ARTICLE SAFETY DATA SHEET

Voluntary product information following the Safety Data Sheet format

SECTION 1 – Identification of the substance/mixture and of the company/undertaking

1.1 Product Identifier:	**Laminated Glass & Laminated Safety Glass** ▪ LamiGlass® Clear, ExtraClear & UltraClear (Standard) ▪ LamiGlass® Acoustic ▪ LamiGlass® Colored ▪ LamiGlass® Structural (XT) ▪ LamiGlass® Transwhite ▪ AntiReflective Lami ▪ Dielectric Mirror Lami ▪ Low Emissivity Lami (ClimaGuard®) ▪ Low Emissivity & Solar Control Lami (SunGuard® HP, SN, SNX) ▪ Solar Control Lami (SunGuard® HD & Solar) ▪ SatinDeco Lami *This voluntary SDS covers the entire global portfolio of laminated glass products manufactured by Guardian Industries as of the date of issue.*
EC Number: REACH Registration Number: CAS Number:	266-046-0 The substance "glass" referred to in Section 3 is exempt from EU REACH registration and is not considered hazardous. 65997-17-3
1.2 Relevant Identified Uses of the Substance or Mixture and Uses Advised Against:	
Identified Uses: Uses advised against:	Glass [AC4a] Building and Construction Work [SU19] None identified
1.3 Details of the Supplier of the Safety Data Sheet:	

World Headquarters address:
Guardian Glass
2300 Harmon Road
Auburn Hills, MI, USA 48326
+1 (248) 340 -1800 *(Monday – Friday: 8am – 5pm EST)*

Email of person responsible for this SDS: sds@guardian.com

SECTION 2 – Hazards Identification

2.1 Classification of the substance or mixture:

This product does not meet the criteria for classification in any hazard class according to OSHA 29 CFR 1910.1200 nor to EU Regulation (EC) No 1272/2008 on classification, labelling and packaging (CLP) of substances and mixtures.

Laminated glass products are defined as articles (US OSHA) or a complex objects (EU REACH Regulation) and are non-hazardous. This SDS is offered solely for your information.

2.2 Label elements:	Not Applicable

2.3 Other hazards:	This article does not meet the criteria for PBT or vPvB substances according to EU Regulation (EC) No. 1907/2006, Annex XIII

SECTION 3 – Composition / Information on Ingredients

Composition:	This product is considered a complex article. The end use is dependent upon the manufactured shape and design. This article is not anticipated to pose an exposure hazard under the intended conditions of use. Sanding, grinding, or similar activities can create nuisance dust particles. Flat soda lime silicate (SLS) glass is manufactured by the reaction of various raw materials. Some of the raw materials used in SLS glass production are crystalline substances. However, the finished glass is amorphous and does not have short range repeatable crystalline structures like crystalline materials (e.g., silica). As such, no crystalline structures are present in the finished glass product.

3.1 Substances:

Ingredient/Substance Name	Identifiers	% by Weight	Classification
Glass oxide	CAS# 65997-17-3 EC# 266-046-0	> 95-99% *	Not classified
Polyvinyl Butyral (PVB) interlayer	----	1-5%	Not classified

** Guardian sputter (vacuum) coated laminated glass products are similar in composition to uncoated laminated glass but may include slight variations of intentionally added trace components to achieve required optical properties. All substances above 1000 ppm (0.1%) are identified in the table above. Laminated glass products are treated with coatings that may contain the following substances or their oxides/nitrides at <0.1% (w/w): tin, zinc, silver, silicon, aluminum, zirconium, titanium, nickel, chromium, niobium, copper, cobalt, iron, manganese, molybdenum, tungsten, vanadium, and indium.*

Glass lites are typically stacked for shipment on racks or packed in cases and may be separated with less than 0.1 weight percent per square meter of glass of powdered interleaving material consisting of polymeric beads. Interleaving powders are used to protect the surface quality of the glass.

Laminated glass is constituted by two lites of glass joined using a polyvinyl butyral (PVB) interlayer and is defined as a complex object under EU REACH Regulation. All substances above 1000 ppm (0.1%) included in the finished product are identified in the table above.

Laminated glass products manufactured by Guardian do not contain asbestos or formaldehyde.

SECTION 4 – First Aid Measures

4.1 Description of first aid measures:

Inhalation:	Remove from exposure area and contact a physician.
Skin:	Nuisance dust particles from sanding, grinding or similar activities may cause slight irritation. Do not rub. Rinse with large quantities of water. Cuts or

	abrasions should be treated promptly with a thorough cleansing of the affected area. Serious cuts and abrasions should be treated by a physician.
Eye:	Nuisance dust particles from sanding, grinding or similar activities may cause slight irritation. Do not rub. Rinse with large quantities of water. Cuts or abrasions should be treated promptly with a thorough cleansing of the affected area. Seek medical attention.
Ingestion:	Not a likely route of exposure. Seek immediate medical attention in the event of an occurrence.
4.2 Most important symptoms and effects, both acute and delayed: None Known	
4.3 Indication of any immediate medical attention and special treatment needed: Treat symptomatically, seek medical attention if inhaled or ingested.	

SECTION 5 – Fire Fighting Measures

This article is not classified as flammable or combustible per OSHA 29 CFR 1910.1200 Appendix B neither per EU Regulation (EC) No. 1272/2008.

5.1 Extinguishing media:	
Suitable extinguishing media:	Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media:	None known
5.2 Special hazards arising from the substance or mixture:	
Hazards from the product:	None known
Hazardous combustion products:	None known
5.3 Advice for firefighters:	None known

SECTION 6 – Accidental Release Measures

6.1 Personal precautions, protective equipment & emergency procedures:	
6.1.1 For non-emergency personnel:	**Protective Equipment:** To prevent lacerations, use proper personal protection equipment (e.g., safety eyewear, cut-resistant gloves and clothing, foot protection, etc.). Refer to section 8 of this SDS for additional information on personal protective equipment. **Emergency procedures:** None identified
6.1.2 For emergency responders:	Use appropriate personal protective equipment to prevent lacerations.
6.2 Environmental precautions:	None identified

6.3 Methods and material for containment and cleaning up:	
6.3.1 For containment:	Broken product should be swept up and placed in appropriate labeled containers for disposal based on applicable local laws.
6.3.2 For cleaning up:	Dust and affected liquid should not be allowed to leak into storm/sewer water drains
6.3.3 Other information:	If feasible, recycle broken glass where facilities exist.
6.4 Reference to other sections	Not applicable

SECTION 7 – Handling and Storage

7.1 Precautions for safe handling:	Safe glass handling procedures and equipment should be used at all times to prevent accidental breakage and exposure to the broken glass. The greatest risks associated with the handling and storage of glass are lacerations from cut/broken glass and injury from falling glass. Serious injuries and fatalities may result from improper handling and transportation of float glass.
7.2 Conditions for safe storage including incompatibilities:	Properly secure glass to prevent breakage, fall, vibration and impact.
7.3 Specific end use(s)	None

SECTION 8 – Exposure Controls / Personal Protection

8.1 Control parameters:

Ingredient/Substance	OSHA PEL (TWA)	UK WEL (TWA)	ACGIH TLV (TWA)
Particulate – not otherwise regulated	15 mg/m^3(total) 5 mg/m^3 (respirable)	10 mg/m^3(inhalable) 4 mg/m^3 (respirable)	10 mg/m^3(total) 5 mg/m^3 (inhalable) 3 mg/m^3 (respirable)

As mentioned in Section 3 of this SDS, Guardian laminated glass products may contain <0.1% (w/w) of the following intentionally added substances: tin, zinc, silver, silicon, aluminum, zirconium, titanium, nickel, chromium, niobium, copper, cobalt, iron, manganese, molybdenum, tungsten, vanadium, and indium.

Consult local regulations for applicable exposure limits and monitoring procedures if applicable.
It is recommended that any operation that generates dust from these glass products be evaluated to determine if any applicable regulatory exposure limits are exceeded. If exposure limits are exceeded for dust or any trace components, appropriate engineering controls (e.g., ventilation/filtration) and/or personal protective equipment (e.g., respirators) should be utilized.

DNELs:	Not available
PNECs:	Not available

8.2 Exposure controls:	
8.2.1 Appropriate engineering controls:	If user operations generate dust then it is recommended to use appropriate engineering controls (e.g., local exhaust ventilation, process enclosures) to keep dust levels (concentrations) below acceptable limits.
8.2.2 Individual protection measures:	
Eye/face protection:	Wear appropriate protective eyeglasses with side shields or chemical safety goggles as described European Standard EN166 (or country equivalent). If user operations generate dust, then it is recommended to ensure that eyewash stations are located close to the workstations.
Skin protection:	Wear appropriate cut-resistant personal protective equipment, protecting parts of the body that may be exposed to glass during typical glass handling and processing operations or transport (e.g., anti-lacerative gloves, cuffs, jackets, hard hats, steel-toed shoes, etc.)
Respiratory protection:	Respiratory protection may be required if effective engineering controls are not effective at keeping dust exposure during sanding, grinding, or similar activities below acceptable limits. Use a European Standard EN 149 approved respirator (or country equivalent) if exposure limits are exceeded or if irritation or other symptoms are experienced.
8.2.3 Environmental exposure controls:	Not applicable

SECTION 9 – Physical and Chemical Properties	
Physical state:	Solid
Odor:	Odorless
Odor threshold:	Not applicable
pH:	Not applicable
Melting point:	1500°F (815°C)
Boiling point:	>2000°F (1093°C)
Flash point:	Not applicable
Evaporation rate:	Not applicable
Flammability (solid, gas):	Not applicable
Upper/lower flammability limits:	Not applicable
Vapor pressure:	Not applicable

Vapor density:	Not applicable
Relative density:	2.4 – 2.6
Solubility in water:	Insoluble
Partition coefficient: n-octanol/water:	Not applicable
Auto-ignition temperature:	Not applicable
Decomposition temperature:	Not applicable
Viscosity:	Not applicable
Explosive properties:	Not applicable
Oxidizing properties:	Not applicable
Volatile Organic Compounds (VOC):	Glass is by nature an inert material that does not release volatile organic compound (VOCs). There are no VOCs present in finished laminated glass products.

SECTION 10 – Stability and Reactivity

10.1 Reactivity:	No known hazardous reactions
10.2 Chemical stability:	Stable
10.3 Possibility of hazardous reactions:	None identified
10.4 Conditions to avoid:	None identified
10.5 Incompatible materials:	None identified
10.6 Hazardous decomposition products:	No known hazardous decomposition products

SECTION 11 – Toxicological Information

11.1 Information on toxicological effects:

Acute toxicity:	None known, non-hazardous
Skin corrosion / irritation:	None known, non-hazardous. Nuisance dust particles from sanding, grinding or similar activities may cause slight irritation.
Serious eye damage / irritation:	Nuisance dust particles from sanding, grinding or similar activities may cause slight irritation.
Respiratory or skin sensitization:	None known, non-hazardous
Germ cell mutagenicity:	None known, non-hazardous
Carcinogenicity:	Glass and glass dust are not listed as carcinogens (IARC, NTP and US OSHA)*.

Reproductive toxicity:	None known, non-hazardous
STOT – single exposure:	None known, non-hazardous
STOT – repeated exposure:	None known, non-hazardous
Aspiration hazard:	Not applicable

**Note: Some laminated glass products are treated with coatings that may contain the following substances or their oxides/nitrides at <0.1% (w/w): titanium, nickel, chromium, cobalt, and indium.*

SECTION 12 – Ecological Information

12.1 Toxicity:	This product is not classified as toxic.
12.2 Persistence and degradability:	Not applicable
12.3 Bioaccumulative potential:	Not applicable
12.4 Mobility in soil:	Not applicable
12.5 Results of PBT and vPvB:	This article does not meet the criteria for PBT or vPvB substances according to EU Regulation (EC) No. 1907/2006, Annex XIII
12.6 Other adverse effects:	No known significant effects or critical hazards.

SECTION 13 – Disposal Considerations

13.1 Waste treatment methods:	Glass, dust and cullet disposal should be conducted in accordance with applicable regulations. Reuse or recycle in accordance with applicable regulations. Disposal of wastewater and other discharges or emissions from glass processing operations should be done in accordance with applicable regulations.

SECTION 14 – Transport Information

U.S. DOT (49 CFR):	Not regulated as a dangerous good
Canada TDG:	Not regulated as a dangerous good
UNRTDG:	Not regulated as a dangerous good
EU ADR / RID:	Not regulated as a dangerous good
EU ADN:	Not regulated as a dangerous good
IATA:	Not regulated as a dangerous good
IMDG Code:	Not regulated as a dangerous good

Europe:	Glass is not classified as hazardous under European Regulation (EC) No 1272/2008 and does not require specific transportation conditions.

SECTION 15 – Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture:

EU Restriction of Hazardous Substances (RoHS) Directive 2015/863

Raw clear float/flat glass used in the manufacture of laminated glass may contain the contaminants chromium, cadmium, and/or lead (present as impurities at very low concentrations in mined raw materials such as silica or limestone) at concentrations well below the threshold limits for RoHS. These substances are the only RoHS hazardous substances that have the potential to be in our glass (typically undetected or in the parts per billion range). RoHS substances are not intentionally added to Guardian laminated glass products during the manufacturing process.

Regulation (EC) No. 1907/2006 (REACH) Annex XIV List of substances subject to authorization:	No constituents are present above the 0.1% by weight threshold
Regulation (EC) No. 1907/2006 (REACH) Annex XIV Candidate List of Substances of Very High Concern (SVHC):	No constituents are present above the 0.1% by weight threshold
Regulation (EC) No. 1907/2006 (REACH) Annex XVII – Restrictions on the manufacture, placing on the market and certain dangerous substances, mixtures and articles:	Not applicable
Regulation (EC) No. 649/2012 of the European Parliament and the Council concerning the export and import of dangerous chemicals:	Not applicable
Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer:	Not applicable
Regulation (EC) No. 850/2004 on persistent organic pollutants:	Not applicable
Seveso III Directive 2012/18/EU of the European Parliament and the Council on the control of major-accident hazards involving dangerous substances:	Not applicable
SARA 302/304:	Not applicable
SARA 311/312:	Not applicable
SARA 313:	Not applicable
US EPA TSCA 8(b):	All chemical substances in this article are included or exempt from the EPA TSCA 8(b) chemical inventory.

California Safe Drinking Water and Toxic Enforcement Act of 2016 (Proposition 65):	Certain coatings present on Guardian laminated glass products may contain the following substances present on the California Proposition 65 list dated March 19, 2021: cobalt metal powder, cobalt (II) oxide, nickel and nickel compounds. Guardian laminated glass products are articles per OSHA 29 CFR 1910.1200. Its end use is dependent upon the manufactured shape and design. Guardian laminated glass products will not pose an exposure hazard during routine handling and intended use by the final consumer. The aforementioned substances are present in trace quantities and encapsulated in a coating layer not accessible to the consumer during routine handling and use. Guardian Glass does not directly sell glass products directly to consumers. Guardian sells commercial and residential glass products to fabricators so that it can be utilized as a raw material in their finished product. If a downstream fabricator manipulates Guardian laminated glass products (cutting, sanding, grinding, edge-deleting or similar activities) in a way that may produce dust, then it is recommended that the fabricator evaluate the process to determine the potential for any occupational exposures.
Voluntary Chemical Substance Declaration Schemes	
Cradle-to-Cradle (C2C) Banned List of Chemicals	No constituents are listed
Living Building Challenge 4.0 (Red List)	No intentionally added constituents are present. See Guardian RoHS Statement.
15.2 Chemical Safety Assessment:	Not Applicable- no Chemical Safety Assessment has been carried out for this article by the supplier.

** Note: For C2C certificates for uncoated float glass products produced at Guardian float plants in Europe please visit: https://www.guardianglass.com/eu/en/who-we-are/our-expertise-and-commitments/sustainability/cradle-to-cradle.*

SECTION 16 – Other Information

This product is an *article* as it does not conform either to the criteria given in Article 31(1) (a), (b) and (c) or to those in Article 31(3) for when SDSs are required. The substance "glass" referred to in section 3 and "*articles*" manufactured from it are exempt from EU REACH registration.

Abbreviations and acronyms:	AICS – Australian Inventory of Chemical Substances; AICS – Australian Inventory of Chemical Substances; CAS – Chemical Abstract Service; CFR – Code of Federal Regulation; CLP – Classification Labeling Packaging Regulation [EU Regulation (EC) No. 1272/2008]; DNEL - Derived No Effect Level; DSL – Canada Domestic Substances List; ECHA – European Chemicals Agency; EC Number – European Community number; ENCS – Japan Existing and New Chemical Substances; EPA – U.S. Environmental Protection Agency; EU – European Union; EU ADN – European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; EU ADR – European Agreement concerning the

	International Carriage of Dangerous Goods by Road; GHS – Globally Harmonized System; IARC – International Agency for Research on Cancer; IATA – International Air Transport Association; IECSC – Inventory of Existing Chemical Substances in China; IMDG – International Maritime Dangerous Goods; ISHL – Industrial Safety and Health Law (Japan); KECI – Korea Existing Chemicals Inventory; MSHA - Mine Safety and Health Administration; NIOSH - National Institute for Occupational Safety and Health; NTP – National Toxicology Program; NzloC – New Zealand Inventory of Chemicals; PBT – Persistent, Bioaccumulative, and Toxic substance; PEL – Permissible Exposure Limit; PICCS – Philippines Inventory of Chemicals and Chemical Substances; PNEC - Predicted No Effect Concentration; REACH – Regulation (EC) No. 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation, and Restriction of Chemicals; RID – EU Regulations concerning the International Carriage of Dangerous Goods by Rail; SDS – Safety Data Sheet; STOT - specific target organ toxicity; TCSI – Taiwan Chemical Substance Inventory; TLV – Threshold Limit Value; TSCA – Toxic Substances Control Act (United States EPA); TWA – Time Weighted Average; UK – United Kingdom; UNRTG – United Nations Recommendations on the Transport of Dangerous Goods; U.S. – United States; U.S. DOT – U.S. Department of Transportation; U.S. OSHA – U.S. Occupational Safety and Health Administration; vPvB – Very Persistent and Very Bioaccumulative; WEL – Workplace Exposure Limit
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Prepared by:	Guardian Industries Product Stewardship
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