Responsible Product

04

Core Technology and Intellectual Property Management 50

Sustainable Product Design and Lifecycle Integration 52

Green Logistics 57

Hazardous Substance Management 58

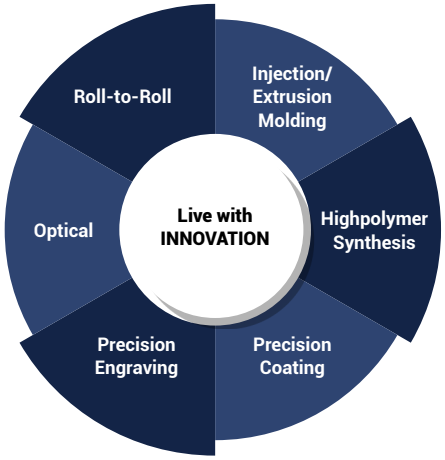
Product Safety and Marketing Labels 60

foreword 0
BenQ Materials Introduction 1
Sustainability Governance 2
Responsible Governance 3
Responsible Product 4
Environmental Sustainability 5
Partnership 6
Friendly Workplace 7
Social participation 8
Appendix 9

Core Technology and Intellectual Property Management

Six Core Technologies

BenQ Materials has established six core competencies through years of advancement in optical design, material development, and process optimization. These include two material technologies—optical multilayer film design and polymer synthesis—along with four process technologies: roll-to-roll processing, precision embossing, precision coating, and injection and extrusion molding.



Production Processes

BenQ Materials categorizes its products into Display Materials, Battery Materials, Medical and Healthcare Products, and Functional Textiles. Manufacturing is conducted in-house across five major operational sites, each aligned with specific product lines and production processes.

- Display Materials and Battery Materials are distributed directly to B2B clients.
- Medical and Healthcare Products and Functional Textiles are delivered through various channels, including B2B clients, distributors, healthcare institutions, and e-commerce platforms, depending on product characteristics.

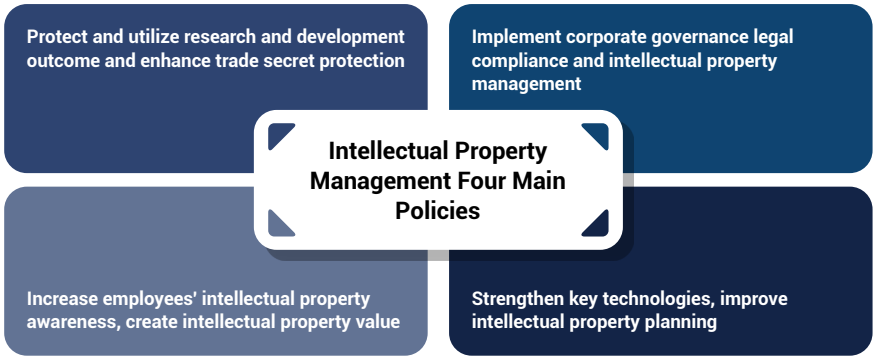
Each production line is integrated with its respective operational site and manufacturing technology, ensuring process efficiency, quality assurance, and traceability across the value chain, in alignment with sustainable operations and product responsibility principles.. The corresponding operating sites and production processes of each product line can be found on the BenQ Materials ESG website.

Intellectual Property (IP) Management

Intellectual property (IP) plays a key role in safeguarding R&D outcomes and maintaining technological competitiveness. BenQ Materials is committed to continuously developing core technologies by integrating R&D with product innovation. Through the reinforcement of IP strategies and regular performance reviews, the company aims to enhance IP robustness, ensure freedom to operate, and strengthen its competitive edge.

BenQ Materials has formulated an intellectual property management plan that is closely aligned with its business strategy. The plan is implemented through a comprehensive management system to ensure the timely protection, effective management, and optimal utilization of high-potential technologies and innovations derived from R&D, manufacturing, and operations.

As a diversified brand operator, the company also focuses on enhancing and protecting brand value to ensure a strong professional image and sustained market competitiveness. In 2024, BenQ Materials' IP policies and goals are centered on strengthening IP portfolio deployment, steadily accumulating IP assets, increasing employee awareness of IP, and reinforcing the protection of R&D outcomes and confidential information — thereby maximizing the value of intellectual property.



Intellectual Property Management Goals

1	Develop intellectual property management plans linked to operational goals and continuously promote the TIPS intellectual property management system, regularly reporting the implementation status of intellectual property management plans to the Board of Directors and disclosing them on the official website.
2	Implement intellectual property management, integrating various intellectual property management regulations, and clearly establishing the relevance of various intellectual property-related operating procedure documents.
3	Strengthen the R&D document management system, fully digitizing R&D records.
4	Establish a patent information monitoring system.
5	Regularly conduct internal audits and hold management review meetings, as well as organize education and training courses for working groups.
6	To enhance employees' intellectual property awareness, organize educational training courses, including: (a) Intellectual property courses for new employees. (b) Advanced intellectual property courses for R&D personnel. (c) Advanced training courses for intellectual property specialists.

Intellectual Property Management System

BenQ Materials actively promotes the implementation of its intellectual property (IP) management system by strengthening the scope of IP governance and embedding operational procedures into daily practices. In 2021, the company obtained certification under the Taiwan Intellectual Property Management System (TIPS), receiving an A-grade (TIPS-2021-cert.-052). This certification was successfully renewed in both 2022 and 2024, with A-grade certifications (TIPS-2022-cert.-015 and TIPS-2024-cert.-044), valid through December 31, 2026.

Intellectual Property Management Measures and Objectives

1 Optimization of the TIPS Management System

In accordance with the Taiwan Intellectual Property Management System (TIPS) standards, BenQ Materials has established an IP management manual to serve as the operational basis for implementing its IP management system, ensuring the effectiveness of IP governance and execution.

2 Patent Management

Patent management encompasses R&D recordkeeping, patent application and maintenance assessments, incentive mechanisms, and portfolio strategies aimed at strengthening the company's overall patent quality and competitive edge. Additionally, a review mechanism is in place to evaluate R&D outcomes before public disclosure, thereby safeguarding trade secrets and mitigating the risk of information leakage.

3 Trademark Management

BenQ Materials enforces a structured process for trademark application and usage oversight. The company regularly updates its trademark inventory and monitors usage to prevent infringement risks, while actively planning and deploying brand-related trademark strategies.

4 Brand Management

In alignment with internal brand management policies, brand assets are systematically managed. Awareness sessions on brand usage standards are held within the organization to reinforce compliance.

5 IP-Related Education and Awareness

Internal Training: Annual online training on general IP concepts and trade secret protection is mandatory for all employees, with dedicated courses for R&D staff. In 2024, TIPS and trade secret protection e-learning courses were conducted company-wide, with a 94% completion rate. Additionally, advanced patent courses were delivered to senior R&D staff, with a 100% pass rate.

External Training: IP officers completed the 2024 TIPS Tiered IP Management Training for A-level and AA-level certification (2 attendees) and participated in other specialized external courses, accumulating 71.5 hours of professional training over the year.

Intellectual Property Management Achievements

Patents

As of December 2024, BenQ Materials has filed over 1,290 patent applications globally and has been granted more than 830 patents. The company's patent portfolio spans key markets and countries, including Taiwan, the United States, the European Union, Japan, Mainland China, South Korea, India, and Southeast Asia.

In 2024 alone, BenQ Materials filed more than 64 new patent applications and received 40 granted patents. The core technological fields include battery separator films, functional optical film technologies, and biomedical dressings.

Aligned with the company's commitment to circular economy and sustainable development, a portion of the 2024 patent filings focused on innovations utilizing recycled materials—specifically, the application of regenerated polyester derived from recycled polyester waste in functional textiles and optical films. For further details, please refer to the BenQ Materials official website.

Patent Outcome	2020	2021	2022	2023	2024
Number of Applications	63	44	39	78	64
Number of Certificates Granted	30	37	38	33	40

Trademarks

BenQ Materials has filed over 500 trademark applications globally and has been granted 484 trademark registrations. In 2024, the company filed 30 new trademark applications and successfully obtained 30 trademark rights. The trademark portfolio covers major markets including Taiwan, the United States, the European Union, Japan, Mainland China (including Hong Kong), Southeast Asia, and Oceania (Australia and New Zealand).

Region	Taiwan	United States	China	European Union	Southeast Asia	Others	Total
Registered Trademarks	161	7	181	19	81	35	484

Collaborative Innovation with Academia

To continuously enhance its innovation capabilities and product competitiveness, BenQ Materials has actively engaged in academic-industry collaborations with leading research institutions in Taiwan in recent years. Strategic partners include:

- Industrial Technology Research Institute (ITRI)
- National Tsing Hua University
- National Cheng Kung University
- National Taiwan University of Science and Technology
- Chang Gung University
- National Yunlin University of Science and Technology
- Far East University

These partnerships span diverse technology domains such as smart healthcare, solid-state battery materials, advanced material development, and biomedical engineering.

In 2024, BenQ Materials executed five collaborative R&D projects, with a total investment of over NTD 6 million in joint research and development efforts.

Sustainable Product Design and Lifecycle Integration

To realize sustainable product value creation, BenQ Materials has formally incorporated the requirement that "100% of new product developments must comply with internal sustainability criteria" into its official Product Development Procedures. The company has adopted a Lifecycle Thinking approach that encompasses all stages—from design, manufacturing, and logistics, to usage, maintenance, and end-of-life disposal.

Product design principles are aligned with circular economy concepts and are assessed through an internal sustainability evaluation checklist across six key dimensions:

- Structural Optimization
- Use of Environmentally Friendly Raw Materials
- Incorporation of Recyclable Materials
- Low Environmental Impact Components
- Reduction in Product Packaging
- User Safety and Health Considerations

Several products have already obtained third-party carbon footprint certifications (refer to Section 5-2-3: Greenhouse Gas Management for details).

GHG Reduction Targets for Major Products	2025	2027	2030
Baseline year:2020	-30%	-45%	-55%
Low-Carbon Strategies for Existing Products	Low-Carbon Materials	• Material down-gauging and weight reduction design • Adoption of bio-based and recycled materials • Improved material utilization to minimize waste	
	Low-Carbon Processes	• Streamlining of manufacturing processes • Enhanced output efficiency • Energy-efficient equipment upgrades	
100% Sustainability Compliance for New Products Incorporated into the Product Development Procedures across all major product lines: ☑ Display Materials ☑ Advanced Battery Materials ☑ Medical and Healthcare Products ☑ Waterproof and Breathable Textiles	Planning Phase	• Material selection must meet low-carbon and environmentally responsible sourcing criteria • Application of DOE (Design of Experiments) methodology for dosage optimization • Product structure must enable recyclability • Process design emphasizes low energy consumption	
	Design Verification Phase	• Packaging and logistics methods reviewed and optimized to reduce GHG emissions • Product carbon footprint testing and inventory assessment conducted	
	Mass Production Verification Phase	• Carbon reduction improvement plans established, targeting >20% emission reduction within five years	

Display Materials

Aspect	Design Principle	Environmental Benefits
Design	**Structure optimization**	**The goal of structural optimization is to reduce material thickness while maintaining functional specifications, with actual product thickness determined by customer requirements.** Polarizer: • OLED products reduced from 130 μm to 98 μm, achieving a 25% total thickness reduction. • Overall layer thickness reduced by 30%, decreasing material consumption. • Automotive products reduced from 133 μm to 118–122 μm, lowering total thickness by 8–11%. • For thinner TV polarizers, base film reduced from 80 μm to 40 μm (22% reduction). Based on 150K 85-inch TVs per month, this saves 32.2 tons of plastic—equivalent to 1.48 million PET bottles. PDLC Smart Optical Film: • Adhesive layer is the thinnest in the industry at 8–10 μm (industry average 15–20 μm). • Conductive layer is the thinnest in the industry at 125 μm (industry average 188 μm).
	Eco-Friendly Raw Materials	Polarizer: • Solvent-free pressure-sensitive adhesive: formulation and process redesigned to reduce carbon emissions by 18%. • PFAS-free pressure-sensitive adhesive: in development, targeted for completion by end of 2025. • PFAS-free protective film: under validation for automotive applications, targeted for completion by end of 2025. PDLC Smart Optical Film: • Transparent conductive films deliver industry-best visual quality and optical performance. Series 97/95 offers the highest transparency and lowest haze. Optical Adhesives: • Biomaterial introduction targeted for 2025, projected to reduce emissions by 6% vs baseline. • New product development goal for 2025: 25% carbon reduction vs baseline.
	Recyclable Materials	Polarizer: • Recovery of process chemicals and reuse of packaging materials reduces total waste (see 5-6 Circular Economy). Optical Adhesives: • In 2024, passed PET recycling validation; full implementation expected in 2025.
	Low-Impact Components	Optical Adhesive • Solvent-free production eliminates oven baking, reducing electricity consumption and GHG emissions. Acid-free formulation enhances safety and reduces environmental harm. • In 2024, EAC (ethyl acetate) usage reduced by 6% through resin reformulation. PDLC Smart Optical Film: • Waste mainly consists of glass, which has lower environmental impact during treatment and recycling.
	Product safety	Polarizer: • All raw materials comply with EU RoHS regulations. Optical Adhesives: • YUNTECH facility certified to ISO 9001, ISO 14001, and IATF 16949. • PFAS alternatives are under evaluation. PDLC Smart Optical Film: • Complies with REACH, RoHS, and Green Product (GP) standards.

foreword 0
BenQ Materials Introduction 1
Sustainability Governance 2
Responsible Governance 3
Responsible Product 4
Environmental Sustainability 5
Partnership 6
Friendly Workplace 7
Social participation 8
Appendix 9

Aspect	Design Principle	Environmental Benefits
Manufacture	High-Efficiency Production	• Process speed-up from 10m to 15m/min through bottleneck upgrades, increasing monthly output by 10km². • Introduced 21 RPA (robotic process automation) improvements in 2024, saving 369 hours per quarter.
Logistics	Green Packaging	Polarizer: • Low-carbon packaging reduced 3 tons CO_2e compare to 2023 (For detailed information, please refer to section 4-3-3) • Average recycling rate of circular packaging: 93% (For detailed information, please refer to section 4-3-4)
	High-Performance Delivery	• Low-carbon transportation saved 3,208 tons CO_2e (For detailed information, please refer to section 4-3-2)
Use, Maintenance, End-of-Life	High-Performance Products	Polarizer: • Low-reflective coating increased transmittance by 2%, reducing required LED backlights and energy use. • Adjusted iodine concentration, stretching ratio, and molecular alignment to increase transmittance by 2% without sacrificing polarization. Optical Adhesive: • Improved panel transmittance by ~20%, reducing power consumption. PDLC Smart Optical Film: • Certified as Taiwan's first green building smart film: blocks >99% UV and >87% IR, reducing indoor heat. Compared to regular glass, tested to cut electricity use by 19%, or ~96.38 kg CO_2e. • Energy saving compared to thermal film: 10–13% in transparent mode, 13–18% in opaque mode.
	Product Lifetime	Polarizer: • Ongoing development of high-durability versions (thermal resistance from 500h to 1,000h), adjusting process chemicals and parameters. Completion expected mid-2025. PDLC Smart Film: • Passed 2,500–3,000h internal weather resistance tests and verified by NCKU Lab (QUV 1,500h), exceeding industry standards. Now offered with 5-year warranty, lifespan estimated at 10+ years (vs. 1-year industry norm).
Social Contribution	Environmental Impact	Polarizer: • High-transmittance versions reduce energy consumption by 2%, confirmed by customer testing. PDLC Smart Film: • Indoor heat insulation reduces energy use by 19%, equating to 96.38 kg CO_2e reduction.
	Social Impact	Polarizer: • The reflectance of low-reflection polarizers has been reduced from 5% to below 2%, thereby minimizing the impact of ambient light on the human eye. This effectively reduces eye fatigue during prolonged use of displays. Optical Adhesives: • Boost panel light output; near-zero hazardous emissions during production minimize user health risks. PDLC Smart Film: • Filters indoor UV radiation, protecting occupants and furniture.

Advanced Battery Materials

Aspect	Design Principle	Environmental Benefits
Design	Structure optimization	• Product thickness in 2024: 10 μm; 2025 target: 9 μm. • Coating thickness in 2024: 1 μm; 2025 target: 0.8 μm.
	Low-Impact Components	• Utilization of polyolefin materials, which are relatively environmentally friendly. • Separator production adopts an organic solvent-free (dry) process, minimizing environmental impact. • Next-generation high-power separator (Armarator) is under development, emphasizing ceramic coating, water-based processing, and environmentally friendly design.
	Product safety	• Established independent quality verification mechanisms aligned with ISO, IQC, IPQC, FQC, OQC, and IATF 16949 standards to ensure optimal product quality and safety during customer integration into battery/cell production processes. • In-house battery testing line: Development-stage separators are benchmarked against competitor products and diverse models to validate performance and simulate downstream application scenarios, increasing product development success rate.
Manufacture	High-Efficiency Production	• Automation has improved material supply and inspection efficiency by 40% compared to 2022. • Roll length per unit increased by 87.5%, with a 0.1% yield improvement and a 16% increase in slitting equipment utilization. • Process optimization in 2024 reduced material waste by 1% and energy consumption by 22% (vs. 2023). • Equipment self-maintenance rate reached 83% in 2024.
Logistics	Green Packaging	• Optimized packaging reduced material use and improved container utilization, resulting in cost savings. Core reuse lowered waste by 59.2 metric tons; 53,267 cores were recycled with a reuse rate of ~98%. • Additional recovery systems for supporting cores and pallets introduced, reducing packaging material expenditure by an estimated 22%. • Discontinued certain cushioning foams in 2024, reducing packaging waste by 75%. • Switched from wooden pallets to reusable plastic pallets in 2024, projected to reduce 90 tCO_2e.
Use, Maintenance, End-of-Life	Product Lifetime	• Low internal resistance process improves battery cycle life; precision pore control technology helps mitigate performance degradation post-cycling. • Next-gen high-power separator (Armarator) features improved durability: melt-down temperature exceeds 300˚C and brittle point reaches 250˚C—higher than industry average. • Developed lithium-replenishment technology in 2024 to significantly extend battery cycle life.
Social Contribution	Environmental Impact	• Process efficiency and yield improvements have led to a 64% reduction in carbon emissions compared to the 2020 baseline. • In 2023, obtained ISO 14067:2018 Product Carbon Footprint certification for one separator product.

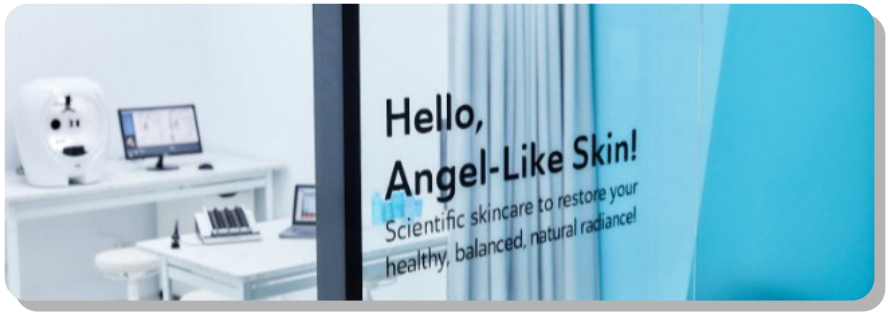
foreword 0
BenQ Materials Introduction 1
Sustainability Governance 2
Responsible Governance 3
Responsible Product 4
Environmental Sustainability 5
Partnership 6
Friendly Workplace 7
Social participation 8
Appendix 9

Healthcare and Nursing Products

Aspect	Design Principle	Environmental Benefits
Design	**Structure optimization**	Skin Care: • Mass production of crescent-shaped patches improves film material utilization by ~19.8% and release liner utilization by ~10.6% compared to acne patches. • Square-shaped patches improve film material utilization by ~20.2%. • At the Yunlin plant, producing 12mm acne patches achieves ~5.0% higher film utilization and ~15.0% higher liner utilization than at the original Taoyuan plant. Vision Care: • Manufacturing process adopts low-polypropylene plastic lids, reducing polypropylene usage by 60%. Wound Care: • New hemostatic product under development is expected to reduce carbon emissions from materials and processes by ~50%.
	Eco-Friendly Raw Materials	Medical packaging: • In-house film production integrated with solvent-free lamination reduces impact on human health and the environment. • Over 40% of bag-making medical films now use this method. • EVA water-based adhesive to be introduced in 2025. Skin Care: • Skincare products formulated without alcohol, fragrance, or color additives. • Sunscreen uses ocean-friendly formulations and excludes ingredients banned by Palau. Vision Care: • Future plans to adopt more comfortable materials for end-user wear. Wound Care: • Developing antimicrobial hydrogels using natural polymers with low toxicity, derived from renewable resources (in progress).
	Recyclable Materials	Skin Care: • Switching to recycled plastic for release liners is expected to cut carbon emissions by 47.8% compared to originals, reducing ~14.8% carbon per acne patch. Full implementation targeted for 2025 Q3. Vision Care: • Since 2022, consumer campaigns in Taiwan and China promote recycling of polypropylene lens cups.
	Low-Impact Components	Skin Care: • Uses solvent-free materials and manufacturing, minimizing health and environmental risks from volatile organic compounds (VOCs). Vision Care: • Proprietary EautraSil®Plus hydrophilic silicone technology eliminates solvent use, avoiding solvent residues and minimizing eye irritation and allergy risks. Wound Care: • In developing next-gen antimicrobial products, current substances on the REACH Substances of Very High Concern (SVHC) list are being replaced with alternatives to reduce environmental impact while enhancing product performance.
	Product safety	Medical packaging: • Certified under EU MDR and US FDA compliance. Skin Care: • Acne patches pass cytotoxicity, sensitization, and aging tests; skincare products pass high-standard stability, dermal compatibility, and functionality tests. Vision Care: • All contact lens products comply with GP standards and medical device regulations in respective countries. Wound Care: • Certified under ISO 13485 (Medical Device QMS) and ISO 10993 (Biocompatibility).
Manufacture	**High-Efficiency Manufacturing**	Wound Care: • Process improvement in 2024 increased gauze yield by 0.9%. • Alcohol recovery system for gauze production introduced in 2024, reducing alcohol use by ~80 metric tons. Skin Care: • Introduction of magnetic soft blades in 2024 enhanced efficiency by 80% and reduced blade cost by 90%. Vision Care: • 100% automated surface optical inspection; 2024 utilization rate reached 82%, a 4% increase from previous year. • 100% recovery of printing steel plates used in contact lens manufacturing. • 100% recovery of polypropylene molds from preform stages for downstream reuse. • Process optimization extended alcohol usability, saving 4 tons in 2024. • Replacement of high-energy equipment in 2024 led to a 59% carbon emission reduction compared to 2021 baseline. • Tray system introduced for product storage, replacing zipper bags. • Nitrogen-saving system implemented in 2024, reducing consumption by 28% per unit. Medical packaging: • Production scheduling optimization in Q4 2024 estimated to reduce material waste by 5 metric tons/month. • Equipment upgrades in 2024 increased overall production capacity by over 20% compared to 2023.
Logistics	**Green Packaging**	Wound Care: • 100% FSC-certified packaging achieved for new products; 65% for total product portfolio. Remaining gaps due to certification delays for hemostatic products in the EU. • 2024 packaging optimization project consolidated carton SKUs, saving ~250 units per stock cycle. Skin Care: • Achieved 100% FSC certification across all products in 2024. • Switched to recycled paper boxes in Taiwan, achieving a 34% transition rate and reducing total packaging carbon emissions by 6.1%. • Replaced aluminum foil packaging with recycled paperboard, lowering material carbon emissions by 62%, saving 16% in production cost, and reducing total packaging carbon emissions by 14%. China plant to implement by 2025. • QR codes and product claims are now directly printed on packaging; China's 2024 implementation rate reached 90%, reducing carbon emissions by 34% and packaging material by 0.1%. Vision Care: • 100% FSC adoption for new products in 2024, accounting for 15% of SKUs. Legacy products are being phased out and not updated. • Product instruction manuals now printed inside boxes in China, reducing paper use and ~1.48 tCO_2e emissions. • Plastic wrap sealing for new products to be eliminated in 2025. Medical packaging: • Reduced external carton strapping usage by over 400 kg annually. • Stopped printing customer logos on domestic shipment cartons. • Modified packaging for large film rolls, cutting carton usage. • Converted paper cores to reusable plastic cores in 2024, saving over 2 metric tons of material.

foreword 0
BenQ Materials Introduction 1
Sustainability Governance 2
Responsible Governance 3
Responsible Product 4
Environmental Sustainability 5
Partnership 6
Friendly Workplace 7
Social participation 8
Appendix 9

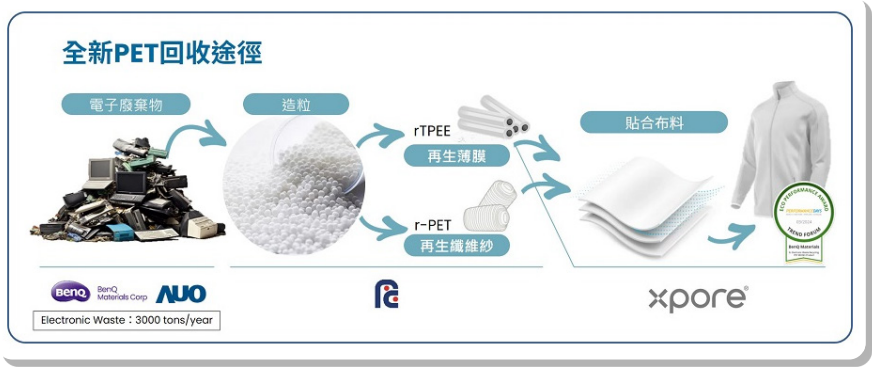
Aspect	Design Principle	Environmental Benefits
Logistics	**High-Performance Delivery**	Wound Care: • Centralized sterilization via third-party providers reduced trips during production planning; compared to 2023, cut travel by 1,800 km and fuel use by 225L in 2024, lowering emissions by ~520 kg CO_2e. Skin Care: • Double stacking of shipping containers increased efficiency by 33% (67 containers planned, 45 shipped). • Switched from loose cargo to palletized shipping, cutting costs by ~62.3%. Vision Care: • Some logistics partners transitioned to low-emission vehicles. Medical packaging: • Adopted multi-drop domestic delivery routes, reducing freight costs by ~25%.
Use, Maintenance, End-of-Life	**High-Performance Products**	Wound Care: • QuikNing Gauze demonstrates superior exudate absorption, with an average absorption ratio exceeding 14 times its weight. Clinical trials show it achieves twice the bleeding control effectiveness compared to conventional gauze. Skin Care: • DermaAngel Acne Patch delivers 3–5 times the absorption efficiency of leading market brands. • Surface features matte finish technology to reduce reflectivity and enhance discreet wear. Vision Care: • Oxygen permeability (Dk/t) reaches 193, six times higher than conventional hydrogel lenses, promoting ocular respiration. • Triple-layer encapsulation technology (Color Lock Technology) ensures pigment security and non-fading performance.Solvent-free formulation reduces allergen risk and environmental impact. • Proprietary EautraSil®Plus hydrophilic silicone technology creates a highly hydrophilic matrix, reducing protein/lipid deposition and enhancing clarity while lowering risks of allergic reaction and bacterial infection. • Enhanced moisture retention and prolonged wear comfort. • Ergonomic optical design improves lens shape for enhanced comfort. • Multi-curve lens architecture fits the eye anatomy precisely, reduces displacement and foreign body sensation; clinical satisfaction increased by 9%.
	Product Lifetime	Wound Care: • QuikNing Gauze features a five-year shelf life, exceeding the industry norm of three years through advanced manufacturing processes. Medical packaging: • Some product shelf lives extended from three to five years starting in 2024.



Aspect	Design Principle	Environmental Benefits
Use, Maintenance, End-of-Life	**Circular Economy**	Vision Care: • As part of the Green Action Initiative launched in China (since Sep 2022), over 130,000 used PP blister cups have been collected by end of 2024.  Medical packaging: • Maintained 90% reuse rate of wastewater from printing processes. • All factory waste converted into Solid Recovered Fuel (SRF) in 2024, reducing landfill waste by at least 200 metric tons. Skin Care: • Waste adhesive film from acne patch production repurposed into SRF; with 40 tons of waste film in 2024, an estimated 4.92 tCO_2e reduction was achieved.
Social Contribution	**Environmental Impact**	Skin Care: • Solvent-free manufacturing reduces Volatile Organic Compound (VOC) emissions versus traditional solvent-based adhesive processes. • Packaging light-weighting efforts—including material evaluation and structural optimization—reduce both physical volume and transportation-related carbon emissions. Vision Care: • Continued 100% recycling of polypropylene materials in 2024, reducing environmental impact through reuse. Wound Care: • Development of antimicrobial wound gel derived from natural polymers, offering lower carbon footprint due to renewable sourcing and enhanced biodegradability, helping mitigate environmental harm from medical waste.
	Social Impact	Wound Care: • Enhances home-based care, supporting elderly and disabled populations in improving quality of life. • Donated foam and hydrocolloid dressings to National Taiwan University Hospital Yunlin Branch for low-income patients, addressing healthcare equity in under-resourced regions. Vision Care: • Through the Vision of Hope Project, in partnership with Child Welfare League Foundation and Kobayashi Optical since 2014, Myoken has provided free prescription eyewear to over 2,600 economically disadvantaged children by the end of 2024. (See section 8-2-1 for details.) Medical packaging: • Sterile barrier systems help prevent hospital-acquired infections among healthcare workers and patients, supporting public health outcomes.

Waterproof and breathable textiles

Aspect	Design Principle	Environmental Benefits
Design	Structure optimization	• Advanced film microstructure design and optimized composite adhesive applications significantly enhance product performance and reliability. • e2cycle technology enables the recycling of PET from electronic waste into high-performance, eco-friendly textiles, showcasing Xpore's innovation in sustainable materials. This technology bridges environmental responsibility with functionality in technical apparel. The e2cycle mono-material polyester composite textile is scheduled for mass production in Q2 2025.
	Recyclable Materials	• Xpore is committed to sustainable textile innovation. The e2cycle product line utilizes recycled electronic polarizing film waste to manufacture high-performance textiles. • To reduce petrochemical dependency and support marine waste removal and purification initiatives, BenQ Materials combines its eco-friendly microporous membranes with ocean-recycled nylon yarns in domestic lamination facilities powered by renewable energy, launching waterproof and breathable fabrics using marine-recycled materials.
	Low-Impact Components	• Solvent-free lamination process emits no volatile organic compounds (VOCs), reducing environmental and health risks.
	Product safety	• Materials certified by Intertek to be free from PFOS and PFOA, aligning with global sustainable application trends. • The Xpore Ultra series features nano-scale waterproof-breathable membrane technology that passes the wet bacterial penetration resistance test (TTRIENISO 22610), supporting post-pandemic microbial barrier requirements.
Manufacture	High-Efficiency Manufacturing	• Introduction of automatic packaging machines increased packaging capacity by 50%. Replacing manual handling with conveyor belts reduced daily round-trip handling by 120 trips. • In 2024, improved production line speed boosted output by approximately 38% compared to 2023.
Logistics	Green Packaging	• Core pulp thickness of some shipping rolls reduced from 3 inches to 2 inches, allowing longer fabric rolls and better container volume efficiency, reducing shipment frequency. • In 2024, carton size reduced from 40 cm to 26 cm, significantly lowering paper consumption and reducing CO_2emissions by an estimated 1%.
	High-Performance Delivery	• Through communication with customers to optimize delivery schedules and consolidate shipments, pallet reuse was sustained. In 2024, the reuse rate reached approximately 60%.
Use, Maintenance, End-of-Life	High-Performance Products	• BenQ Materials' proprietary composite technology extends product life cycles, ensuring long-term reliability.
	Product Lifetime	• Xpore Ultra uses hydrophobic and breathable membranes, inherently more resistant to hydrolytic degradation than common polyurethane materials. • A new process developed in Q4 2024 is expected to increase product durability by 30%, with mass production planned for Q4 2025.
Social Contribution	Environmental Impact	• All Xpore products are 100% fluorine-free and non-toxic, prioritizing consumer safety. • All manufacturing processes strictly adhere to environmental regulations, ensuring no air or water pollution.



e2cycle: Innovative PET Recycling Technology Transforming Electronic Waste into High-Performance Textiles

According to the Global E-waste Monitor 2024, the volume of global electronic waste has reached 62 million metric tons and is projected to grow to 82 million metric tons by 2030. However, only 20% of this waste is properly recycled, with the remainder often causing severe environmental harm due to improper handling.

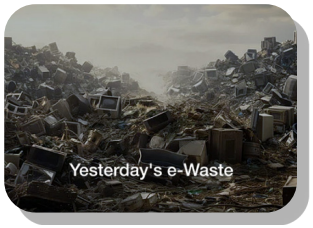
e2cycle: Pioneering a New Era of Sustainability through E-Waste

e2cycle technology recycles PET from electronic waste and converts it into high-performance, eco-friendly textiles—demonstrating Xpore's innovative capabilities in sustainable materials. This technology not only fulfills environmental responsibilities but also enhances functionality, enabling the development of high-value functional apparel and offering a comprehensive PET recycling solution that balances performance and sustainability.

The Urgent Challenge of Electronic Waste Collaborative Innovation for a Circular Future

The e2cycle PET recycling technology integrates BenQ Materials' expertise in electronics and material science with Far Eastern New Century's strength in textile manufacturing. This partnership transforms electronic waste into high-quality textile materials.

From polo shirts made with recycled PET sourced from electronic waste to waterproof functional jackets produced from discarded smartphone materials, e2cycle goes beyond traditional recycling approaches. It exemplifies the synergistic potential of the electronics and textile industries in advancing sustainable development.



Green Logistics

Green Logistics Policy

Achieving net-zero emissions is a global imperative for corporations. In addition to continuously optimizing manufacturing processes and improving water efficiency, BenQ Materials prioritizes low-carbon circular logistics management, placing low-carbon transportation and the reduction of emissions from logistics operations at the core of its logistics strategy.

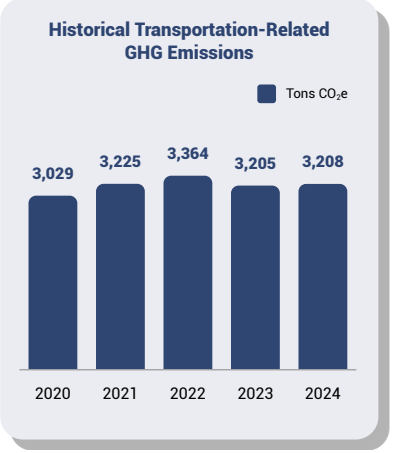
Recently, BenQ Materials has initiated product carbon footprint verification to gradually establish a product-level carbon emissions database. This database supports the development of low-carbon and energy-efficient products. Through low-carbon circular logistics practices, the company aims to realize its low-carbon manufacturing objectives.

Low-carbon Transportation	Product packaging material reduction	Packaging Material/Pallet Recycle
Planning for transportation optimization, implementation of combined type of transportation route, in order to reduce air freight weight, thereby achieving the goal of sustainable logistics and reduction of carbon emission.	Change the disposable cartons to recyclable packaging boxes for the shipping method, and increase the times of use of use of packahing material, in order to reduce generation of waste.	Use recyclable and reusable pallets for shipping, in order to prevent the use of disposable pallets, that may cause unnecessary wastes.

Low-Carbon Transportation

To reduce the carbon footprint associated with logistics operations, BenQ Materials revised its transportation strategy starting in 2023, gradually shifting from air freight to sea freight. In 2024, transportation-related greenhouse gas (GHG) emissions totaled 3,208 metric tons of CO_2e—representing a reduction of 156 metric tons of CO_2e compared to 2022, prior to the strategic adjustment.

Looking ahead, the company plans to further increase the share of low-carbon transport and adopt carbon intensity–based performance indicators to enhance logistics-related climate performance.



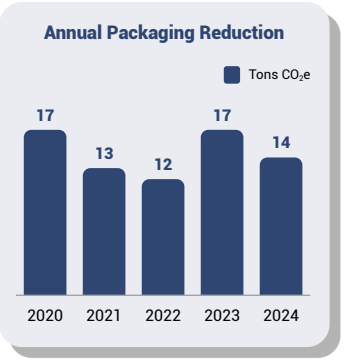
Note: Carbon reduction formula: Number of transports × [Carbon emissions per trip before implementation - Carbon emissions per trip after implementation]

Low-carbon packaging

BenQ Materials continues to implement policies such as "Recyclable Carton Box Verification," "Reduction of Outbound Shipment Frequency and Air Freight Usage," and the promotion of "Reusable Packaging Boxes" to encourage and lead customers in adopting sustainable packaging practices.

The company transitioned from single-use corrugated boxes to low-carbon packaging for outbound shipments. By applying design-for-reduction principles and using mono-materials, the packaging volume has been reduced and its environmental impact minimized through reuse.

In 2024, the polarizer production site's outbound shipment data showed that the adoption of recyclable packaging boxes significantly reduced the use of single-use packaging materials. The estimated reduction in packaging-related carbon emissions reached 3 metric tons of CO_2e, compared to 2023.



Note 1:Packaging Material Recycling Rate is calculated as the monthly volume of each type of recycled packaging material for polarizer products divided by the monthly outbound volume of the corresponding packaging material.
Note 2:The emission reduction coefficient for packaging boxes is based on data from Rong Cheng Paper Corp., indicating that the production of 1 kg of recycled cardboard using waste paper emits approximately 0.8 kg CO_2e.

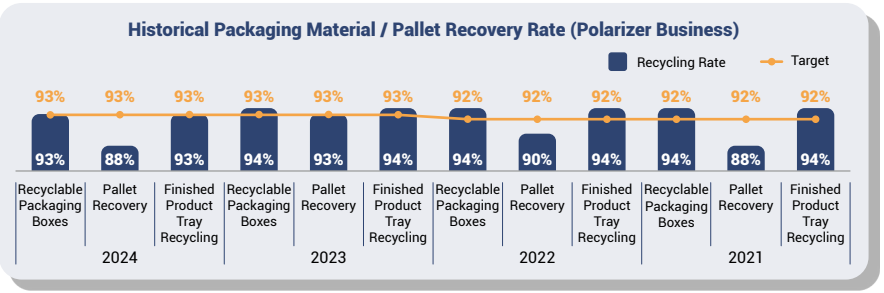
Low-Carbon Recycling Loop

The Display Materials Business adopts recyclable packaging materials and pallets for shipments, incorporating a low-carbon circular management system to track packaging material recovery volumes, recovery rates, and achievement levels. Through a packaging material recovery management mechanism, the company ensures recovery quality and extends the life cycle of packaging materials, thereby reducing material usage and cost, as well as minimizing waste generation.

In 2024, recovery performance included:

- Recyclable packaging boxes recovery rate: 93%
- Recycled pallets recovery rate: 88%
- Recycled product trays recovery rate: 93%
- Overall recovery rate: 91%, representing a 2% decrease compared to 2023.

BenQ Materials continues to monitor customers' recovery performance and arranges timely transport for recovered items to reduce the use of single-use packaging. The recovery rate target for 2025 is set at 93%.



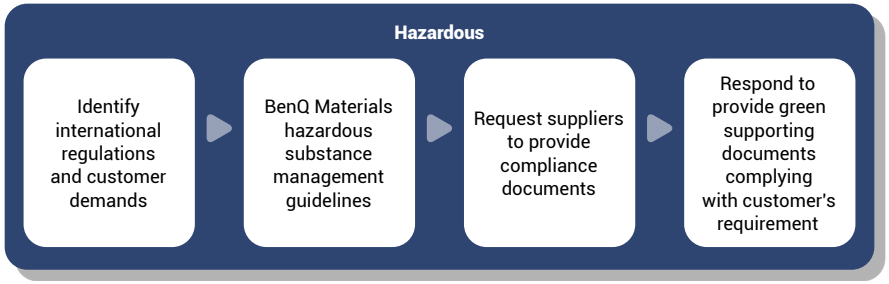
Hazardous Substance Management

Product Hazardous Substance Management

BenQ Materials established its GP Core Team in 2010 to proactively promote Hazardous Substance-Free (HSF) management. Each year, the company reviews its hazardous substance management practices based on international regulations, customer requirements, and environmental trends, and updates the "Environmental Quality Assurance Management System Operational Standard" accordingly.

All products must comply with international laws and customer requirements, including the EU Restriction of Hazardous Substances Directive (EU RoHS), the EU Registration, Evaluation, Authorisation and Restriction of Chemicals regulation (EU REACH), the Packaging and Packaging Waste Directive, and the EU Waste Electrical and Electronic Equipment Directive (WEEE).

A material hazardous substance management system has been established to ensure that the company's functional films and battery material products comply with all relevant international regulations and customer specifications. In 2024, a total of 391 product hazardous substance tests were conducted, achieving a 100% compliance rate.



Product Category	Number of Applications	Compliance Rate
Display Materials	324	100%
Specialty Products	41	100%
Battery Materials	6	100%
Biomedical Products	18	100%
Medical Packaging	2	100%
Total	391	100%

PFAS Reduction Plan

In light of the growing global concerns over the use of PFAS (Per- and Polyfluoroalkyl Substances) and increasing demands from many customers to prohibit the use of PFAS starting next year, the company has included relevant PFAS substances in its environmental management checklist and requires suppliers to control PFAS content to non-detectable (ND) levels.

To achieve the goal of completely phasing out PFAS, the company has launched the following reduction initiatives and plans to fully prohibit the use of PFAS in non-medical businesses by 2027:

Current State Assessment:

1. Continuously inventory all PFAS substances used in company products and processes, as well as their areas of application.
2. Establish a PFAS substance management database to facilitate subsequent monitoring and tracking.

Supply Chain Management:

1. Notify and require all suppliers to comply with the company's PFAS prohibition policy and provide relevant material testing reports.
2. Assist suppliers in researching and testing alternative materials to PFAS.

The phased implementation of PFAS reduction includes:

1. By 2025: Achieve complete substitution of high-risk PFAS substances, with PFAS test results in products reaching ND levels.
2. By 2027: Completely eliminate the use of all PFAS substances in products and processes.
3. Collaborate with the R&D department to assess and verify the feasibility and quality stability of alternative materials.
4. Conduct testing on alternative materials used by suppliers to ensure no additional environmental or health risks are introduced.

Customer Communication and Collaboration:

1. Product managers (PMs) or sales units proactively engage with customers to discuss alternative material solutions.
2. Continuously respond to customers' needs for PFAS reduction and substitution, assisting customers in complying with regulations and market trends.

Policy Review and Updates:

Annually review international regulatory trends, industry developments, and technological progress, and adjust the PFAS reduction roadmap and strategies accordingly.

Product Chemical Substance Management Achievements

1. Full Compliance with EU RoHS Directive:
   All BenQ Materials' products comply with the EU RoHS concentration limits for lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyls (PBB), and polybrominated diphenyl ethers (PBDE). In response to RoHS 2.0 regulatory requirements since 2016, phthalates (DEHP, BBP, DBP, DIBP) have also been included in testing, with results consistently showing "not detected."
2. Halogen-Free Requirements for Electronic Products:
   While general customer requirements specify individual bromine and chlorine content <900 ppm and total halogen content <1500 ppm, BenQ Materials enforces stricter limits of <800 ppm each for bromine and chlorine. All products meet these enhanced standards.
3. Disclosure of Hazardous Substance Listings:
   Under the EU REACH regulation and its Substances of Very High Concern (SVHC) list, BenQ Materials proactively investigates suppliers upon each SVHC update and discloses results transparently to customers.

In 2024, seven new substances were added to the SVHC list, bringing the total to 242. BenQ Materials conducted and disclosed results for 484 customer requests, covering 17 display materials customers, 1 specialty product customer, and 2 battery materials customers.

To align with EU regulations (e.g., RoHS and REACH) and customer standards (e.g., green product criteria, processes, and procurement), BenQ Materials enhances its compliance assurance through ISO 9001-based process and system management. To further reinforce quality assurance and customer confidence, the company successfully maintained QC080000 certifications at both the Taoyuan and Longtan plants in October 2024.

Chemical Management in the Supply Chain

BenQ Materials connects upstream suppliers—raw material providers, processing chemical suppliers, post-cutting plants, and shipping packaging suppliers—into an effective green product value chain. This collaborative framework ensures source-level control, enabling product compliance with green product standards while minimizing environmental impact during the manufacturing process.

Supplier Management Process:

BenQ Materials manages chemical-related disclosures via a Supplier Portal. Suppliers submit required documentation through the portal → internal approval is conducted → all files remain accessible in the system. Test reports provided by suppliers must be updated and re-uploaded annually.

foreword 0
BenQ Materials Introduction 1
Sustainability Governance 2
Responsible Governance 3
Responsible Product 4
Environmental Sustainability 5
Partnership 6
Friendly Workplace 7
Social participation 8
Appendix 9

Product Safety and Marketing Labels

Medical Device Standards and Certifications

All medical device products sold by BenQ Materials must obtain regulatory approval and certification from the respective countries prior to market entry. Certifications acquired include those from Taiwan (TFDA), the European Union (CE), the United States (FDA), and China (NMPA). Details of each country's product certifications are available on the BenQ Materials ESG website.

During clinical trials, products must comply with ISO 14971:2019, the standard for medical device risk management, and ISO 14155:2020, the guideline for clinical evaluation of medical devices. These standards govern risk management during product development and the scientific design, execution, documentation, and reporting of clinical trials to ensure reliable and valid results.

In addition, medical devices intended for direct human contact must pass biocompatibility testing under the ISO 10993 series before market release.

Medical Device Manufacturing and Sales Permits

BenQ Materials is a licensed medical device manufacturer, having obtained official approval and registration to produce related medical device products. These products comply with the safety and manufacturing standards of various countries, and the company holds all necessary manufacturing licenses.

For product sales, BenQ Materials must also acquire a medical device distribution license and complete product registration before any product can be legally marketed. Additionally, since contact lenses are classified as medical devices, they must be sold through physical retail channels that hold valid medical device distribution licenses before reaching end consumers.

Medical Device Product Labeling and Marketing Regulations

Transport Packaging Labeling Requirements

1 Outer Packaging:

Must be clear, easily identifiable, and permanent, including the following details:

- Product catalog number
- Quantity
- Manufacturer or supplier name/logo
- Production date in ISO 8601 format
- Batch/lot number
- Basis weight (grams per square meter)
- Roll width (cm) and length (m)
- Recommended storage conditions

2 Inner Packaging or Roll Labels:

Must be clearly visible and firmly attached, including:

- Quantity
- Manufacturer or supplier name/logo
- Batch number
- Basis weight (grams per square meter)

Medical Device Labeling Requirements

All BenQ Materials' medical device labels must comply with the local medical device regulations of each target sales market. In addition, labeling follows ISO 15223-1:2021, which provides standardized symbols for labeling and product information used in medical devices.

For products governed under Taiwan's Medical Devices Act, labels, instructions, or packaging must include:

- Product name
- License number or registration number
- Performance/intended use or indications
- Manufacturing date and expiration/shelf life
- Model/specification or key components
- Warnings, precautions, usage limitations, and foreseeable side effects
- Name and address of the license holder or registrant
- Name and address of the manufacturer
- Lot number or serial number
- Any other items announced by the central competent authority

Medical Device Marketing Requirements

Marketing of medical devices must strictly comply with the relevant advertising and marketing laws in each jurisdiction.

For example, in Taiwan:

- Pre-approval is required from competent authorities for any promotional materials, including text, graphics, or verbal content.
- Promotional practices are restricted: it is prohibited to advertise through impersonation, disguised publications, interviews, or other improper methods.

Taking contact lenses as an example (regulated as medical devices), all advertisements—whether print or digital—must comply with Taiwan FDA advertising review guidelines. The Ministry of Health and Welfare regularly communicates updated rules and review principles to ensure proper implementation.

For influencer collaborations, BenQ Materials requires all branded product review content to be pre-screened by the regulatory affairs department to ensure compliance with advertising laws.