

MATERIAL SAFETY DATA SHEET

Flat Glass

- Emergency Overview:** Product may have sharp edges. Improper handling may cause lacerations. Flat glass products in their normal state do not present an inhalation or ingestion hazard. Fabrication operations such as cutting, grinding, seaming, edging or breaking may result in the release of airborne dust which may present a health hazard.
- Likely Routes of Exposure:** Direct skin contact and/or inhalation of dust.
- Potential Health Effects:** See Section 11
- Acute Signs and Symptoms of Overexposure:** Irritation of eyes, nose, and throat when exposed to dust.
- Chronic Signs and Symptoms of Overexposure:** No known specific disease associated with chronic exposure.
- Carcinogenicity:** Not listed in IARC, OSHA, or NTP.
- Medical Conditions Generally Aggravated by Exposure:** None during normal handling of glass. Persons with impaired respiratory function or pre-existing skin disorder may be more susceptible to exposure of dust if cutting or grinding glass.

Other:

The coatings of the coated glasses listed in section 1 are all based on stable oxide materials, listed in section 3. These oxides are in integral part of the glass product and there is no separate exposure, but the Material Safety Data Sheet of the oxides can be reviewed for further information. Note that X-ray diffraction analysis has demonstrated that all the silica (SiO₂) deposited on the glass is non-crystalline and as such does not pose a risk of silicosis.

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

<u>Component(s)</u>	<u>Wt %</u>	<u>CAS No.</u>
Glass, Oxide, Chemicals	100	65997-17-3

This product is not considered to be or to contain hazardous chemicals based on evaluations made by our company under the US Hazard Communication Standard, 29 CFR 1910.1200. Dust generated during breakage or fabrication of this product is an amorphous silicate and should be considered a "nuisance particulate".

In Europe, EINECS identifies glass in the following terms: Glass, oxide, chemicals (EC:266-046-0)

The products listed in section 1 are based on typical soda-lime-silicate flat glass. Trace amounts of the metals Fe, Se, Ni, Cr and Co are purposely added to some compositions to colour the glass and trace amounts of Pb is sometimes present as a contaminant.

Coatings

On line coatings are deposited onto the glass at high temperature to form hard durable coatings on the surface of the glass. These coatings comprise of single or multiple layer coatings and are between 15 and 350 nm in thickness. Due to the nature of the deposition process the coatings are either amorphous or polycrystalline and adhere strongly to the glass surface.

Depending on the desired product characteristics, the coatings are based on the oxides of the following elements: Si, Sn, Ti, Fe and Sb. Very small quantities (a few atom percent) of other "dopant" chemicals are added to modify the products optical and physical characteristics.

MATERIAL SAFETY DATA SHEET

Flat Glass

SECTION 4 FIRST AID MEASURES

Glass dust:

Eye: Wash out immediately with large volumes of water. If necessary, contact physician.

Skin: Wash with soap and water. Do not rub.

Inhalation: Remove from exposure and contact physician.

Ingestion: Seek medical attention.

Flat glass:

Eye: Wash out immediately with large volumes of water. If necessary, contact physician.

Skin: If laceration occurs seek appropriate first aid or medical attention for cuts and bleeding.

Inhalation: None.

Ingestion: None.

SECTION 5 FIRE FIGHTING MEASURES

Flash Point: N/A Extinguishing Media: N/A

Flammable Limits: LEL: N/A UEL: N/A Special Fire-Fighting Procedures: None

Auto Ignition Temperature: Non-flammable. Unusual Fire and Explosion Hazards: None.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Personal Precautions: Safety glasses/goggles recommended to protect eyes in the event of breakage.

Steps Taken in Case Material is Released or Spilled: N/A

Waste Disposal Methods: Not considered a hazardous waste. (Consult Federal, State and Local Regulations). Recycle wherever appropriate facilities exist.

SECTION 7 HANDLING AND STORAGE

Handling: Use proper material handling equipment to avoid accidental breakage. Ensure product is handled with proper PPE to avoid lacerations. Stand out of the danger zone when moving glass.

Storage: Secure glass against breaking, falling, impact and vibrations

MATERIAL SAFETY DATA SHEET

Flat Glass

SECTION 8 EXPOSURE CONTROLS & PERSONAL PROTECTION

The greatest risk in the handling and storage of glass is through laceration. Appropriate precautions to prevent the risk of this should be taken e.g. eye protection, cuffs, gloves, foot protection, head protection if handling above head height, etc.

Respiratory Protection:	Respiratory protection is not required under normal use of this product where there are no cutting or grinding operations that may generate dust. Respiratory protection may be necessary if engineering controls are not used to reduce dust generation during cutting or grinding operations. If respiratory protection is deemed necessary from exposure monitoring data, follow OSHA regulation 29 CFR 1910.134 or other local regulations. Always use a NIOSH or other approved respirator when necessary.
Specified Type:	NIOSH/MSHA/CEN approved for particulates.
Ventilation:	Use local exhaust as required to maintain dust below TLV or PEL.
Protective Gloves:	Anti-lacerative gloves recommended
Eye Protection:	Goggles or face shield
Other Protective Clothing or Equipment:	Glass handlers' cuffs, chaps, and apron
Work/Hygienic Practices:	Use wet methods during grinding or cutting to reduce dust generation

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point:	N/A	Specific Gravity (H ₂ O = 1):	2.45
Vapor Pressure (mm Hg):	N/A	Vapor Density (Air = 1):	N/A
Evaporation Rate (BuAc=1):	N/A	Solubility in Water:	Insoluble
Melting Point:	>2000°F, >1100°C	Volatility:	Not Volatile
Appearance and Odor:	Solid, clear or pale green or tinted to various shades depending on product type. No odor.		

SECTION 10 STABILITY AND REACTIVITY DATA

Stability:	Stable
Incompatibility (Materials to Avoid):	None known
Hazardous Decomposition Products:	None
Hazardous Polymerization:	Will not occur

MATERIAL SAFETY DATA SHEET

Flat Glass

Conditions to Avoid: None known

The coated products listed in section 1 are all designed to pass European Standard (EN1096) which tests the coatings' durability to high temperatures, humidity, corrosive atmospheres and abrasion to ensure the coatings are not damaged or release materials in service. The coatings are stable during production processes e.g. toughening and IGU formation. The coatings' surface is stable and inert. The only exception to this is Pilkington **Activ™** self-cleaning glass, where the surface acts as a photo catalyst accelerating the decomposition of organic dirt, but it is not used up or changed during the catalytic process.

SECTION 11 TOXICOLOGY INFORMATION

Flat glass products in their normal state do not present an inhalation or ingestion hazard. Fabrication operations such as cutting, grinding, seaming, edging or breaking may result in the release of airborne dust which may present a health hazard. Dust generated during breakage or fabrication of this product is an amorphous silicate and should be considered a "nuisance particulate".

US regulation

Component	CAS No.	PEL	TLV
Particulate – not otherwise regulated	65997-17-3	15 mg/m ³ (total)	10 mg/m ³ (inhalable)
		5 mg/m ³ (Respirable)	3 mg/m ³ (Respirable)

UK occupational exposure standards are 10 mg/m³ total inhalable nuisance dust (8 hour time weighted average) and 4 mg/m³ for respirable nuisance dust (8 hour time weighted average). Other countries' exposure standards may vary and local guidance should be followed wherever appropriate.

IOELVs are health-based limits set under the European Chemical Agents Directive (98/24/EC). Pilkington Glass is not assigned an IOELV.

SECTION 12 ECOLOGICAL INFORMATION

No adverse effects recorded or foreseen.

SECTION 13 DISPOSAL CONSIDERATIONS

Glass and glass dust can be recycled into some new glass products and should be recycled wherever appropriate and possible.

Glass and glass dust is not considered a hazardous waste under USEPA RCRA, or European Hazardous Waste Directive definitions.

In Europe, waste from manufacture of glass and glass products have the following Consolidated European Waste Catalogue references -

- 10 11 12 Waste glass (other than those mentioned in 10 11 11)
- 10 11 14 Glass polishing and grinding sludge (other than those mentioned in 10 11 13)

Dispose as an industrial waste per local requirements.

For the coated glass products listed in section 1, the amount of material in the coatings is extremely small and has an insignificant impact on the composition of the glass with regard disposal. The coated glass can be recycled through conventional means.

MATERIAL SAFETY DATA SHEET

Flat Glass

SECTION 14 TRANSPORTATION INFORMATION

Glass and glass dust is not a hazardous material under USDOT regulations, RQ = NA.

Glass and Glass dust is not considered dangerous goods per Canadian TDG regulations.

Glass is not classified as hazardous under European Directive 67/548/EC or Regulation 1272/2008 and does not require specific transportation conditions.

SECTION 15 REGULATORY INFORMATION

Carcinogenicity:	Glass and Glass Dust is not listed by IARC, NTP or OSHA
EPCRA, CERCLA, SARA:	Glass and Glass dust is not listed as an Extremely Hazardous Substance under Section 302 and is not listed as a Hazardous Substance under Section 304 The products do not contain any listed Section 313 (40 CFR 372) chemicals in amounts above the <i>de minimis</i> notification levels.
Reportable Quantity (RQ):	NA
TSCA (USA):	Listed
REACH:	Note that this document does not constitute a Safety Data Sheet with regard the European REACH regulation. The substance " <i>glass</i> " and manufactured " <i>articles</i> " referred to in section 1 are exempt from REACH registration and thus do not require a Safety Data Sheet.
RoHS:	The European Restriction of the Use of certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) Directive bans the placing of new electrical and electronic equipment on the EU market containing more than certain levels of lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE) flame retardants. The products listed in section 1 meet these requirements and do not exceed threshold levels
Directive 67/548/EC:	Not classified
Regulation EC 1278/2008:	Not classified

SECTION 16 OTHER INFORMATION

The information presented above is believed to be accurate and reliable to the best of our knowledge, however Pilkington makes no warranties expressed or implied regarding this information. In addition, since the use of the product is not within the control of Pilkington, it is the user's obligation to determine the conditions of safe use of the product.

Revised and updated by: Simon Slade, Pam Rygalski. Pilkington NSG.

Date: 16/04/10