

Role in Sustainability - Product Innovation

Innovation management is used to establish a strong corporate brand image, create competitive advantages, align with the evolving market economy, and enhance the company's competitiveness, serving as a foundation for sustainable development.

- 3.1 Innovation Management
- 3.2 Product Quality
- 3.3 Customer Service and Management

Over **800**

Accumulated patents

9.33%

R&D expenditures as a percentage of revenue

Innovation Management

Intellectual Property and Trade Secret Management

Policies have been established for the application, maintenance, and management of intellectual property rights, including patents and trade secrets. Through a stringent confidential information protection system, the company ensures comprehensive protection of its intellectual property



↑ Exceeded ✓ Achieved — Missed Target Note: Due to adjustments in our patent portfolio strategy in line with the company's future development direction, the number of overseas patent extensions will no longer be included in the target count starting in 2024. As a result, the target number of patents has been reduced from 2024 onward.

Communication Channels: R&D Department ESG@viseratech.com

3.1 Innovation Management

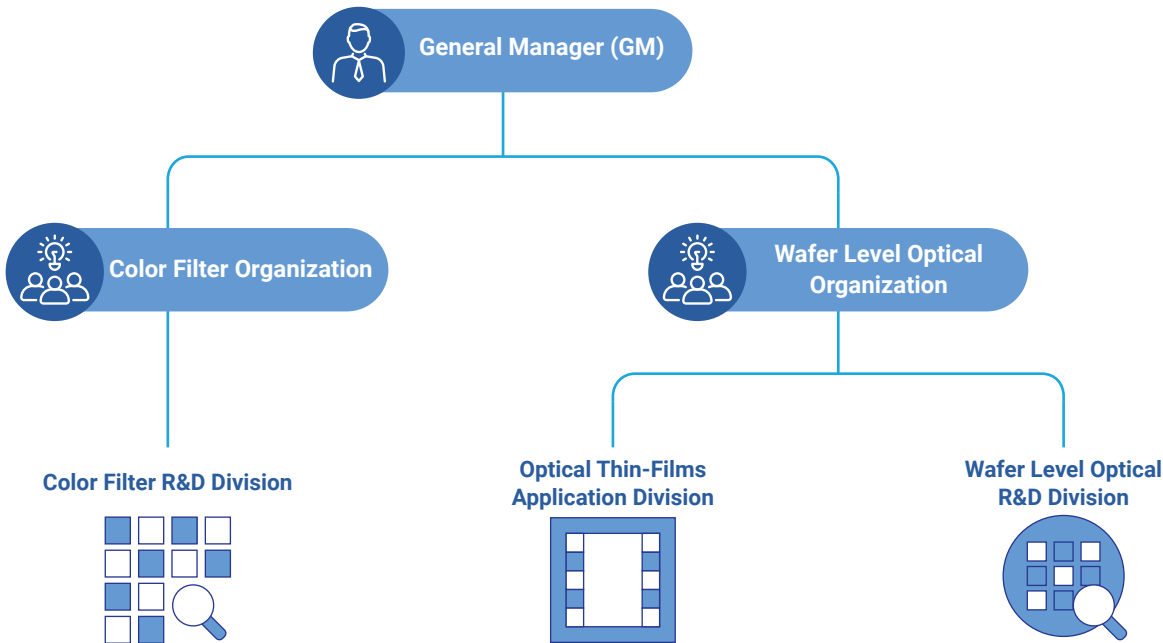
3.1.1 R&D Management

R&D Management Strategy

In order to comprehensively enhance the strategic development and energy of innovation management, VisEra’s ESG Committee established a Value Innovation Team. In addition to continuously investing in advanced processes and innovative equipment to maintain technological leadership while also considering green energy improvement, we will strengthen cross-border cooperation between industry and academia and actively cultivate an innovative culture to create a work environment conducive to innovation. This will effectively enhance the competitiveness of the enterprise. Furthermore, the Company has put in place mechanisms to encourage employees to actively practice diverse forms of innovation in their daily work, thereby continuously strengthening the organization’s overall innovation capacity.

Research and Development Management Framework

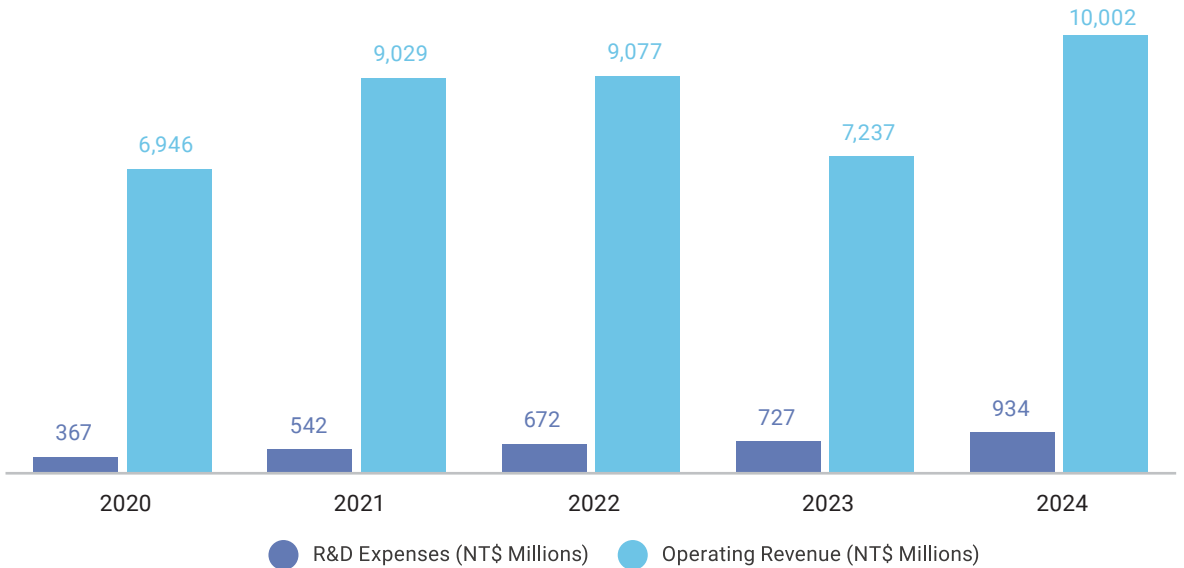
VisEra Company boasts a professional management and R&D team with extensive experience in product strategy and positioning. We continuously monitor industry information and trends in raw material prices, maintaining close communication with customers to stay abreast of industry dynamics. This enables us to continuously develop new technologies and products. The management and R&D departments regularly convene meetings to ensure that the R&D direction is aligned with the Company’s business development strategy, while continuously enhancing R&D capabilities, thereby strengthening our company’s competitiveness.



Investment in Innovative Research and Development

VisEra is committed to technological innovation and research and development of proprietary technologies. In 2024, it invested approximately 930 million New Taiwan Dollars in R&D, accounting for 9.33% of its revenue. Over the past three years, it has steadily increased its R&D expenditure annually to develop key technologies and consolidate its leading position.

Annual product innovation achievements and applications, please refer to [VisEra’s official website, Dedicated Optical Foundry/Main Product/Application](#).




Year	2020	2021	2022	2023	2024
Investment in innovative research and development					
R&D Expenses (NT\$ Millions)	367	542	672	727	934
Operating Revenue (NT\$ Millions)	6,946	9,029	9,077	7,237	10,002

Product's Contribution to Society

01


Image Sensors

Micro lenses can enhance imaging sensitivity by about **20%**, reduce power consumption, and increase sensitivity of color filter array to improve nighttime visibility




Smartphones

- 1 High-resolution and small pixel technologies provide increasingly higher image resolution to meet human visual perception.
- 2 Image recognition allows humans to have a deeper understanding of the surrounding environment more easily (e.g., search, shopping, and translation).




Self-driving Cars

Protect pedestrians and drivers for driving safety.




Internet of Things (IoT) Devices

- 1 Smart recognition provides timely alerts and offers 24-hour peace of mind home monitoring technology.
- 2 AI intelligent image analysis system provides road traffic safety monitoring and faster assistance in criminal cases and vehicle tracking.



Smart Wearable Devices

Used to capture images of the surrounding scenes in life, combined with AR personal or commercial applications to overlay virtual messages on life scenes, such as navigation, to improve convenience.




Technological Medicine

Eye gaze tracking technology brings convenience to people with disabilities and major illnesses in their daily lives.

02


Light Sensors

~**10%** saving of electricity




Smartphones

- 1 Adjust screen backlight brightness to improve eye comfort under different lighting conditions.
- 2 Automatically turn off the screen to extend the battery life of smartphones and save energy.




Self-driving Cars

Provide more comfortable and convenient automation settings for drivers (e.g., automatically turn on dashboard screens and headlights in low light conditions, rain detection and automatic wipers, activation of car safety airbags, and interior temperature regulation).




Internet of Things (IoT) Devices

- 1 Smart applications enhance people's control over pollution.
- 2 Sustainable housing low-carbon innovation solutions (smart energy regulation).



Smart Wearable Devices

Adjust the brightness and color temperature of AR/VR screen displays according to the living environment, helping to maintain eye safety and regulate the comfort of screen displays.




Technological Medicine

Light sensors on wearable devices use LED lights to illuminate blood vessels and measure changes in blood characteristics such as heart rate (heart rate sensor) or the absorption spectrum of hemoglobin and oxyhemoglobin in blood to infrared and red light (blood oxygen sensor) to detect changes in body characteristics, providing advance reminders and prevention.

03

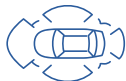
3D Sensors

Optical coatings improve signal-to-noise ratio, increase by **3db**, reduce laser intensity by **50%**, increase accuracy and anti-interference capability of identification




Smartphones

3D facial recognition and optical fingerprint recognition protect user privacy (encryption, unlocking) and provide authentication basis for mobile payment.




Self-driving Cars

Establishing 3D images with LiDAR to upgrade the surrounding perception of self-driving cars.



Internet of Things (IoT) Devices

- 1 Emerging contactless applications for epidemic prevention (gesture, distance detection).
- 2 3D sensors combined with AI analysis for real-time movement matching in fitness systems, monitoring and tracking physiological health data in daily life, and providing proactive health recommendations.



Smart Wearable Devices

- 1 Motion sensing devices, gesture control.
- 2 3D environmental modeling to enhance convenience in daily life.

04

Optical Fingerprint Recognition Device

Microscopic lenses increase light input by **2-3 times**, while colored filters enhance anti-counterfeiting properties



Smartphones

3D facial recognition and optical fingerprint recognition protect user privacy (encryption, unlocking) and provide authentication basis for mobile payment.



Self-driving Cars

Fingerprint unlocking adds driver identity verification and personalized operation interface settings.



Internet of Things (IoT) Devices

Miniaturized sub-screen optical fingerprint devices, providing longer standby time and safeguarding user privacy (encryption, unlocking) and mobile payments without affecting the layout of smartwatch batteries and the use of miniaturized screen devices.

05

Silicon Photonics Technology

with over **50%** volume reduction
and more than **30%** power consumption reduction



AI Photonic Computing

By leveraging silicon photonics platform technology, the electrical signals in data center servers or switches can be converted to optical signals for transmission. When combined with Co-Packaged Optics (CPO) technology for optoelectronic integration, power consumption can be reduced by 50% compared to pure electrical transmission, while also reducing signal latency by 50%.



Self-driving Cars

By employing optical semiconductor process technology on silicon wafers, traditional mechanical LiDAR functions are integrated into a fingertip-sized chip, accomplishing both device miniaturization and power consumption reduction.

06

Miniaturized Display Device

Improvements in the efficiency and brightness of miniaturized OLED/LED displays can provide up to **~50%** increase in battery life



Smart Wearable Devices

Dedicated to developing lightweight, compact, high-color brightness screen displays, addressing user dizziness and providing an excellent wearing experience.



Technological Medicine

Miniaturized displays enable digital messaging and near-eye applications. In medical-grade applications, they aid visually impaired patients in reproducing partial vision on the retina.

07

Bio-Medical Chips

Miniaturization reduces chip costs by **30%**, offering a chance for **15%** of global cancer patients to receive early detection and effective treatment



Technological Medicine

- 1 Utilizing VisEra optical bio-detection technology, biological fluorescence in reaction wells is focused through filtering elements and decoded via sensing chips, providing test chips for prenatal chromosome examination, cancer predisposition analysis, or rapid screening for infectious diseases.
- 2 Miniaturized optical bio-detection technology enables precise healthcare, paving the way for personalized medicine and portable diagnostic devices.
- 3 It enhances diagnostic efficiency for medical personnel and reduces user waiting time.



3.1.2 Management of Intellectual Property Rights and Trade Secret

VisEra has been dedicating itself to technology innovation, in order to maintain its hard to reach R&D results of advanced technology and to improve competitiveness, through encouraging R&D innovation and other incentive system, together with patent portfolio planning which is in line with our business objectives, we have created a virtuous R&D innovation circle and corporate culture which serves as a firm basis for our sustainable management.

VisEra actively promotes intellectual property right (IPR) management plans, has established regulations governing the application, maintenance, and management of IPR that relates to patents and trade secrets, and prevents the leakage of R&D achievements and critical technologies through a stringent confidential information protection system, so as to comprehensively protect the Company's intellectual properties.

The Company implements strict confidentiality protection in accordance with the Proprietary Information Protection (PIP) Policy for the R&D results in all stages. We established detailed regulations on the use of related information. We also restrict the entry and exit of computer and other devices to prevent unauthorized disclosure or infringement of intellectual property. If the development of a technology meets the requirements for patent application, it will be submitted to the Invention Review Committee for a technical review. If approved, a patent application will be filed immediately.

For the protection of patents, VisEra established the Patent Management Regulations to serve as an incentive system to encourage R&D personnel to actively apply for patents for their R&D results. We consider R&D results which are not suitable for patent applications as trade secrets. We maintain confidentiality and protection measures in accordance with the aforementioned PIP Policy, and we established a trade secret management system which also provides an incentive system to encourage R&D personnel to present such R&D results to the Invention Review Committee. After results are reviewed and approved by the the Committee, we award the R&D personnel with incentives based on the level of technology. We also implement a unified storage mechanism and assign dedicated personnel to manage in order to prevent unauthorized disclosure or infringement of such information. In 2024, over one hundred personnel has recived incentives related to technology development. Besides, in 2024 VisEra has awarded a "Best Technology Invention of the Year" prize to the most outstanding R&D personnel to set a good example and encourage others to work hard at pursuit of excellence.

VisEra has set patent strategies in countries including the United States, Taiwan, Mainland China, and Japan. Since the organization of the Company, we have obtained more than 800 patents and the number continues to increase. At the end of each year, the management team sets appropriate KPIs for intellectual property for the following year based on the R&D status in the R&D units of each organization, future business strategies, and patent strategies for each country. The indicators are used to encourage R&D within the Company. At least once a year, the head of R&D or the head of legal affairs also reports on the current R&D progress and future R&D plans at the board meeting for the Directors to learn about the Company's plans for intellectual property rights. The report on the Company's intellectual property management plan was provided at the board meeting in the second quarter of 2024. Please refer to the following timeline for relative history.



3.1.3 Industry-Academia Research Collaboration

While pursuing technological leadership, we also uphold our corporate social responsibility. We collaborate with National Cheng Kung University, National Yang Ming Chiao Tung University, National Central University, National Tsing Hua University, and National Taiwan University. Through long-term and diverse industry-academia partnerships, we not only leverage the research and development capabilities of academic institutions but also contribute to nurturing outstanding talent for the industry.

School name	Collaboration project	Application
National Central University (NCU)	Wafer-Level Multilayer Film Coating Design	3D sensing, wearable device sensors, and AR/VR.
National Yang Ming Chiao Tung University (NYCU)	Micro-Optical Component Design	3D sensing, wearable device sensors, and AR/VR.
National Tsing Hua University (NTHU)	Meta-surface design	3D sensing, wearable device sensors, and AR/VR.
National Cheng Kung University (NCKU)	Development of Optical Characterization Techniques for Novel Semiconductor Materials	We actively cultivate diverse and outstanding talent to engage in semiconductor engineering research and development, providing applications for smart 3C products, the Internet of Things (IoT), autonomous vehicles, and more. At the same time, we also foster advanced professional research through these efforts.
National Central University (NCU)	Design of Metasurface Lenses	Enhance the optical efficiency of CIS color filters or directly replace color filters and microlenses.
National Central University (NCU)	Optical Parameter Measurement System for Lens Modules	Wearable device sensors, machine vision, and 3D sensing.
National Central University (NCU)	Design of Metasurface Lenses	Wearable device sensors, machine vision, and 3D sensing.
National Taiwan University (NTU)	Wafer-Level Multilayer Film Coating Design	3D sensing, wearable device sensors, and AR/VR.



3.2 Product Quality

VisEra has established, implemented and maintained a quality management system in accordance with the requirements of IATF 16949, ISO 9001 and ISO 13485 quality standards, and ensures and improves product quality by continuously improving the effectiveness of the quality management system. Compliance with this quality management system will prove that the company can stably provide products that meet customer and applicable legal and regulatory requirements. At the same time, customer satisfaction can be achieved through the effective application of the quality management system, including continuous improvement and prevention of non-conformities.

3.2.1 Product Quality

Helping customers with product development and mass production is one of VisEra's top priorities. VisEra's customer service team is committed to providing world-class services to customers, including product design consultation, project development assistance, and professional technical support. We establish good communication channels with customers and provide the highest level of protection for their confidential information. We are committed to serve as the most reliable partner for our customers.

VisEra invests in continuous quality improvement in every part of the Company to ensure complete customer satisfaction. If any defect or inconvenience is found, we communicate with customers immediately and implement all necessary measures to isolate the event. We uphold the following quality policy and invite all employees to cooperate with each other to achieve our goal of zero defects:

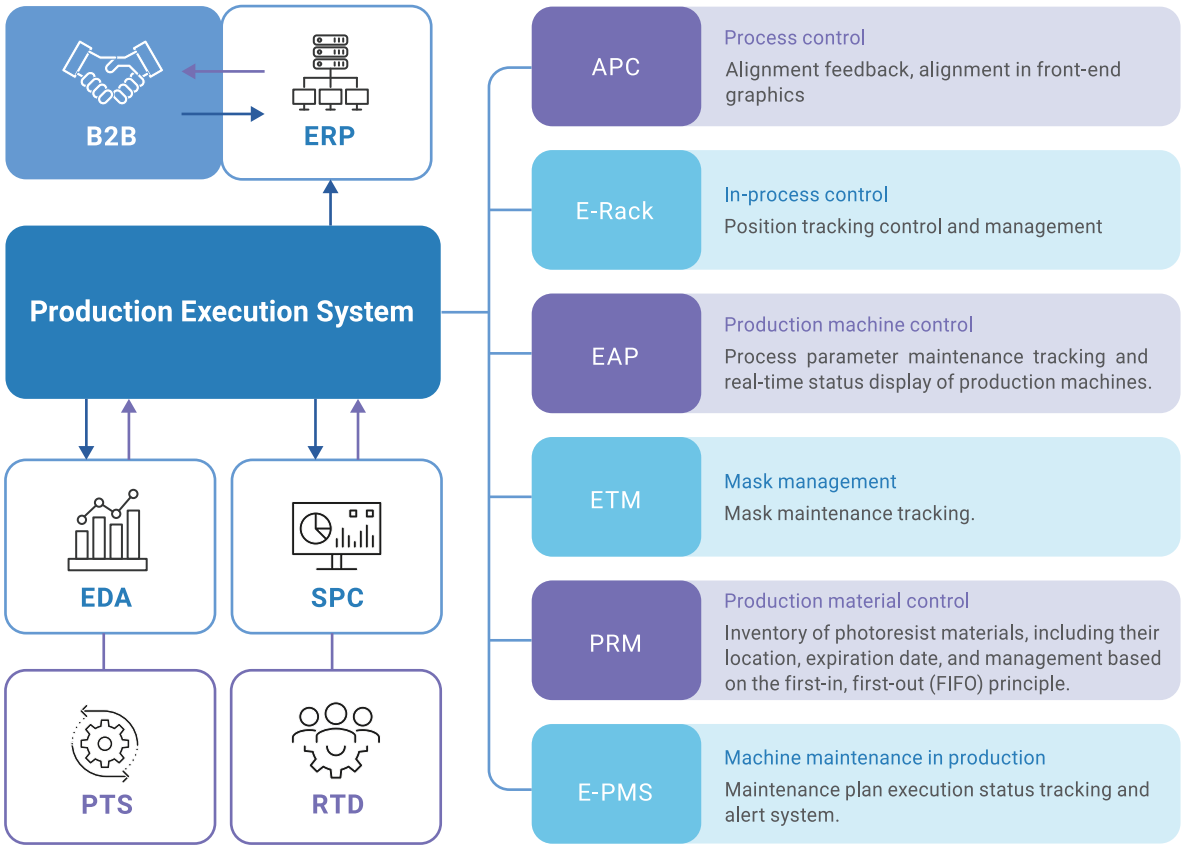
Service
Adopt a customer-centric approach to ensure complete customer satisfaction.

Quality
Implement continuous improvements to provide customers with satisfying products.

Cost
Improve efficiency and productivity and reduce production costs.

Delivery
Implement timely production planning to meet customer needs.

Since the establishment of our Hsinchu plant in 2006, we have been committed to the establishment and implementation of ISO 9001 and IATF 16949 (formerly TS 16949) automotive quality management systems, and launched the Enterprise Resource Planning (ERP) system to integrate resource management for processes, batch control, equipment, masks, raw materials, and project control. In addition, we implemented advance preparation by obtaining the ISO13485 certification for the medical supply chain in 2019. The Company pursues continuous quality improvements to enhance competitiveness and achieve quality improvements across the board. With the expansion of business and to provide customers with more complete services, our company launched the production bases of Zhongli Plant and Longtan Plant in 2017 and 2022. Each plant also successfully completed the establishment of the ISO 9001 system in the same year and has continued to maintain it to date.



To strengthen VisEra's quality culture, the Quality Assurance Department organizes general quality courses for all employees each year and promote the use of the Eight Disciplines Problem Solving as the basic framework for the problem-solving steps of the Company. Our aim is to increase employees' awareness of quality and their use of quality assurance tools. We hope that the use of quality tools can help employees find opportunities for improvement in their work and propose valuable and effective response measures. We offered 60 digital courses and reading courses for quality management in 2024 for 2,484 attendees who passed the courses with 1,117 total training hours. In addition, VisEra encourages all employees to actively participate in continual improvement programs. We organize the Continual Improvement Team Conference (CIT Conference) each year to provide a platform and rewards for exchanging ideas. We hope to create a corporate culture of high quality and continual improvement based on the spirit and activities for continual improvement.

Results of VisEra's CIT activities in the last five years

VisEra's Continual Improvement Activities (CIT)	2020	2021	2022	2023	2024
CIT competitions (number of cases)	7	9	9	10	8
Total number of participants	97	112	108	110	95



3.2.2 Green Design of Products

Product Green Design aims to minimize the environmental impact throughout the product design process while ensuring the product’s quality and functional performance. Its core concept is based on environmental protection, achieved by selecting green materials, reducing energy consumption, minimizing pollution emissions, and designing for recyclability and sustainability.

At VisEra, the approach to Green Design (Design for Environment) adopts a comprehensive Life Cycle Thinking (LCT) perspective. This encompasses all stages from raw material procurement, manufacturing processes, product transportation, product usage, to waste disposal. The design, process management, and continuous improvement efforts focus on seven key aspects: energy efficiency, greenhouse gas emissions, material reduction, conflict minerals, hazardous substances, waste reduction, and water resource conservation. The company has been dedicated to developing advanced, efficient, and environmentally friendly products. This includes ongoing collaboration with customers to design low-consumption, high-performance products and exerting influence over suppliers for conflict minerals management and hazardous substance control. In efforts to continuously enhance environmental friendliness, VisEra has established environmental safety and health performance indicators and actively promotes projects aimed at reducing waste, recycling resources, and lowering greenhouse gas emissions. Through green design, the company expects to reduce production costs, improve product quality, and strengthen brand image, thereby meeting the environmental protection needs and expectations of customers and consumers and achieving sustainable development goals.

VisEra Company Green Design Matrix	Material Procurement	Production and Manufacturing	Product Transportation	Product Usage	Resource Recycling
Energy Efficiency	●	●	●	●	
Greenhouse Gases	●	●	●	●	
Material Reduction	●	●	●		
Conflict Minerals	●				
Hazardous Substances	●	●			●
Waste Reduction		●			●
Water Resource Conservation		●			

3.2.3 Hazardous Substance Management

VisEra’s management of hazardous substances is built upon the QC080000 hazardous substance management system. For substances that may affect human health or pollute the environment, the company adheres to the principle of avoiding use whenever possible and minimizing use when unavoidable. Products manufactured for customers fully comply with international regulations and customer requirements regarding hazardous substances. Additionally, VisEra continuously promotes hazardous substance substitution programs for raw materials in the manufacturing process. We require suppliers of raw materials to provide declarations ensuring their products do not contain internationally banned substances harmful to the environment. This guarantees compliance with customer demands and international regulations such as the EU RoHS and REACH directives, achieving 100% conformity with hazardous substance reduction regulations and customer requirements. Specifically, we do not use perfluorooctanoic acid (PFOA) and related substances, nor N-Methyl-2-pyrrolidone (NMP). In 2020, we completed the evaluation and introduction of substitutes for PFOA and NMP, and by 2021, no PFOA or NMP was used. Since 2022, we have continued evaluating and implementing alternatives for perfluorohexanoic acid (PFHxA). By 2024, 27 photoresists have been introduced with a substitution rate of 64%, and we expect to complete 100% PFHxA substitution (covering 42 photoresists) by 2025 as scheduled.

The use and management of chemicals are closely related to environmental protection and sustainable development and have long been a key focus of various international sustainability indicators. VisEra is committed to environmental sustainability and, adhering to the principle of sustainable operation, continuously optimizes production processes to reduce the unit consumption of chemicals. By the end of 2024, the company has completed a photoresist reduction plan, achieving an average reduction of approximately 40% in chemical usage.

Product hazardous substance management procedures

Hazardous substance management system / Quarterly management review / No non-conformities



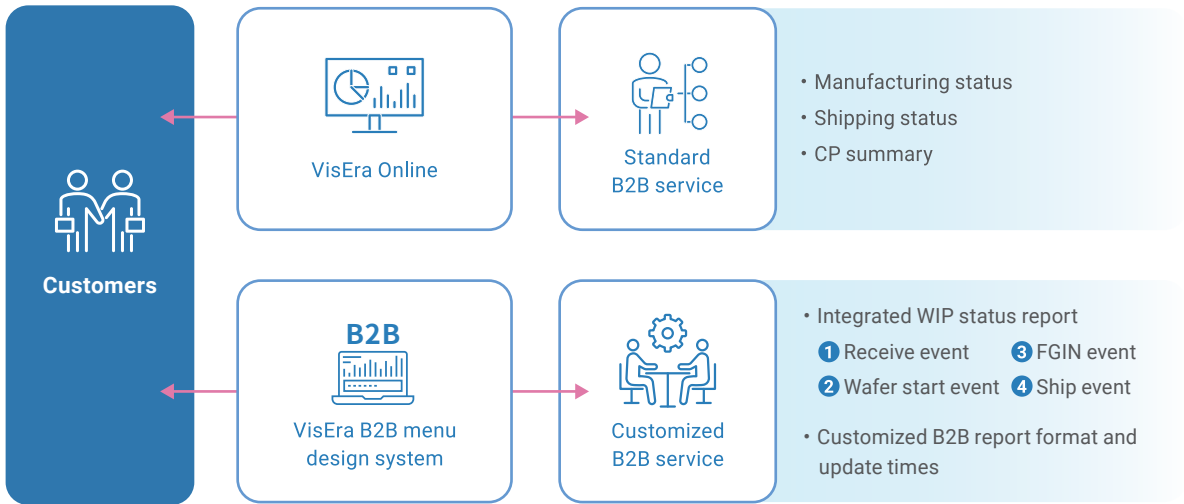
Meet or exceed product hazardous substance management requirements in international regulations

International regulations / customer requirements	Summary of requirements and restrictions	Regulatory compliance description
EU RoHS Directive (EU RoHS)	Product content restrictions include lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyls (PBBs), polybrominated diphenyl ethers (PBDEs), diethylhexyl phthalate, diisooctyl phthalate (DEHP), benzyl butyl phthalate (BBP), dibutyl phthalate (DBP), and diisobutyl phthalate (DIBP). Please refer to the EU website for relevant regulations.	VisEra provides lead-free packaging processes for customers. However, certain customers still require the use of minute amounts of lead in bumps due to product characteristics. They are currently part of the EU RoHS exemptions and other substances banned in the EU RoHS are not used in VisEra’s manufacturing process.
Product halogen-free requirements.	Bromine: 900ppm Chlorine: 900ppm Bromine + Chlorine: 1,500ppm	All VisEra products meet requirements.
Control the use of perfluorooctane sulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) on the manufacturing process.	PFOS : 1,000ppm PFOA : 1,000ppm	VisEra has completely banned the use of materials that contain PFOS and PFOA and no product contains the two substances.
EU REACH Annex XVII - List of Prohibited and Restricted Substances.	Please refer to the EU website for relevant substance control regulations.	All VisEra products meet requirements.
EU REACH Substances of Very High Concern (EU REACH SVHC).	Please refer to the EU website for relevant substance control regulations.	All VisEra products meet requirements.
Waste Electrical and Electronic Equipment Directive (WEEE).	Please refer to the EU website for regulations on the waste recycling rate of electronic and electrical equipment and products (e.g., computers and mobile phones).	The products manufactured by VisEra are wafer semiconductors, which form parts of electronic and electrical equipment components and are not directly governed by this regulation.

3.3 Customer Service and Management

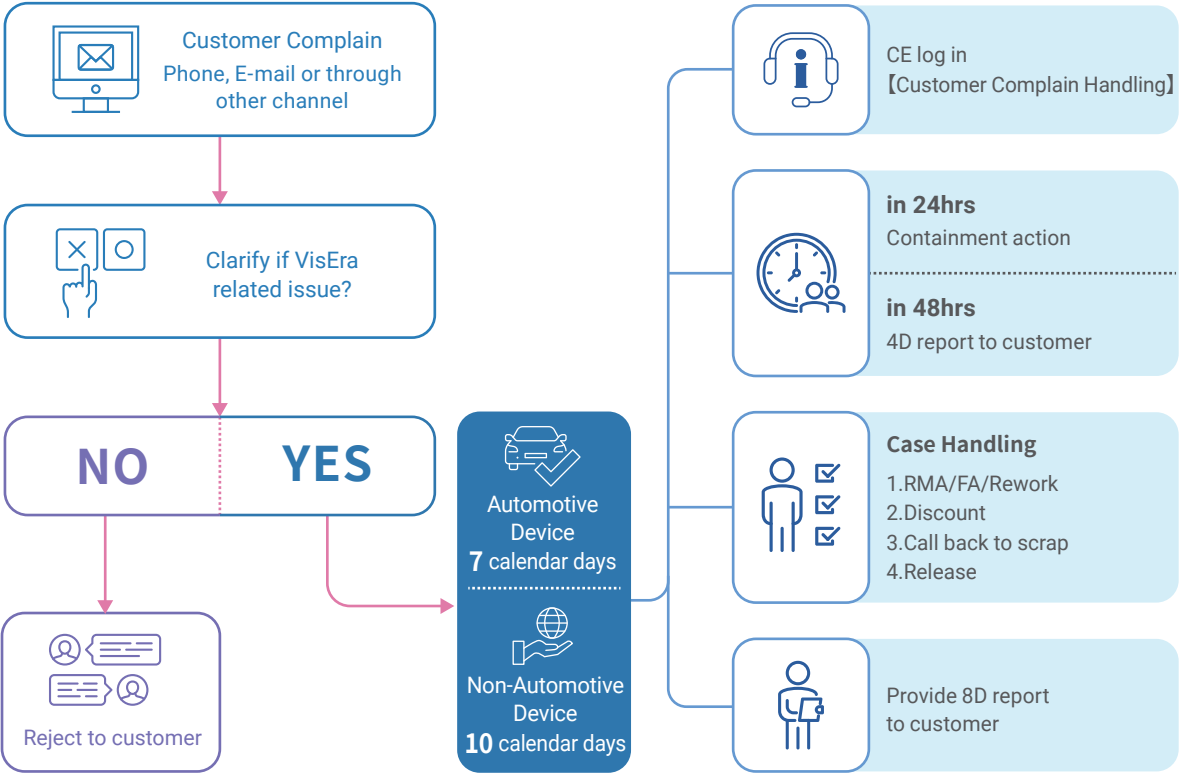
As our customer base grows and their B2B customization requirements increase, we are often constrained by limited IT manpower resources, resulting in extended development schedules when many customers issue requests at the same time. To shorten customer's wait time and increase customer satisfaction, the Company's Business Information Technology Section teamed up with the Purchase Order and Production Plan Unit in 2018 to jointly develop the "B2B Menu design system" designed to effectively reduce IT manpower development and time costs while enhancing customer IT services. They launched the "VisEra Online" platform on June 19, 2018 to provide customers' production lines with accurate and updated information for customers to monitor the product manufacturing schedule, expected delivery date, inventory of finished products, and shipments.

With this system, personnel of the Production Planning Unit can create standardized B2B templates in the "B2B Menu design system" based on the customer's customized fields and formats which cover all incoming and outgoing processes of the product. The information includes the basic transaction records such as delivery of materials, production, completion and inventory, and shipment. It can also be customized based on the customer's preferred points in time and transmission method for receiving B2B reports to meet the customer's needs. It helps customers keep track of the production status and reduces system tracking and inquiry time. It also reduces the time required for the internal development of customized B2B requirements and the time spent on waiting for resources from an average of one month to one week to complete customized B2B information delivery.



In addition, VisEra values the development of sustainable, equitable, and mutually beneficial relationships with customers. If customers have any comments or recommendations, they can contact the Company by telephone, email or the company website. The Company established the Customer Engineering Service Unit as the dedicated unit for processing customer complaints. We also formulated control procedures for processing customer complaints to protect the rights and interests of customers and improve the quality of customer services. In 2024, there were no substantiated complaints concerning breaches of customer privacy and losses of customer data.

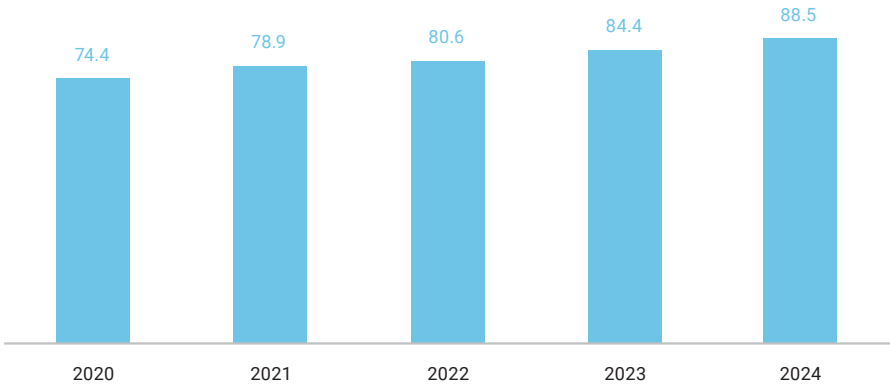
In terms of the procedures for processing customer complaints, we adopted the Eight Disciplines Problem Solving (8D) (i.e., a team-oriented problem-solving approach) in which a dedicated customer complaint handling unit receives related feedback and immediately registers it in the system for case management and tracking. It is required to take preventive measures within 24 hours, submit the root cause analysis report to the customer within 48 hours, and implement relevant improvement measures. The case must be closed within 7 days for automotive products and within 10 days for non-automotive products by reaching a consensus with the customer. We received 2 customer complaint in 2024. (Not related to substantiated complaints concerning breaches of customer privacy and losses of customer data). After internal investigations and optimization of process monitoring methods, both customer complaints were resolved through communication with customers to ensure that the improvement actions were recognized and supported by the customers. The customers agreed to continue shipments and the cases were successfully closed.





VisEra conducts quarterly business technology review meetings with customers to provide products and services of the highest quality and to ensure that customers' needs are fully understood and provided with support. We also conduct annual customer satisfaction surveys of the top ten customers. As of 2024, the top ten customers account for more than 95% of the Company's revenue. We conduct the survey by email or telephone and the survey covers items such as the price/performance ratio, service, delivery, technical service, and future development. The specific implementation method is defined in the Company's customer satisfaction evaluation procedures. We use the VOC (Voice of Customer) system and the NRTO (New/Re Tape out) system to effectively learn about customer requirements and provide rapid response to customers to increase customer satisfaction. To focus on the importance of customer voice, we use a weighted average to more accurately reflect customers' actual evaluation of our services. Customer satisfaction rate reached the score of 88.5 in 2024, which exceeded the target for the year and showing an upward trend year over year. In terms of business technology review, customer Program Management Department schedules quarterly meetings based on the varying needs of customers. These meetings focus on reviewing quality, technical service, delivery, price/performance ratio, service and get customer feedback. Customers are invited to participate in the assessment process. In 2024, the average business technology review score was 90.

Customer satisfaction survey results in the last 5 years



Customer quarterly business review scores in the last 5 years

