Chapter 3. Product Innovation

We are dedicated to producing high-quality, environmentally friendly chemicals products by integrating "Green Chemistry" and "Circular Economy" principles into product strategy and R&D strategies. Through energy-saving, carbon-reducing technologies and sustainable product development, the Company promotes resource efficiency and balanced environmental, social, and economic development. In compliance with the Globally Harmonized System (GHS), the Company manages raw material selection, establishes compliant Safety Data Sheets (SDS), and optimizes processes to reduce solvent use, save water, and maximize material utilization. Products are designed to enhance Use-Phase-Efficiency (UPE) and minimize environmental impact.

Material Topic #5	Product Strategy & R&D Innovation
Impact Assessment	**Positive:** Delivers high-quality chemical products through innovation and safety, reduces resource use and emissions, promotes green production, and builds customer trust. **Negative:** R&D may consume significant energy and water, generate hazardous waste, and pose environmental and community risks.
Management Policies & Commitments (GRI 2-23) (GRI 2-24) (RT-CH-530a.1)	Providing high-quality chemicals and services is a core company value. By embracing continuous improvement and innovation, we respond to diverse customer needs, enhance user benefits, and improve economic performance. We also prioritize health and safety throughout the product life cycle, ensuring compliance with regulations and voluntary standards.
Governance Structure	Group R&D Center, and R&D and technical units of each business division
Management Actions	• Develop products based on the "7 Indicators for UPE Products" to create value. • Link upstream suppliers and downstream users through industry-academia-research collaboration. • Participate in "Industrial Upgrading Innovation Platform Guidance Programs" (e.g., packaging materials for compound semiconductor RF power devices).
Resource Allocation	Invest in R&D funding and manpower, and collaborate with external institutions.
Indicators & Targets (RT-CH-150a.1)	**Management Indicators** / **2024 Target** / **2030 Target** **UPE Product Revenue Ratio (%)** / ≧ 73% / ≧ 77% **New Product Contribution (%)** [Note 1] / ≧ 10% / ≧ 14%
Evaluation Mechanism	Product design and review are conducted through the product development process.
Methods to Ensure Effective Actions	The "UPE Product Revenue Ratio" and "New Product Contribution Rate" are key indicators for material topics, reported annually to senior management.
2024 Execution Results	• UPE Product Revenue Ratio 73% • New Product Contribution 10%
Communication with Stakeholders	The proportion of sustainable products is regularly disclosed through sustainability reports, the official website, and other communication channels.

Note 1: The definition of New Product Contribution (%) is (New Product Revenue / Total Revenue) × 100%.

I. Product Innovation & R&D Achievements

In 2024, the Company invested NT$365,825 thousand in R&D, representing 4.48% of its annual revenue of NT$8,168,220 thousand. The R&D team successfully developed 49 new products, including 18 color chemicals, 6 specialty chemicals, 8 electronic chemicals, and 17 toner products.

The Company defines sustainable Use-Phase-Efficiency (UPE) products based on the 12 Principles of Green Chemistry and the 7 elements for promoting UPE outlined in the SASB standards for the chemicals industry. UPE products should meet the following criteria:

- **Water-saving**
- **Energy-saving (reducing carbon/GHG emissions)**
- **Reduced use of chemicals**
- **Lower VOC (Volatile Organic Compounds) emissions**
- **Reduced environmentally hazardous substances**
- **Extended product lifespan**
- **Use of bio-based raw materials**

Business Division	Product and Technology Features
SCBU	Launched blue light-blocking & UV absorbers to improve durability and reduce environmental impact.
ECBU	Introduced bio-based solvents & low-temperature photoresists to cut energy use and pollution.
CCBU	Released Everclear dyes (for cotton) to reduce dye, water, energy, and wastewater; Everlan AF/MF/CF/NF (for leather) to lower harmful substances and heavy metals.
API	Used reversed-phase chromatography to reduce solvents and boost efficiency.
Toner	Developed low-temperature toner for energy-saving fusing, reducing transport-related emissions.

Patent Applications and Certifications Overview

In 2024, the Company obtained 9 new patents in Taiwan, increasing the total number to 207 domestic patents. The global patent count showed a slight increase. Among them, SCBU added 1 new patent, while ECBU and CCBU each added 6 patents. The total number of granted patents worldwide reached 549, reflecting the company's continued advancement and steady growth in technological R&D.

2023-2024 Cumulative Patent Applications & Grants by Country

Cumulative Number of Applications		Cumulative Number of Grants	
2023	2024	2023	2024
971	980	536	549

II. Implementation of Product Stewardship Management (GRI 416-1)(GRI 416-2)(SASB RT-CH-410b.1)

The Company emphasizes life cycle management across all product stages. In addition to process safety, a dedicated Product Stewardship Department ensures regulatory compliance through SDS and labeling. A comprehensive system is in place to assess and manage product impacts on user health and safety.

2024 Product Responsibility Management Strategies and Outcomes

Product Safety Management Strategy	2024 Execution Results
No use of animal-tested materials.	The Company prohibits the use of animal-tested materials and ensures that all raw materials and products are free from animal-derived ingredients and by-products, in line with international regulations.
Give priority to submitting chemical registration data based on non-animal testing.	Unless specifically required by authorities, toxicological data submitted for chemical registration are prioritized from non-animal testing methods, such as international literature, Quantitative Structure-Activity Relationship (QSAR) models, or read-across approaches. In 2024, 4 substances were registered using such non-animal data sources.
No use of conflict mineral raw materials.	All raw materials are 100% free of the 6 designated conflict minerals.
Continuously optimize hazardous substance management processes.	Following the IECQ QC080000 HSPM system, the company continuously improves hazardous substance management across all stages - from substance identification in R&D and compliant raw material sourcing to investing in precision testing equipment and building in-house testing capabilities. These efforts ensure 100% compliance with international regulations and support the "Zero Discharge of Hazardous Chemicals (ZDHC)" goal in collaboration with supply chain partners.
Use the GreenScreen List Translator™ tool.	1. Continued use of the GreenScreen® List Translator (GSLT) tool to screen chemical substances and product hazards, with findings communicated to the R&D team for appropriate response measures. These actions aim to reduce the use and production of hazardous chemicals, minimize impacts on stakeholder health and the environment, and support the transition toward safer chemical alternatives. 2. Conducted hazard screenings for 840 products sold in volumes over 1 ton in 2024 (496 colorants, 114 specialty chemicals, 44 electronic chemicals, 186 toners). 3. Completed GreenScreen (GS) score assessments for 22 newly added chemical substances in the compositions of the above products (8 colorants, 5 specialty chemicals, and 9 toners). 4. Completed GS score assessments for new raw materials used in factory synthesis in 2024. 5. Maintained Screened Chemistry certification and Environmental Impact Measurement (EIM) scores for 9 colorant products in 2024.
Provide compliant Safety Data Sheets (SDS) and product labelling, along with product safety communication. (GRI 416-2) (SASB RT-CH-410b.1)	1. Developed SDS and labeling procedures to produce multilingual, regulation-compliant documents. Labeling compliance for all 2024 marketed products: 100%. 2. Developed and continuously optimized chemical registration procedures, and completed hazard and risk assessments and national registration for chemical substances and related products. 3. Classified all GHS Category 1 & 2 hazard products (GHS C1/C2), with revenue totaling NT$5.081 billion (62% of 2024 consolidated revenue). All such products underwent 100% hazard and risk assessments as required by company policy. 4. In 2024, a total of 1,325 Product Safety Assurance Statements were issued in response to customer requirements (compared to 1,288 in 2023), with zero product safety complaints (related to hazardous chemicals). 5. Zero product safety labeling complaints, violations, or recalls related to product safety labeling across all business units in 2024.
Product Health Index	1. Completed product health self-assessment: • All products: 100% compliance with RoHS / 99% compliance with SVHCs. • CCBU - Textile & Leather Products: 100% compliance with REACH Annex XVII; over 98% compliance with OEKO-TEX Standard 100 & Leather Standard. • ECBU - 144 products passed third-party testing for RoHS, SVHC, and met customer requirements. 2. Continued to obtain various international product health and safety certifications (see table on the right page): • CCBU & SCBU - For textile, leather, footwear products: ZDHC, bluesign. • CCBU - For textile products: GOTS, Screened Chemistry, EIM Score, The LIST, Adidas adiPCL.

Certified by Third Parties / Testing

Certifications, Labels, and Awards Obtained by Products in 2024:

Business Unit	Certification Type	Country / Industry	Number of Products
CCBU & SCBU	ZDHC MRSL Level 3	Global / Textile, Leather, Footwear	828 (Color Chemicals 824 + UVA 4)
	bluesign	Global / Textile, Leather, Footwear	453 (Color Chemicals 449 + UVA 4)
CCBU	GOTS	Global / Textile Organic Cotton	262
	Screen chemistry & EIM Score	Global / Textile	9
	The LIST V by INDITEX	Global / Textile, Leather, Footwear	798
	Adidas_adiPCL	Global / Textile, Leather, Footwear	76

Mechanism for Assessing Health & Safety Impacts of Product & Service Categories (GRI 461-1)

The Company ensures that its products pose no risk to user health and safety throughout design, development, manufacturing, and sales. Through internal reviews, hazardous substance management, chemical registration, and product SDS preparation, each new product is assessed for health and safety impacts to meet customer and regulatory requirements.

To enhance product health and safety, the percentage of newly assessed product and service categories that completed Health and Safety (HSF) evaluations in 2024 is shown below (excluding the Pharmaceutical and Toner Business Units).

Business Unit	CCBU	SCBU	ECBU	Total
No. of Items	23	4	6	33
Percentage (%)	70%	12%	18%	100%

In 2024, a total of 33 products underwent user health and safety assessments. No products required modifications based on identified health and safety concerns.

III. Application of Green Chemistry Principles in Product Life Cycle (RT-CH-410b.2)

The Company implements the 12 Principles of Green Chemistry throughout the product life cycle to minimize adverse environmental impacts and prevent harm to human health.

The following outlines the objectives for applying the principles of green chemistry at each stage of the product life cycle, along with case descriptions for 2024.

Life Cycle Stage	Target	Action	2024 Case Study	Compliant Green Chemistry Principles
Raw Material Selection and Usage	Select sustainable, environmentally friendly, and legally compliant materials.	• Prioritize eco-friendly, safer, bio-based, and recyclable materials. • Avoid SVHCs, toxic, and regulated substances via hazard assessments. • Identify hazardous substances, inspect incoming materials, and set specifications. • Ensure compliance with ZDHC, Bluesign®, OEKO-TEX, and RoHS standards.	1. Bio-based solvents used in polyimide photoresists. 2. Plant- and E. coli-based adhesives reduce petrochemical reliance. 3. Low-temperature resins selected to save energy. 4. Low-VOC resins used in toner to cut emissions; rice bran wax applied in development.	Low toxicity, renewable, waste prevention
Raw Material Transportation	Ensure safety and proper handling of materials during transportation	• Require suppliers to provide GHS-compliant Safety Data Sheets (SDS) and labeling.	Manage the storage and safe use of chemicals within the plant in accordance with Safety Data Sheets (SDS).	hazard awareness
Manufacturing	Maintain product quality while minimizing environmental impact.	• Increase Atomic Utilization Rate. • Reduce high- & low-temperature processes to cut energy use. • Optimize material recycling & reuse, and use recycled solvents. • Lower water use and hazardous substances. • Develop low-energy & low-VOC processes.	1. Low-temperature baking reduces energy use in electronic chemical production. 2. Dual-feed system enables in-process material recycling.	Resource efficiency, renewable, energy saving, low toxicity, waste prevention
Product Packaging	Use recyclable packaging materials and reduce the use of single-use packaging.	• Label packaging for recycling and classification • Reuse and optimize packaging • Use sustainable cardboard packaging • Simplify shipping packaging	1. Packaging is labeled with internationally recognized recycling codes to support customer sorting. 2. Promoted packaging reuse with domestic customers and bulk deliveries, cutting material use - e.g., large-capacity toner packaging reduced plastic waste over 30 times. 3. Adopted FSC-certified cartons with 100% recycled inner liners and up to 70% recycled outer layers. 4. Optimized packaging selection and encouraged customers to reuse packaging through active communication.	Renewable, waste prevention

Life Cycle Stage	Target	Action	2024 Case Study	Compliant Green Chemistry Principles
Product Transportation	Ensure safe transportation, reduce carbon emissions, and achieve on-time delivery.	• Provide detailed Safety Data Sheets (SDS), including safe handling and storage guidelines. • Optimize container loading to reduce transportation distances. • Collaborate with logistics providers to utilize return vehicles and avoid empty trips. • Promote the use of recycled pallets to reduce the purchase of new ones.	1. Replaced diesel forklifts with electric models for loading operations to reduce energy use and emissions. 2. Improved transport efficiency through cargo consolidation and maximized loading. **Marine Transport:** • Maximized container loading to fully utilize space and improve efficiency. • Consolidated goods from different business units for joint shipments, reducing carbon footprint. • Selected the nearest container yards and ports to shorten transport distance. • Centralized bulk shipments to further enhance efficiency. **Land Transportation (Taiwan):** • Optimized delivery routes in northern Taiwan based on customer location to minimize distance. • In central and southern Taiwan, worked with carriers to use return trips and avoid empty runs. • Used recycled pallets from raw material suppliers to reduce the need for new pallets.	Renewable, energy saving, waste prevention
Product Use	Offer high-efficiency UPE products that reduce environmental impact during use.	• Develop water- and energy-saving products (e.g., high-fixation dyes, low-temp toners). • Provide low-VOC, low-chemical, durable products to extend lifespan (e.g., UV coatings). • Develop high-performance materials (e.g., low-temp photoresists).	The Everclear series dyes reduce dye usage by 40%, save 40% of water resources, and lower carbon emissions by 72%.	Energy saving, waste prevention
End-of-Life Management for Products and Packaging	Minimize environmental impact through proper disposal and product recycling.	• Provide detailed Safety Data Sheets (SDS) with disposal guidelines, advising on recycling, licensed disposal, and reuse to prevent pollution. • Ensure clear recycling classification labels on all packaging materials.	1. Dispose according to the SDS instructions or applicable national regulations. 2. Increase packaging recycling rates and reduce waste generation.	Renewable, waste prevention

Chemical and Packaging Material Recycling

To align with Green Chemistry's principles of regeneration and maximum resource utilization, the Company has tracked chemical and packaging material recycling over the past four years. In 2024, the pharmaceutical business unit significantly improved its solvent recycling rate from 8% to 48%. However, the overall Company chemical recycling rate remained between 0.5% and 1.1%, reflecting challenges in other business units.

Packaging recycling has been more stable, with recovery rates exceeding 80%, especially for bulk bags, one-way drums, and plastic bags - demonstrating real progress in circular economy practices. For more details, see Chapter 5: "Waste Management" and "Circular Economy."

Material Recycling Rate Analysis

(Unit: Metric Tons)

Items	Year	Chemicals			Packaging Materials			Chemicals + Packaging Materials		
		General Materials	Recycled Materials	Recycling Percentage (%)	General Materials	Recycled Materials	Recycling Percentage (%)	General Materials	Recycled Materials	Recycling Percentage (%)
Total	2021	55,996.6	427.7	0.8%	1,181.6	4,845.6	80.4%	57,178.2	5,273.2	8.4%
	2022	45,239.7	250.2	0.5%	789.5	4,435.7	84.9%	46,029.2	4,685.9	9.2%
	2023	43,770.2	349.3	0.8%	737.5	4,083.7	84.7%	44,507.7	4,433.0	9.1%
	2024	52,792.6	595.3	1.1%	777.9	3,284.8	80.9%	53,570.5	3,880.1	6.8%

IV. Quality & Customer Relationship Management

Quality Management | Quality Policy | Quality Management Targets | Quality Management Certifications | Customer Relationship Management | Customer Communication & Frequency

Customers are key stakeholders for the Company, spanning diverse industries including textiles, leather, plastics, coatings, optoelectronics, semiconductors, healthcare, automotive, and electronics. Upholding the brand value of "Customer First," the Company is committed to supporting customers' success with high-quality products, services, and technical support. Based on the "9-A7-11 Quality Management Review Procedure" and the PDCA cycle, internal audits and management reviews are conducted annually. An annual review meeting, chaired by the General Manager, was held on Jun 11, 2024, covering system performance, customer satisfaction results, and quality improvement plans.

Monthly plant/department quality meetings, led by plant or department heads, focus on reviewing quality status, addressing customer feedback, and implementing improvements to ensure the system's continued effectiveness.

2024 Implementation Results & Key Actions:

1. The Sales Division regularly arranged customer visits to maintain consistent communication and meet engagement goals.
2. Passed customer audits and verifications, including ESG documentation reviews and third-party on-site inspections by TÜV and DNV.
3. Achieved an overall customer satisfaction score of 90, exceeding the annual target (≥88).
4. No incidents of non-compliance with quality management regulations were reported.

As part of our marketing efforts, we have implemented the following sustainability actions:

1. Increased virtual meetings to reduce travel and carbon emissions.
2. Adopted eco-friendly exhibition design using recyclable booth materials and digital screens in place of printed posters.
3. Used energy-efficient LED lighting in booths; received the TOUCH TAIWAN Green Decoration Design Award for multiple consecutive years.
4. Strengthened digital marketing via Facebook, LinkedIn, and WeChat for real-time promotion and engagement.

2024 TOUCH TAIWAN Green Decoration Design Award

Utilize energy-saving LED lighting for exhibition areas

In environmental services and advocacy, business and technical service units actively promote UPE products to a global audience. They engage with target customers focused on sustainable solutions, ensuring that marketing efforts resonate with like-minded clients and contribute to the promotion of eco-friendly products, making a tangible impact on environmental protection.

Feature Report on Award Recognition

Awarded the Taiwan Excellence Gold Award - A New Milestone for B2B Specialty Chemicals

At the 33rd Taiwan Excellence Awards, Everlight Chemical's IBR/IPR Series UV-Blocking Adhesives earned the prestigious Gold Award, marking the first time a B2B chemical product has received this honor in the award's history - a new benchmark for the industry. This achievement follows the Silver Award received at the 32nd Taiwan Excellence Awards for the Eversorb® AQ light stabilizer series, signifying another major milestone.

Core Technologies and Breakthroughs

The IBR/IPR Series UV-Blocking Adhesives integrate multiple innovative technologies, with key achievements including:

- **Automation-Ready:** Compatible with automated dispensing and UV curing, reducing labor and energy costs.
- **Slim Design Support:** Light-shielding zone reduced from 20 mm to 1 mm, enabling frameless curved and modular displays.
- **Eco-Friendly Formulation:** Solvent-free, VOC-free, with stable viscosity and efficient positive-pressure dispensing.
- **Sustainability Benefits:** Cuts ~10.4 tons of VOCs annually; 100% atom efficiency; 50% energy savings vs. traditional methods.
- **Patented Innovation:** Patents granted in Taiwan and China for glass adhesion and reworkability; weatherability patent pending.

Eversorb® MPU Functional Masterbatch Products Received the Silver Award at the 2024 Taipei International Rubber & Plastics Industry Show (TaipeiPLAS)

Two Breakthrough Products: Advancing Both Performance and Sustainability

1. Eversorb® MPU620 Weather-Resistant Masterbatch

Achieves a yellowing resistance rating of 4-4.5 (compared to only 0.5 for the control group), effectively delaying product yellowing for over one year and extending the product's service life and visual appeal of shoe midsoles.

2. Eversorb® MPU Color Masterbatch

Produced through a chemical synthesis process to ensure uniform color dispersion without affecting the foaming process. The product maintains excellent color fastness, migration resistance, and solvent resistance. It delivers vivid color options while preserving the stability of foam processing and the aesthetic quality of the final product.

Creating Value

The global athletic footwear industry generates approximately 1.5 million tons of waste annually, with over 70% of it being non-recyclable. Each pair of shoes emits an average of 13.6 kg of CO_2 equivalent from production to disposal. Utilizing 100% recyclable supercritical foaming technology can reduce carbon emissions by up to 80%, significantly lowering the environmental impact. It is estimated that within the next five years, around 100 million pairs of shoes will adopt supercritical foamed TPU midsoles.

Everaox® 501：An Innovative Sustainable Solution for PU Antioxidant

FEIPUR 2024 is the largest trade event in South America for the composites and polyurethane industries. In collaboration with our Brazilian distributor, Braschemical, Everlight Chemical promoted its multifunctional heat-resistant product, Everaox® 501, and was honored with the FEIPUR 2024 Advanced Materials Excellence Award.

Environmental and Technical Advantages

- Multifunctional formulation reduces the use of chemicals
- Minimizes scrap caused by scorching, enhancing production efficiency
- Inhibits yellowing and extends product lifespan

2024 Advanced Materials Excellence Award
Braschemical, our exhibition distributor, accepted the award on the Company's behalf.