

At our Chinese bases, we will reduce our dependence on Japanese automakers and expand sales to Chinese automakers, as there are concerns about the continued stagnation of Japanese automakers in China amid the major movement toward electrification.

For the ASEAN and India regions, we will strengthen cooperation among our three bases in Thailand, Indonesia and India and enhance sales especially to rapidly developing Indian automakers, responding to the shift to EVs.

The ratio of sales to non-Japanese automakers in FY22 was 13%, and we aim to raise the ratio to 17% or more in FY2025. In Europe, a leader in automotive electrification and carbon neutrality, we aim to expand sales to European automakers, especially German automakers. As a stepping stone to our strategies in Continental Europe, we opened a representative office in Dusseldorf, Germany in FY2022. In FY2024, we plan to establish a sales company in the Netherlands and review our production system in Europe.

Plant expansion in India

In strengthening our approach to non-Japanese automakers, we have been able to win orders for EV battery-related parts. In preparation for the production shift to EV-related parts and future production increases, the 3rd plant is being built in the production base in Chennai, which will be completed in February 2024. This will increase production capacity by 1.5 times the current level. We will follow the expanding automobile industry in India.



Plants in India (Chennai)

Enhancing sales to Chinese automakers

In China, the automotive industry is entering a new phase, with the continued stagnation of Japanese automakers, our main customers, and the rapid shift to EVs. Against this backdrop, our Group has set a goal of reducing our dependence on Japanese automakers in China and increasing sales to Chinese automakers, which are strong in EVs, to 30% of our total sales by 2030. In addition to our existing products such as fasteners and open and close mechanism parts, we will focus on CASE products such as battery-related parts (for thermal management) and ADAS brackets (for cameras, radars, sonar, etc.).

【Growth Investment Strategy】

- Develop domestic infrastructure
- Strengthen R&D development
- Promote DX

Aiming for the growth of our Group over the medium to long term, we will actively invest in equipment, R&D, and DX. Regarding capital investment, in addition to strengthening domestic infrastructure such as building a new Moka Plant and a new Head Office, we will also expand overseas production bases in India and other countries.

Especially overseas, we will establish a production system that can handle new products including CASE products. We will also continue to invest in environmental measures at our production sites to achieve our carbon neutrality goal.

Official operation of new Moka Plant

We are constructing a new Moka Plant (Tochigi Prefecture) on a site adjacent to our existing plant since FY2022. Phase I construction will be completed and operation will start in FY2023. The new Moka Plant will become the "global mother plant," spreading Piolax brand to the world. The investment amount is expected to be 10.1 billion yen over the three years from FY2023 to FY2025. Phase II construction will begin in 2024 and is to be completed in FY2025. The total floor area at the end of Phase II will be 28,700 m² and accommodate the production of CASE products that is expected to expand in the future.



<Next-generation global mother plant>

- Next-generation equipment and molding lines
- Automated lines using AI/IoT technology
- Efficient production through DX
- 200% increase in productivity by 2030
- **Initiatives toward carbon neutrality**
- **Production of CASE products** (Increased production)

Expanding investment in CASE products development

The automobile industry is undergoing a period of major change once in a century, with technological innovation progressing in a new field called "CASE." For the purpose of responding quickly to this change and winning orders for CASE products, we established e-Products Development Department in April 2022. The department integrates the functions of sales, development, and production engineering to work on CASE.

Due to the electrification of automobiles, orders for some of our products will decrease or disappear in the future. We see this risk as a new business opportunity and have set a goal of "sales of 10 billion yen for CASE products by 2030."



Currently, e-Products Development Department is focusing on battery-related parts, sensor/camera-related parts for ADAS (Advanced Driving Assistant System), parts for e-Axel (a drive motor system that is said to accelerate the shift to EVs), and vibration control parts that meet the demand for quietness inside vehicles. We will aggressively invest in research and development to win these orders.

【Management Capital Strategy】

- Pursue capital efficiency
- Enhance shareholder returns
- Promote ESG management

Change in capital policy

In the Medium-term Management Plan (FY2023 to FY2025) announced in June 2023, we decided to extend a period of 100% dividend payout ratio for one year until FY2025.

We will strive to increase corporate value by improving ROE and capital profitability with an awareness of capital costs. Our capital policy is to limit the buildup of equity capital, maintain 100% dividend payout ratio, and purchase and retire treasury shares in a flexible manner.

	FY2022 to FY2024 Management indicators (previous)		FY2023 to FY2025 Management indicators (current)
ROE	8% or more (Final target: 10% or more, positive EVA spread)	➡	8% or more (continued) Final target: 10% or more, positive EVA spread
Consolidated dividend payout ratio	100%		100% (continued)

Promotion of ESG Management

In 2021, we established a sustainability policy and set up Sustainability Committee to strengthen our efforts to solve social issues and promote sustainable development of our company.

As a company involved in the automotive business, we recognize that the challenge of carbon neutrality is absolutely essential and that realizing a sustainable society is our responsibility. We have created and announced a roadmap for carbon neutrality in 2022, and our Group's efforts toward it center on three points: energy-saving activities, introduction of renewable energy, and use of innovative energy (methanation).

We have been installing solar panels at our overseas bases, and since FY2023, we have started purchasing 100% renewable energy at two plants in Japan (Moka and Fuji Plants). In addition, the new Moka Plant, which will be completed in FY2023, will install solar panels and other energy-saving equipment and promote initiatives to become a carbon-neutral model as the mother plant of the Piolax Group.

Regarding "S" (Society) of ESG, we have intensified our efforts to develop human assets. We have formulated a human assets development plan for executives, supported employees in drawing career plans, and introduced 360-degree evaluations. Also, based on the employee satisfaction survey launched in FY2022, we conduct activities to increase employee engagement and improve corporate value. To strengthen training for new employees and value learning in the field, we have resumed plant training that had been suspended due to the coronavirus pandemic, extending the training period from two weeks to six months.

Regarding "G (Governance)," in FY2022, we increased the number of outside directors as well as the number of female directors from one to two. In FY2023, we reviewed our executive compensation system and introduced performance-linked elements. We will continue to strive to strengthen governance with the aim of increasing corporate value over the medium to long term.

【Introduction of New Moka Plant】

Global mother plant transmitting the corporate brand

Since 1970, Moka Plant has been a mainstay of our production activities for many years. However, more than 50 years have passed since its establishment, and its aging and lack of production space due to increased sales led to a decision to build a new plant. We have purchased a site adjacent to the current plant, renovated the office building existing there, and will build two buildings; one is for production of plastic parts and the other for metal parts.



Shigeru Masuda
Director and Senior Executive Officer

The mission of the new plant is "Beyond our dream." It will be a state-of-the-art plant with the following functions: (1) supporting sustainable growth, (2) keeping up with changes, (3) encouraging new businesses and technology development, and (4) fostering manufacturing human assets.

One of the concepts of the new plant is a "plant with high productivity, flexibility, and reliability." Aiming for 200% productivity from the current level, the new plant will install integrated production lines and next-generation heat treatment and geomet lines and introduce DX using AI and IoT. It will also be a "non-stop plant" that can respond to changes in production conditions and recover quickly from disasters.

The other concept is an "eco-friendly plant." As a smart plant with high energy efficiency achieving CASBEE (Comprehensive Assessment System for Built Environment Efficiency) rank A, the new plant will install solar panels and other latest equipment that contribute to carbon neutrality and use the BEMS (Building and Energy Management System) for the centralized management and efficient operation of data in the buildings. In addition to these production functions, we will promote new initiatives, encouraging research and development of CASE products for electrification and ADAS and creating comfortable and lively workplaces where employees can work with confidence.

Phase I construction is until the completion of the plastic building in December 2023, and Phase II is until the completion of the metal building in October 2025. So far, the office building has been renovated, and the plastic building is almost finished as planned. We will make this new plant a global mother plant that embodies Piolax corporate brand and accelerates our growth.



Image of the new Moka Plant



Situations in November 2023