



Stewardship Report



**GUARDIAN®
GLASS**

See what's possible™

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A Message from our Leadership Team

Guardian Glass helps people improve their lives through innovative products that provide daylight, security, energy efficiency and comfort. From the facade of today's most exciting new office towers around the globe to the shower enclosure in your bathroom, our products are the result of thousands of team members pursuing innovation.

We are focused on our vision to be the preferred global supplier of architectural glass solutions.

All efforts to achieve this vision are executed under the guidance of our stewardship framework, which focuses on:

Responsible management of our business and the resources entrusted to us in a manner that respects the rights of others.

We work to efficiently use our resources while operating in a way that protects the safety, health and well-being of our employees, the environment and the community. Our talented team members apply

Principled Entrepreneurship™, experimentation and experimental discovery, and innovation to continuously improve and transform, inspired by our culture, Principle Based Management™.

Their perspective ensures we are plugged in to the speed at which the world is changing. And their drive to challenge the status quo, work together with partners to gain insights and turn that insight into innovative and superior products and solutions for our customers is why we will continue to be successful. Our employees are our most valuable asset and the heart and soul behind our stewardship efforts, which are on display in these pages and at our facilities worldwide.

We invite you to learn more about our team and their efforts in this report.

— GUARDIAN LEADERSHIP TEAM

Who We Are

Guardian Industries is comprised of two distinct businesses, Guardian Glass and SRG Global. We are a wholly owned subsidiary of Koch Industries, a privately held entity. Koch companies have a presence in about 60 countries and employ more than 120,000 people worldwide.

Headquartered in Auburn Hills, Michigan, United States, Guardian Industries has worked with glass since 1932, beginning as a small windshield fabricator, and has made float glass since 1970, when production started at its first float glass facility in Carleton, Michigan, United States.

Today, we are one of the largest float glass producers in the world, with operational control of 23 float glass lines across five continents.

Guardian Glass (Guardian) employs over 6,700 people. Our employees are located in more than 30 countries and serve over 160 countries.

We work closely with clients and partners at a global, regional and local level to apply glass innovation across a diverse range of projects, manufacturing high-performance float, coated, laminated and fabricated glass products for architectural, residential, interior, transportation, solar and technical glass applications.

Guardian identifies opportunities to build on glass performance benefits, expertly combining glass types to maximize energy savings while bringing light and comfort to people's lives.

[Learn more about our story](#) 



- ★ 1 Worldwide Headquarters
- 3 Regional Headquarters
- 23 Operationally controlled float glass lines
- 1 Non-operationally controlled float glass line
- 3 Glass fabrication plants
- 1 Glass Technology & Development Site

Globally we can produce
500
km of float glass a day.*

*Based on 4 mm thickness float glass

Float Glass Manufacturing


Float glass production involves mixing and heating raw materials, including sand, soda ash, dolomite, limestone and cullet, in furnaces at temperatures of approximately 2,900°F, or about 1,600°C, to a liquid state and then floating the subsequent ribbon of glass atop a bath of molten tin.

The typical life span of a float glass manufacturing furnace is 16-20 years. When a furnace comes to the end of its useful life, it can be rebuilt from the ground up in what is known as a Cold Tank Repair (CTR). Outside of the CTR, it is challenging to make major modifications to the furnace. While a furnace is active, we continue to focus on innovation throughout the process related to automation and responsible management of resources.

LEARN MORE

[Training Center](#) ↗

[Workshops & E-training](#) ↗



Did you know?
The continuous glass ribbon is pulled from the furnace 24/7, 365 days a year!



Our Stewardship Vision



Our Stewardship Vision

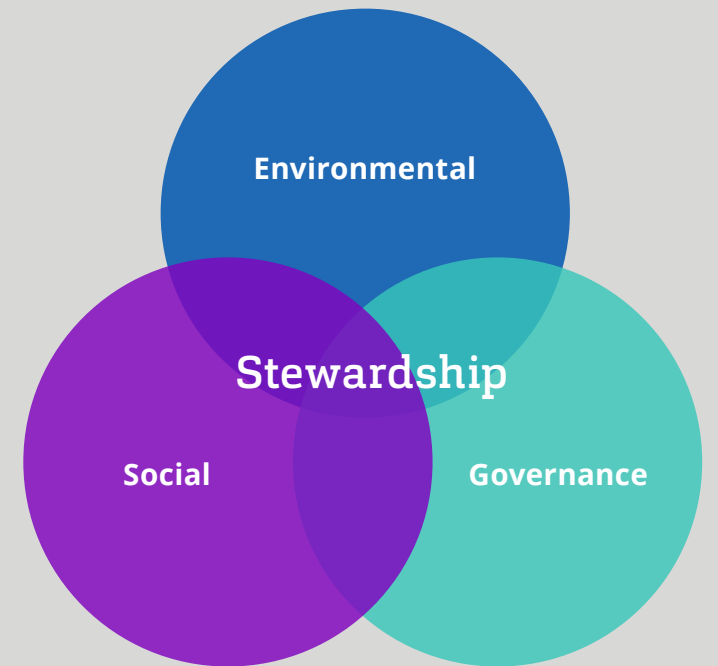
We prioritize stewardship throughout daily operations.

At Guardian, our Vision is to help people improve their lives by providing the **products and services** they value more highly than their alternatives. We do this **responsibly**, while **consuming fewer resources**; seeking mutually beneficial outcomes with customers, employees, suppliers, communities and other key constituencies.

Our stewardship framework flows directly from this Vision, describing our commitment and priorities around Environmental, Social and Governance (ESG) topics. Stewardship broadly encompasses the responsible management of our actions and the resources entrusted to our care in a manner that respects the rights of others.

LEARN MORE

[Stewardship Framework](#) 





Focused on Mutual Benefit

We work to continuously understand changing market drivers and regulatory requirements. Each step of the way, our team collaborates with customers, employees, suppliers, regulators and communities to create greater long-term value for everyone involved.

"In our changing world, the need for a safe, comfortable living space with natural light will always be constant. Glass is fundamental in meeting this need. Principle Based Management™ guides us to embrace the opportunities that come with rapid change, continually transforming to develop the next generation of high-performance glass products and high-value glass services. We do all of this within the guidance of our stewardship framework."

— Guus Boekhoudt

*Executive Vice President, Europe, Asia Pacific (APAC),
Africa Middle East (AME) and India, Guardian Glass*





Principle-Based Approach

Principle Based Management™ is the **business philosophy and framework** we apply to innovate, improve and transform ourselves and our businesses to create greater value.

Our Values are derived from principles of human progress and define who we are as an organization. This serves as a North Star to guide our longstanding commitment to stewardship in compliance with all laws and regulations, while respecting the rights of others, especially regarding safety and the environment.

LEARN MORE

[Our Values](#) ↑

[Principle Based Management™](#) ↑



Bottom-Up Solutions

We focus on empowering individuals to improve their lives and communities through bottom-up solutions rather than top-down imperatives. A bottom-up approach is about unleashing the creativity and problem-solving abilities of every individual, resulting in beneficial outcomes beyond what anyone could have planned or predicted.

Principled Entrepreneurship™

A key aspect to our transformation efforts is a commitment to constantly innovate and find better ways of working. We cannot create superior value for our customers, company, employees and society unless we develop new visions, strategies, methods and products. To Guardian, it means accepting the customer's challenges to advance our product portfolio and process capabilities, including disruptive technologies, while remaining committed to our stewardship vision. What keeps the pipeline fresh and dynamic is the knowledge, expertise and insights of our people. They are the source of our growing momentum to provide more innovative solutions each day.





Bringing Our Vision to Life

We use a balanced and informed approach to optimize outcomes in a constantly changing landscape. For each opportunity, we consider factors such as current and evolving capabilities, regulatory standards, customer expectations, safety, environmental performance and financial feasibility to help us make the right decisions consistent with our business and stewardship visions.

GLASS RECYCLING

Using cullet — broken or scrap glass — to produce float glass can help reduce energy consumption, thereby lowering CO₂ emissions and contributing to responsible resource management. Guardian continues to explore options for expanding the use of cullet in its operations; as well as seeking partners in the advancements in the methods of recovering and recycling glass, particularly from architectural structures.

ASSET UPGRADES

In 2023, Guardian installed cutting-edge furnace technology at our Bascharage, Luxembourg, facility, which is estimated to consume ~25% less natural gas, emit ~15% less carbon dioxide (CO₂) and decrease the generation of nitrogen oxides (NO_x) compared to traditional float glass furnace technology. Exemplifying application of our stewardship framework through innovation, we invested in the latest technology to service our customers with the very best products in the most effective and efficient way by taking into consideration factors such as location, the energy grid system, anticipated performance and environmental benefits.





Governance



A Network of Accountability

At Guardian, integrity, compliance and responsibility at all levels of the organization are highlighted in our Principle Based Management™ philosophy and robust Code of Conduct. Our management philosophy strongly supports fair and honest competition and open markets, as highlighted in Our Values.

We have strict processes aimed at compliance with all applicable laws wherever we operate. This includes laws pertaining to anti-corruption, anti-bribery, freedom of association, wages and work hours, privacy, the prohibition of forced and child labor and unlawful employment discrimination. We also take steps to ensure that the products we receive from our suppliers are responsibly manufactured and sourced.

We openly communicate with customers, employees and other constituents about stewardship-related performance. Audit and self-assessment results, incident tracking, investigations and knowledge sharing are some of the tools used to learn and improve performance across Guardian. A formal and independent Compliance and Ethics Committee report is provided to the Guardian Glass board of managers on a routine basis. Our shareholder, Koch Industries, also consistently reinvests a significant portion of group earnings — a practice that funds the exploration, innovation and opportunities that help us create ever-greater benefits for all.

We value stakeholder feedback. Our Koch GuideLine enables employees, customers, suppliers and others to register a concern online or via telephone. This is staffed by an independent company 24 hours a day, seven days a week. Calls are free and can be made anonymously when permitted by local law. The posted information is directed to the Compliance and Ethics team, which appropriately follows up with and addresses all concerns raised.

LEARN MORE

[Code of Conduct](#) ↑

[Koch GuideLine](#) ↑



Empowering Employees

All Guardian employees and leaders — including executives and management — are expected to embrace and demonstrate our company culture, as described in Our Values. We provide targeted, risk-based training globally to help every team member make good decisions. The trainings cover topics such as anti-corruption, anti-money laundering, antitrust, cybersecurity, respectful workplace and workplace violence prevention, and environmental health and safety, among others.





Respecting the Rights of Others

We are advocates for principles of human progress. These are principles that have been proven over time to promote peace, civility, opportunity and fulfillment. Our company's approach is to remove barriers to opportunity by continuing to incorporate these principles into our businesses.

As noted in our Code of Conduct, we are committed to adhering to applicable employment and labor laws everywhere we operate. This includes observing those laws that pertain to child labor, forced labor, human trafficking, wages and work hours, security forces and freedom of association. Our minimum age for employment is 18 years of age.

LEARN MORE

[Principles of Human Progress](#) 

[California Supply Chains Act](#) 

[UK Modern Slavery Act
Transparency Statement](#) 





LEARN MORE

[Supplier Portal](#) ↗

[Responsible Sourcing](#) ↗

Supplier Expectations and Responsible Sourcing

We strive to focus our business on preferred partnerships with suppliers that align with the expectations outlined in our Code of Conduct, Our Values and stewardship framework. To do this, our suppliers must meet a series of criteria, linked to our management principles, which are specifically referenced and communicated in our supplier contracts.

Suppliers and subcontractors of goods and services must complete an onboarding process to assess compliance with applicable laws and regulations.

Guardian maintains a supplier portal, where suppliers can easily access information related to the Guardian-supplier partnership, such as Quality Manuals, Purchase Terms and Contractor Expectations documentation.

Our commitment to responsible resourcing extends to topics such as raw materials; conflict minerals; counterfeit parts; reuse and recycling; energy; biodiversity; land use and deforestation; soil quality; animal welfare and land, forest and water rights; and forced eviction, where applicable.



Environmental Stewardship



At Guardian, each of us are responsible for creating bottom-up solutions that further our stewardship vision and environmental priorities. We work to improve each stage of the product life cycle, from sourcing raw materials to end of life.

To achieve these solutions, we build mutually beneficial, long-term partnerships with customers, employees, suppliers, communities and other key constituencies. Our team members are encouraged to experiment with new processes, technologies and products to continuously innovate and transform the way we do business.

CORE INNOVATION CATEGORIES:

FLOAT GLASS PRODUCTION

Increase the energy efficiency of equipment and assets; reduce air emissions and water consumption; and responsibly manage materials.

[See details](#)

PRODUCT PERFORMANCE

Design products that provide better access to quality views, daylight, safety, advanced energy performance and other benefits where people live, play, learn and work.

[See details](#)

PRODUCT TRANSPARENCY

Openly communicate the efficiencies and attributes associated with our products and their compliance with regulatory and voluntary material health and safety standards.

[See details](#)

"Stewardship is not new to Guardian. It is a core part of our company's management framework, Principle Based Management™. It is crucial that everyone who works at Guardian is invested in stewardship — we must each use our best knowledge and know-how to innovate and find new ways to operate in a responsible way. Each of us has a responsibility to stewardship, which helps us focus on creating the most value for our customers and society."

— Kate Krezowski

ESG Stewardship Manager, Guardian Industries



Float Glass Production

As a founding member of Glass Futures™, we are investing in a new pilot facility in the United Kingdom, the Global Centre of Excellence for glass in research & design. Glass Futures focuses on innovation and training that will help define future technologies in the float and global glass manufacturing industry.

GLASS FUTURES PROJECTS OF INTEREST:

- Development of alternative fuel technologies
- Heat recovery, abatement and Carbon Capture, Utilization and Storage (CCUS) demonstrations
- Secondary raw materials for recycling
- Raw material and cullet processing technology
- New compositions and treatments
- Next generation refractories

Read about [Rapid and Dynamic Electric Boosting of Glass Furnaces](#) for an example of Guardian's contributions to Glass Futures projects and broader industry advancements.



FLOAT GLASS PRODUCTION

Process Transformation

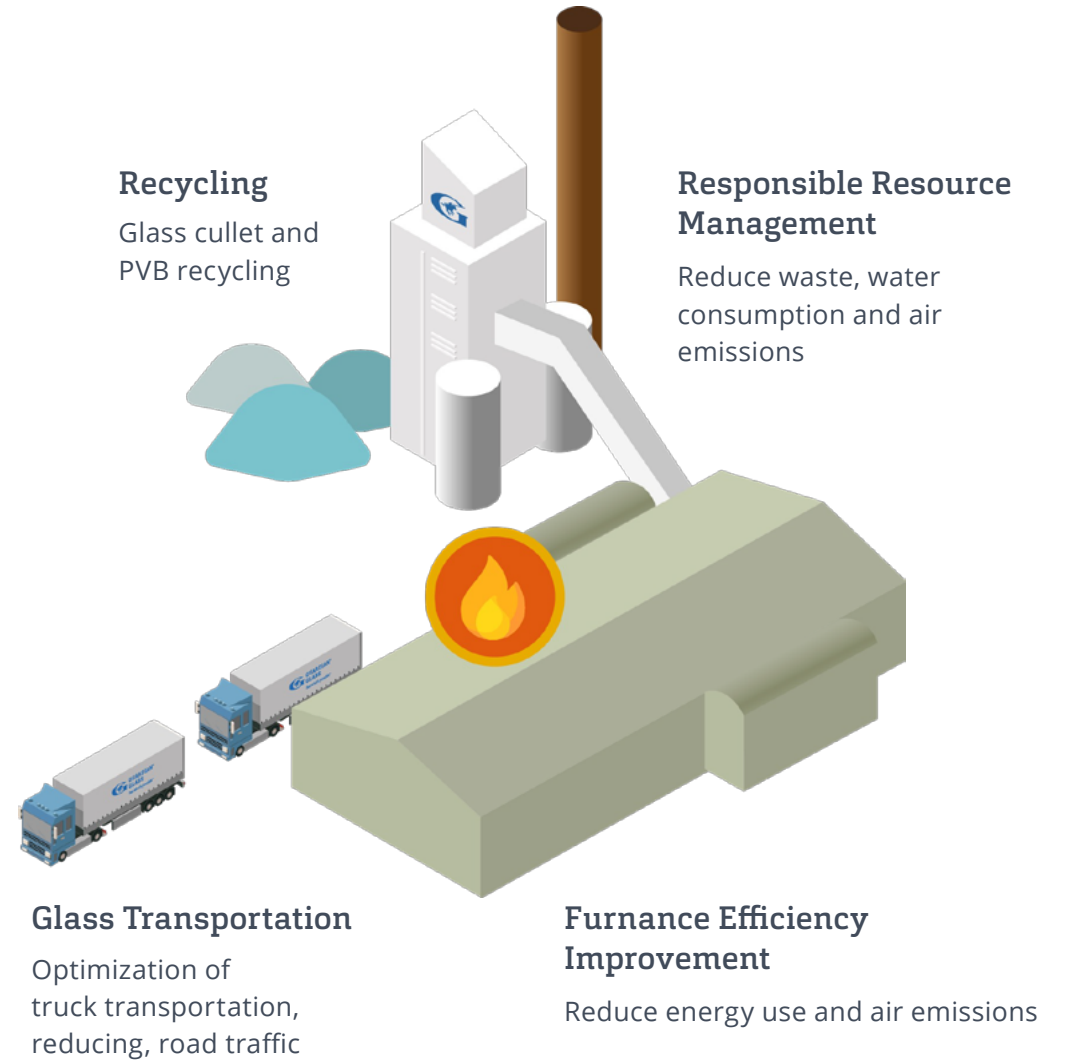
Enhancing process operations can help minimize risks and maximize efficiencies.

We actively look for ways to implement operating sensors and other monitoring systems to connect the decision analytics team with information from the manufacturing line. The data is used to make improvements and enable employees to make informed decisions.

The solutions we develop are often influenced by a variety of factors, including intensifying regulatory requirements, evolving customer needs, availability of existing and alternative raw materials, and financial feasibility. But the shared Vision and management philosophy remain the same — we focus on using fewer resources to create products that people value.

View examples of environmental stewardship in action across our float glass production processes by region.

- U.S.
- LATAM
- EU
- AME
- APAC





>90%
REDUCED SO₂
INJECTION
AMOUNTS

MANAGING RESOURCES RESPONSIBLY

- Our site in Richburg, South Carolina, completed several comparison projects to evaluate the efficient use of sulfur dioxide (SO₂) in the production process. SO₂ is injected on glass to reduce scratching and damage by the rollers as it passes through the float line. By decreasing the SO₂ dispensed over time, and checking for maintained quality parameters, the site has **reduced SO₂ injection amounts by more than 90%** (standard cubic feet per hour).



CONSERVING WATER

- In 2023, our site in Corsicana, Texas, installed flow meters on the cooling towers and coating line washers. The flow meters are commissioned to a software that allow for real-time monitoring of water usage. In the event there is excess water usage due to a leak, stuck valve or inefficient processes, the site engineers can efficiently identify these issues and promptly resolve them.

65%
REDUCED NO_x
EMISSIONS

REDUCING EMISSIONS

- Our site in Geneva, New York, initiated a combustion-efficiency project in 2022 to reduce nitrogen oxides (NO_x) generated from the site's furnace by optimizing emission control system (ECS) reactor dosing. As a result, **NO_x emissions and the required ammonia dosing have reduced by about 33%**.
- Our sites across the United States have been equipped with various Emission Control Systems (ECS) during the past 15 years to help meet regulatory requirements. **These technologies have reduced NO_x emissions per unit of glass by over 65% across the region.**

550,000
KWH ENERGY
SAVINGS

SAVING ENERGY

- In 2019, our site in Kingsburg, California, implemented an automatic function in the coater process, which ramps down power supply kilowatts and gas flow setpoints during periods of coater inactivity. It significantly reduces the number of materials used during times of coater inactivity, extending the target lifespan by about 158 days per year. There are also significant energy savings of approximately 10.6 kWh for every minute it is active. This totals to about 640 kWh per hour! **Since implementation, the technology has contributed to 550,000 kWh in energy savings, which is enough energy to continuously power over 1,000 60-watt lightbulbs for a year.**

**>1.3MM**M³ OF WATER SAVINGS**CONSERVING WATER**

- In 2014, a drought adversely impacted communities at our Tatuí and Porto Real locations in Brazil. Employees at our site in Tatuí designed a wastewater treatment system to recover effluent from the wet coater for reuse. Additionally, the team found a way to reuse the reject water from the system's reverse osmosis (RO) treatment process, rather than sending the water to be treated. The site has now applied these water conservation practices to other areas of the facility, accumulatively reaching **more than 1,300,000 m³ of water savings since 2014. This is equivalent to more than 2.7 billion 16 oz water bottles.**

>1%

REDUCED FUEL CONSUMPTION

SAVING ENERGY

- Our sites in Porto Real and Tatuí, Brazil, installed Expert System, a monitoring program that automates data collection from furnace thermal couples and calculates the amount of fuel going into the furnace. It helps regulate and stabilize furnace temperature control. With this technology, the sites have **reduced fuel consumption by more than 1%**, a sizable reduction for float glass manufacturing. Other Guardian Glass sites have also installed the Expert System.

60%REDUCED SO_x**REDUCING EMISSIONS**

- Through asset upgrades and various forms of primary control methods (e.g., airflow, burner adjustments), our sites at Tatuí, Brazil, and El Marqués, Mexico, have achieved **nitrogen oxides (NO_x) emission reductions of approximately 15-20% and 25%**, respectively. Our site in Porto Real, Brazil, installed two Emission Control Systems (ECS) in 2018, which typically achieve a **60% reduction in sulfur oxides (SO_x) and particulate.**
- Glass products manufactured using a wet coating process requires the use of coating materials and solvents that contain volatile organic compounds (VOCs). Driven by regulatory limits, our site in Tatuí, Brazil, implemented a number of improvements to the process and materials used to reduce the VOC quantity and emissions from the wet coater operations. This included substituting the paint for one with a lower solvent content, controlling the glass temperature prior to paint application (improves curing of paint to glass in the oven) and installing curtains in the first zones of the curing oven. As a result of these improvements, the site **reduced wet coating VOC process emissions by more than 90%.**

>90%

REDUCED EMISSIONS



3,319

TONS OF PVB RECYCLED

MANAGING RESOURCES RESPONSIBLY

- Lamination lines from six of our manufacturing sites in Europe recycle the polyvinyl butyral (PVB) trims for reintroduction in our supplier’s PVB manufacturing processes. On average, approximately 72 tons of PVB are recycled per plant, per year. Between 2017 and 2023, **around 3,319 tons of PVB have been recycled.** Suppliers’ recycling of PVB trims is dependent upon the quality of the material.

50%

REDUCED EP DUST LANDFILLED

- Flue gas, containing dust particles, is generated in a glass furnace during the melting of raw materials. Guardian has invested in electrostatic precipitator technology, a closed-loop filterless system that precipitates those fine particles into a dust (i.e., electrostatic precipitator dust, or EP Dust) that can be reused as a raw material in our float process. Through reintroduction of the precipitated EP Dust in the furnace, our sites in Europe have been able to reduce the demand for certain raw materials and also **minimize the amount of EP Dust landfilled by about 50%.**

13%

INCREASED TRUCK CAPACITY

OPTIMIZING TRANSPORTATION

- Between 2018 and 2023, our sites across Europe have increased the **amount of glass tons transported in each truck by 13%** (an increase of about 3 tons per truck), reducing the number of trucks necessary to transport our product and the associated vehicle emissions.

10%

POWER NEEDS GENERATED

SAVING ENERGY

- Our site in Bascharage, Luxembourg, is installing solar technology in 2024 that is **expected to generate about 10% of the site’s power needs.**

>65%

REDUCED NO_x EMISSIONS

REDUCING EMISSIONS

- Our manufacturing sites across Europe have been equipped with various Emission Control Systems (ECS) during the past 15 years. **These technologies have continued to reduce nitrogen oxide (NO_x) emissions per unit of glass by over 65% across the region.**



MANAGING RESOURCES RESPONSIBLY

- Since 2016, our site in Ras Al Khaimah (RAK), United Arab Emirates, has reduced wood packaging needs by increasing open glass shipments from 30% to 70%. The site was able to reduce wood packaging imports and associated cradle-to-gate CO₂ emissions (e.g., minimizing the number of trees cut down, wood processed, wood transported to port, wood shipped to the Middle East region, wood shipped to our site), and **reduce waste generation, such as wood and packing materials, by 30%**. In addition, this improves the ease and safety in handling, packaging and unpacking time, and increases flexibility for the labor force of Guardian and our customers.
- In 2023, our site in Al Jubail, Saudi Arabia, underwent a cold tank repair (CTR), during which the furnace was rebuilt to accommodate a wide glass ribbon format, contributing to less glass trim waste per square meter of glass produced. The float line is fully automated, improving efficiency and allowing employees to focus on other higher-value tasks they find fulfilling.



EARNING RECOGNITION

- In 2022, for the fifth year in a row, our site in Al Jubail, Saudi Arabia, was recognized for environmental excellence by the Royal Commission. The achievement is based on competency and skills, compliance with regulations and environmental programs, and initiatives to identify and minimize environmental effects.



REDUCING EMISSIONS

- In 2018, Guardian became the first glass manufacturer in Egypt to install an Emissions Control System (ECS) for emissions such as nitrogen oxides (NO_x), sulfur oxides (SO_x) and particulate matter. The system installed at our site in Cairo, Egypt, has **reduced furnace NO_x emissions by over 70%**. Similarly, our site in Al Jubail, Saudi Arabia, installed an ECS on the wet coater and the glass furnace during their 2023 CTR, which typically **reduce NO_x emissions by approximately 70%**.



SAVING ENERGY

- Our site in Cairo, Egypt, achieved an **annual energy savings of 313,000 kWh** by replacing old High-Pressure Sodium Vapor (HPSV) warehouse roof lighting with energy-efficient LED fixtures and removing panels from the front windows to allow more daylight.



95%
REDUCED
PAPER USAGE

MANAGING RESOURCES RESPONSIBLY

- In 2023, our site in Rayong, Thailand, implemented an automated, digital system for tracking and recording operational and quality-related data on the main float line. This nearly eliminated the need for handwritten and printed data tracking and enhanced our ability to promptly detect and respond to defects. **Paper usage was reduced by about 95% at the main float line.**



- Through the collaboration of Guardian strategic sourcing and procurement teams and local suppliers, our site in Nong Khae, Thailand, has onboarded new suppliers for raw materials such as soda ash, creating mutually beneficial relationships that have **shortened material transit times as well as associated road emissions.**

55%
REDUCED
ENERGY USE

SAVING ENERGY

- Our sites in Nong Khae and Rayong, Thailand, have made a concerted effort to implement several energy-efficiency initiatives. For example, both sites have replaced a total of 630 warehouse roof lamps with high-efficiency LED fixtures. The new LED fixtures have **reduced energy use for lighting by approximately 55% at each site, totaling over 1,200,000 kWh in annual energy savings** for both locations. Both sites have also installed variable-frequency drives to the control fan speed on the glass cooling fans, **reducing the energy required to operate the fans by more than 35%.**



ACHIEVING INDUSTRY CERTIFICATIONS

- Our site in Nong Khae, Thailand, has **maintained Level 2 Green Industry certification since 2020.** Green Industry certification is awarded by the Thai Ministry of Industry to companies that commit to an environmental program focused on continuous improvement in production processes and environmental management.



Product Performance

The Guardian product portfolio is a reflection of our stewardship vision in action. We enable customers to reduce the impact of the built environment to create value for society.

We produce a variety of high-performance, energy-efficient glass products for commercial, residential, interior, transportation, solar and specialty applications.

These products can be found on iconic architectural projects, such as the Burj Kalifa to the near-invisible museum glass protecting the “Mona Lisa,” to the windows, mirrors and shower glass in your residential home.





PRODUCT PERFORMANCE

Glass Technology and Development

Bringing together science, manufacturing and customer needs to achieve true glass innovation consistent with our stewardship framework takes a specialized and dedicated team.

Our efforts around glass technology and development include talented employees with deep knowledge in product and process development that have an incredible track record in the invention of float glass formulations, coatings, manufacturing techniques and other breakthrough technologies. The Guardian Glass Technology and Development (GTD) site, located in Carleton Michigan, United States, houses a full-size vacuum coater to accelerate new product design and development.

More than 500 patents have been filed by Guardian since the founding of GTD in 2000.





PRODUCT PERFORMANCE

High-Performance Glass

Our high-performance coated glass, also known as low-emissivity (low-E) coated glass, is designed to meet the toughest architectural and aesthetic challenges while leading to energy savings when installed in buildings. According to the U.S. Department of Energy¹, **high-performance glass can reduce energy losses by 30-50%**, contributing to the reduction of operational carbon emissions and helping architects and designers meet energy code requirements and achieve building certifications.



Guardian NEXA™ 6

Guardian Nexa™ glass is the first of our lower-carbon glass products. It is made for a variety of building facade applications and can contribute to the reduction of embodied carbon in the built environment.

Through research and development, technical innovation and manufacturing expertise, Guardian Nexa™ 6 is expected to have an embodied carbon of 6.38 kg CO₂e / m² when compared to our standard 4 mm float glass.²

LEARN MORE

[High-Performance Glass](#) ↑
[Guardian Nexa in Europe](#) ↑



PRODUCT PERFORMANCE

Bird-Friendly Glass

Every year, millions of birds migrate through populated areas with large buildings. To help these birds avoid accidental collisions with windows, Guardian developed the Guardian Bird1st™ family of products in Europe and North America.

Tested by bird conservationists for proven effectiveness, Guardian's bird-friendly solutions pair with SunGuard™ coatings to help meet project energy performance requirements and support LEED® Innovation Credit³ for Bird Collision Deterrence qualification.

LEARN MORE

[Bird-Friendly Quiz](#) ↗

["Building Better for Birds" E-book](#) ↗



"One example of how our employees unleash creativity and problem-solving abilities is the Guardian Glass Technology & Development team's conception of our award-winning Bird1st™ family of products, an illustration of how we prioritize the environment."

— **Rick Zoulek**

Executive Vice President, Americas



Product Transparency

Guardian supports designers and architects who strive to enhance building performance profiles through the products they specify. To do this, Guardian offers several certifications, declarations and other documents that communicate information about the performance of our glass products across their life cycle. **Guardian products support global Green Building Certifications**, such as the Leadership in Energy and Environmental Design (LEED) rating system, Building Research Establishment Environmental Assessment Methodology (BREEAM), and WELL Building Standard. **Guardian is also proud to offer our LEED® Green Associates™, in association with Green Building Certificate Inc (GBCI), as expert support to help customers meet specific LEED® requirements.**



PRODUCT TRANSPARENCY

Environmental Product Declarations (EPD)

- Guardian offers third-party verified EPDs based on third-party verified Life Cycle Assessments (LCAs) specific to our glass facilities in Europe, NA, AME&I and SA regions.
- The embodied carbon feature is included in the performance calculator.

Voluntary Safety Data Sheet (SDS)

- Guardian conveniently provides voluntary data on our float glass, including uncoated float, vacuum (sputter) coated, laminated and mirror products to our customers via article SDS, which include information related to product composition, health and safety considerations, and product declarations.

International Organization for Standardization (ISO)

- Select Guardian sites are certified to ISO 14001.

Cradle to Cradle (C2C)

- Guardian obtained the C2C Bronze level Certification version 3.1 and met some of the more stringent requirements of C2C Bronze level version 4.0 for three of our European product families — coated glass, laminated and float glass products.

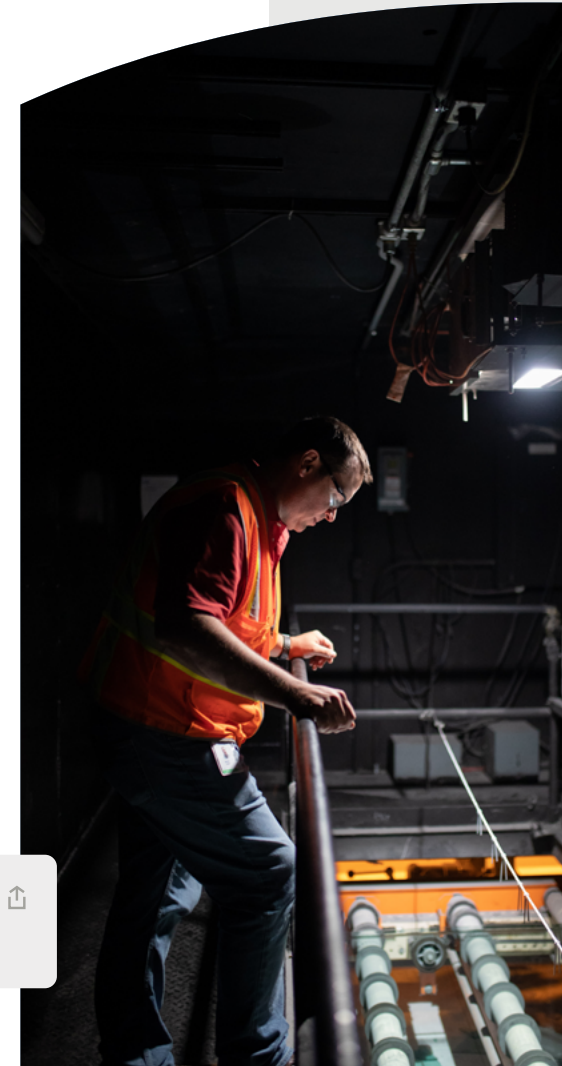
Health Product Declarations (HPD)

- In alignment with our commitment to product transparency, Guardian has developed and voluntarily published global HPDs for three of our main product categories: uncoated float, vacuum (sputter) coated and UltraMirror™ glass.

LEARN MORE

[Resource Library](#) ↑

[LEED® E-book](#) ↑





Social Stewardship



Health and Safety

The health and well-being of our employees and communities are always our top priorities. We build capability in our employees and resilience in our systems to prevent serious outcomes when the unexpected happens.

We promote a principle-based, bottom-up approach to safety, involving front-line employees and supervisors in the identification of potential hazards and implementation of solutions across our global footprint. Each person is expected to raise concerns and share ideas about opportunities for improvement. Each manufacturing site has completed a risk evaluation that includes priorities with a focus on potential critical hazards. Action plans are developed and knowledge networks are leveraged across the organization to better manage risk in those areas.

Guardian monitors multiple indicators of progress, including leading and lagging indicators. Consistent with our safety vision, Guardian continues to partner with employees and contractors to mitigate risks and avoid injuries.





EVERY DAY IS SAFETY DAY

Our safety vision is applied throughout the organization and brought to life through global and site-specific health and safety initiatives. For example:

- Our **global initiative**, “Control of Hazardous Energies,” focuses on teaching our employees to recognize hazards in the workplace and encourages them to report and address risks, while prioritizing elimination and mitigation of critical risks. We believe this to be the best way to create a safer work environment, where employees are respected and empowered to drive innovation and transformation.
- In **El Marqués, Mexico**, the wet coater has fully commissioned automatic chemical handling consoles. This avoids manual handling and preparations of chemicals and solutions on the mirror line. It is a transformational change in managing the risks of handling chemicals.
- In **Tudela, Spain**, a thermal stress study, supported by health care professionals, teaches our furnace workers to recognize the early signs of fatigue in this hot and challenging work environment, encouraging them to take breaks when they feel the need, instead of at set times.
- Our site in **Cairo, Egypt**, hosted an event for “World Safety Day,” which was not just a celebration of safety and our priorities, but strived to increase our employees’ knowledge and enhance their participation in eliminating, managing or mitigating health and safety risks.





Employee Experience

A supervisor's primary role is to help employees develop and maximize their contributions by applying Principle Based Management™. We place great emphasis on coaching and mentoring to help our people thrive.

Employees are expected to engage in a 360-degree feedback process at least annually to encourage and further develop a contribution mindset.

We also seek out and value their knowledge and ideas, remove barriers to participation and encourage role changes to realize potential.

We reward employees for their contribution to the long-term success of Guardian consistent with Our Values and we continually look for mutually beneficial outcomes by providing employees with benefit choices aligned with their values and personal situations. We comply with applicable minimum wage requirements.

Our commitment to individual growth and well-being is also exemplified by our Global Employee Assistance Program — available to all our employees and their families at no cost. Through this program, employees are offered professional and confidential health counseling, with additional resources to help employees manage their lives outside of work.

"We seek team members who have a talent that will help the business, are committed to our framework and want to participate. Contribution-motivated employees seek growth and challenge and help others succeed. We are committed to giving our people the tools they need to be successful professionally and personally. When we care about ourselves and each other, we're able to show up to work as the best version of ourselves."

— Kristin Thoen

*Vice President, Human Resources,
Guardian Industries*





Inclusion and Diversity

Guardian is a global organization, connecting individuals of many diverse backgrounds, skill sets and perspectives across five continents to work toward a unified vision of providing products valued by society in a way that is consistent with our principles and values.

Our Values set an expectation to treat every person with dignity and respect, encourage and foster networking, and sponsor activities that are inclusive and focus on shared interests. We celebrate the uniqueness of each individual. Characteristics such as heritage, gender and many others often inform an individual's experiences and perspectives and can help them create value. We believe that no single characteristic should be used to define another person. Every employee is unique and has the opportunity to be included and find work that aligns with their individual gifts and passions.

At Guardian, we believe in people and invest in our workforce and our surrounding communities. We focus on an individual's skills, seeking candidates from a wide variety of sources by removing barriers to employment, including the removal of prerequisites, such as high school diplomas or general education diploma (GED) equivalents for numerous roles. Guardian also supports second chance hiring⁴ by banning the box⁵ that required individuals to acknowledge prior convictions on their applications. Second chance hiring helps break the cycle of incarceration by giving people an opportunity to reenter the workforce and contribute to society.



Partnerships and Community Engagement

We provide employee engagement opportunities that foster relationships, create fulfilling experiences and enable us to make a positive difference in our communities. These opportunities are focused on supporting vulnerable youth education, aiding victims of violence and improving food security.

Supporting youth education

We partner internationally with educational groups, such as Teach for All in Mexico and Thailand. These organizations help students achieve their potential by offering learning opportunities related to STEM (science, technology, engineering and math), skill development, teamwork, leadership, critical thinking and more.

Aiding victims of violence

For over seven years, Guardian is proud to volunteer with and present charitable contributions to HAVEN, a nationally recognized nonprofit leader offering comprehensive services for survivors of domestic violence and sexual assault. Supporting those at risk is a fundamental component of being responsible stewards in our communities.

Improving food security

For over six years, Guardian is proud to support Forgotten Harvest, a charity fighting hunger and food insecurity in metropolitan Detroit, Michigan, United States. We've helped them provide meals for about 130,835 families by volunteering at their warehouse and farm each year.



Continuing Our Stewardship Efforts

Applying our principle of humility to our stewardship endeavors means we recognize that we can improve; we can do more. And that we — from the business to every individual who is part of the business: team members, customers, partners and neighbors — are a small part of something bigger.

As our vision points out, we also humbly acknowledge that our future success is not guaranteed. Complacency will lead to failure if we do not respond to the rapid changes in our industry today and tomorrow. We must improve, both in our products and services, and in our stewardship efforts.

This communication to you is one component of those efforts. It's an important tool to provide clarity about our principles and our performance in Environmental, Social and Governance (ESG) topics. We invite your feedback and look forward to future communications about our efforts and successes to further advance our stewardship work.



— RON VAUPEL

Guardian Industries CEO



ENDNOTES

1 Office of Energy Saver. Window Types and Technologies. U.S. Department of Energy, www.energy.gov

2 The embodied carbon values are based on data collected from Guardian Glass Goole. The values are pending verification for conformance to ISO 14040/44, ISO 21930, and the Product Category Rule through a program operator and independent reviewer. Numbers are subject to vary due to the critical review process. Final values will be communicated when the new EPD is published later in 2024.

The embodied carbon data is the CO₂ equivalent in kg per square meter of glass (CO₂ eq.), emitted during the glass production (A1-A3), and was calculated using a standard 4 mm thickness, not the actual glass thickness. The A1 – A3 stages include the environmental impacts from the raw materials extraction and processing stage, raw materials transportation to the manufacturing site, and the manufacturing of the product.

3 “Bird Collision Deterrence,” BD+C: New Construction. v4.1 and below

4 Second chance hiring allows individuals who have been incarcerated or have convictions an opportunity to reenter the workforce in their local communities.

5 Hartman, Michael. Ban the Box. 29 Jun 2021. Ban The Box. National Conference of State Legislatures. www.ncsl.org



Thank you to all of our team members and partners for your continued commitment and contributions to stewardship.