

# Storage and handling

Pyroguard products: guidelines for users

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# 1 Introduction

This section provides details on the correct handling and processing of Pyroguard fire safety glass products to maintain their quality and uphold the product warranty.

## 1.1 Storage

Pyrostem, Pyroguard Advance, Pyroguard Rapide and Pyroguard Rapide Plus glass should always be stored in their original end-cap case or, when unpacked, on suitable racking as used throughout the glass industry. Particular attention should be given to the bottom/resting edge to ensure it is not in contact with an uneven or hard surface. Care should be taken when handling the glass remembering that, until glazed, the individual thin glass layers may be damaged by small edge impacts.



All glass products should be stored indoors in dry conditions out of direct sunlight.

For manual handling, appropriate PPE should be worn and training should be given and recorded on a training matrix, as is standard practice for CE Marking in the glass industry. Care should be taken with the heavier weight of larger and thicker sheets.

- Store stock packs or panes in their original end-cap case
- Store glass internally; away from rainfall and direct sunlight.
- Always store in dry conditions, stacked upright – at an absolute maximum 6° inclination from the vertical –
- Fully supported on suitable racks offering a firm surface, that prevents the glass from sagging.
- The bottom of the glass or units must be evenly in contact with the support surface along the entire length.

- Stacked glasses or insulating glass units should be separated by soft pads, such as cork.

Additional handling guidance can be found via the GGF website in their publication, Code of Practice: Glass Handling, Storage and Transport <https://www.ggf.org.uk/>

## 1.2 Loading and unloading

### 1.2.1 Loading and distribution of stock packs



Once the pack is ready for distribution, prior to loading, an outer label should be applied with the correct customer details. This label should bear the CE Mark and/or the UKCA Mark and should be kept with the pack until all the glass in the pack has been used. The information contained within the label must be passed on through the individual cut sizes to the point of installation.




Check lifting points and end-cap conditions prior to the lift. End-caps should be banded or suitably restrained individually to allow them to be withdrawn one at a time. Whilst unloading glass from a single end-cap it should be placed on a case or block supports set at 4-5° lean. Care should be taken when removing metal banding from end-caps. Eye protection and gloves should be worn by the person cutting the banding and no-one should be near enough to be struck by the strap whipping when cut.

## 1.2.2 Procedure for safe unloading and lifting of stock sheet packs





Stock sheet packs of Pyrostem, Pyroguard Advance, Pyroguard Rapide and Pyroguard Rapide Plus should be lifted in the following manner, preferably by an overhead crane.

Below is an example Operating Procedure (OP) for safe unloading of end caps. Customers are obliged to create their own OP and risk assessment of the operation and may use this as a resource.

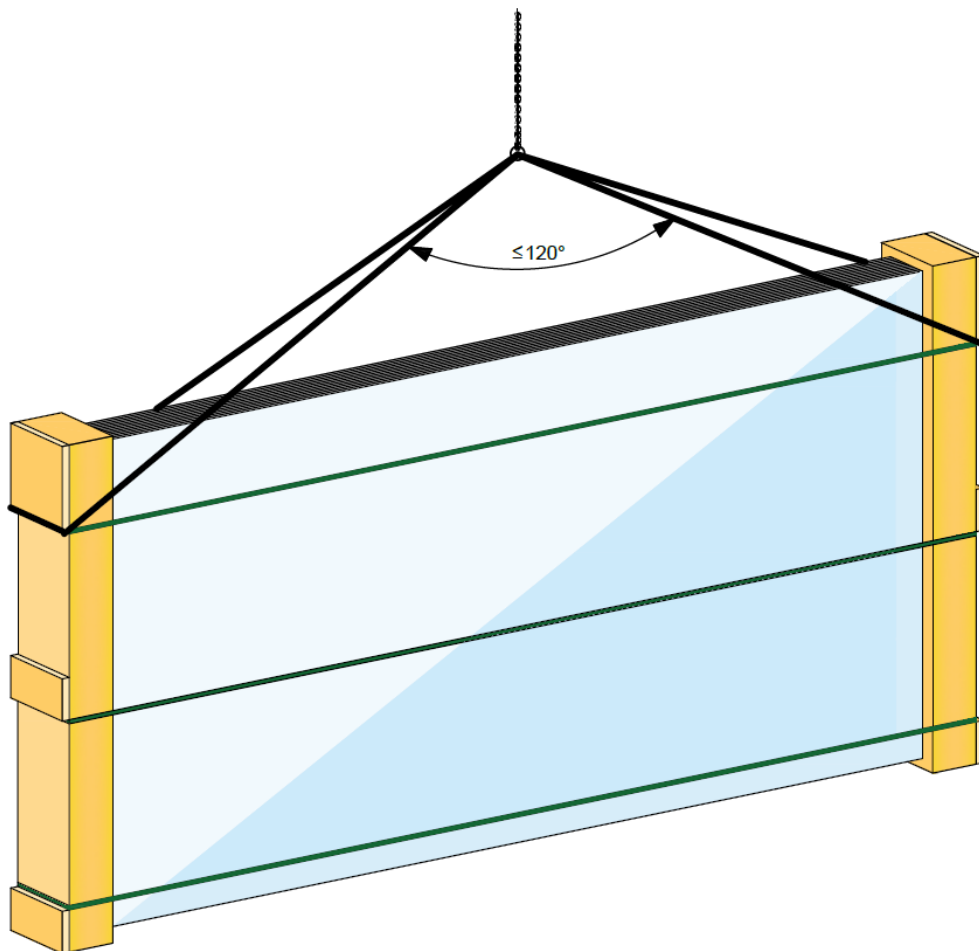
No.	Main steps	Operation description		Key Points
1	Crane	Check equipment is in good working order.		Only operators with a current crane operating licence may undertake this operation.
2	Loading bay	The loading bay should be clear of obstructions, and pedestrians should be denied access.		The only people permitted within the loading bay should be those involved with unloading.
3	Access to lorry	Access to the vehicle load bed must only be made using stable, secure steps.		Check that the daily ladder inspection has been done. Inspect if not completed for that day.

4	Slings	<p>Only use wire sling ropes with a safe working load of 3.5T to remove the load of float glass.</p>		<p>Check slings for damage prior to use.</p> <p>Report any damage to superior and do not use.</p> <p>Sling safety tag should be present and up to date.</p>
5	Unloading	<p>Before starting unloading, examine glass packs to ensure the load is safe.</p> <ol style="list-style-type: none"> <li>1. There must be a minimum of 1 m around the stack to enable safe movement.</li> <li>2. The packs are to be banded in such a way that when the strap is removed all other packs are secure as per instruction 6 and 7.</li> </ol>		<p>If the load is not received to the required standard inform the Operations Manager immediately and ask for permission to unload.</p>
6	Unloading order	<p>Glass packs are to be unloaded as per instruction 7 in the order shown. This is to prevent glass packs not being secure following the lift.</p> <ol style="list-style-type: none"> <li>1. Unload outside two packs secured by the full banding.</li> <li>2. Unload the outside two packs on the opposite side which will now be fully strapped.</li> <li>3. Return to original side to unload the pack which will now be fully strapped.</li> <li>4. Unload final pack.</li> </ol>		



7	Pack unloading	<ol style="list-style-type: none"> <li>1. Two operators are required to unload the glass packs. The crane operator is to be at the rear of the vehicle to allow safe exit without crossing the front of the packs. The second operator will stay at the opposite end of the stack for the entire unloading operation.</li> <li>2. Bring crane slings into position and use sling retrieving hooks provided to enable slings to be attached to the endcap without walking across the load.</li> <li>3. Attach crane slings to endcaps at loading points and secure glass packs. See Figure 1 for an illustration of how to fix the slings.</li> <li>4. Raise the crane to secure the packs to be lifted. Check that once the banding is cut all other packs will still be banded.</li> </ol> <p>Cut the banding securing the packs to be lifted from the rest of the stack.</p> <p>Crane packs to float glass storage area.</p> <ol style="list-style-type: none"> <li>5. Repeat process for other packs as per unloading order described in instruction 6.</li> <li>6. Non crane operator is to remain in position until all packs are removed and should not walk in front of glass packs.</li> </ol>	   	<p><b>It is not permitted to be in the area in front of the glass packs.</b></p> <p>Operation to be carried out by two operators ensuring no need to walk across the face of the glass packs.</p> <p>Plan route point-to-point before beginning operation. Ensure there are no hazards and that the route is clear.</p> <p>Chains need to be raised and <b>under tension</b> before cutting the banding.</p>
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9	Removal of tackle	<ol style="list-style-type: none"> <li>1. Release tackle from pack.</li> <li>2. Remove crane and tackle from the area.</li> <li>3. Return tackle to storage.</li> </ol>		
10	Final steps	<ol style="list-style-type: none"> <li>1. Driver is responsible for ensuring all scrap packaging is tidied up.</li> <li>2. The polystyrene boards from stacks shall be taken away on the vehicle.</li> <li>3. Ensure any glass faults are marked on delivery paperwork.</li> </ol>		



**Figure 1 Sketch illustrating typical lifting points for Pyroguard stock sheet end capped packs. Note maximum recommended angle.**



### 1.2.3 Unloading a pack with HIAB

- Glass should be unloaded by the HIAB driver
- Store at an angle of 7°(minimum) before removing end-cap
- Secure pack with banding or suitable device if transporting
- Before lifting, ensure no-one is stood within 4 metres of the load

### 1.2.4 Unloading normal

- Before removing banding, ensure that the pack is secured by crane and all other packs are still banded to the A-frame
- Glass should be carried at a low level
- Do not leave pack free-standing
- Store at an angle of 7° (minimum) before removing end-cap
- Before lifting, ensure no-one is stood within 4 metres of the load

## 1.3 Storage and handling of Pyroguard Protect to ensure quality

Pyroguard Protect glass products should always be stored in their case or when unpacked on suitable racking as used throughout the glass industry. Particular attention should be given to the bottom/resting edge to ensure it is not in contact with any uneven or hard surfaces.

All glass should be stored in dry indoor conditions out of direct sunlight. Glass should be stored between -10 and +45°C. Care should be taken when handling the glass remembering that, until glazed, the individual glass layers may be damaged by small edge impacts.

For manual handling PPE should be worn, as normal in the glass industry, and care should be taken with the heavier weight of larger and thicker sheets.

## 2 Shipping

### 2.1 Pyroguard stock sizes

Pyroguard stock sheets are shipped in end caps. Further distribution of sheets should be in similar packaging or on appropriate A or L frames.

### 2.2 Stillage / cases

Glass will often be transported by land, air and sea. The packaging required must allow for the risk of damage and in turn the safety of operators handling glass. Pyroguard must be secured to a frame or packed securely prior to shipping. Usually, a stillage or a case is used. Packaging should guard against heavy vibration by setting the glass on soft materials. It should guard against direct impact during shipping and protect against rainfall usually by wrapping in a film. The stillage selected should be larger in face dimensions than the glass to be shipped to avoid direct impact with the glass during shipping.

Frails shall have an angle of lean of at least 4°, if the vehicle is parked on horizontal ground under the most unfavourable loading conditions. For loading or unloading single plates or glass units, the frail shall be provided with a device which indicates to the operator that the angle of lean is maintained correctly.

Protect against tipping of the package by having wide based stillage or cases to prevent excessive stress on the glazing.

### 2.3 Glass retention devices

Provisions shall be made for retaining the glass. If retention devices are not part of the equipment, appropriate instructions shall be included in the accompanying documentation. The design of glass retention devices shall demonstrate sufficient resistance to the glass; the mass of the glass to be transported, the dynamic forces and the friction forces which can occur under extreme operating conditions. Therefore, take into account the following:

- a. Prevention of damage to the glass;
- b. Measures against failures or the unintended release of the retention devices.

The design of glass retention devices shall demonstrate sufficient resistance to the glass; the mass of the glass.

## 2.4 Belts / straps

Belts or straps are manufactured in accordance with the requirements of EN 13246. Glass should be strapped to the case or stillage to avoid it moving independently of the packaging. The supplier will ensure that the banding used is suitable to retain the glass in transit. Consideration should be given to the movement of the stillage and decanting where additional banding may be required. Panes can be banded or suitably restrained individually to allow them to be withdrawn from the stack one at a time.

Avoid excessive stress on the glazing. Glass should be lightly strapped, and edge protectors used to avoid glass and strap contact.

## 2.5 Edge protectors

Edge protectors are manufactured to EN 13393 in a wide variety of forms and sizes, which are categorised as follows;

- Flat: Flat or strip form used for product protection, normally folded or wrapped around the edge during application of the strap.
- Corner protectors: Small molded cut or formed pieces (up to 100 mm in length) used as edge protectors where no additional packaging strength is provided.
- Profiles: Pre-formed lengths (greater than 100 mm in length) used for edge protection or reinforcement.

## 2.6 Pads

Due to the nature of glass transportation, there is a risk that a vacuum can be created between sheets. The supplier shall ensure that appropriate transit pads have been fixed to protect the glass and reduce the risk of injury when unpacking, particularly where a vacuum could cause a breakage of glass.

## 2.7 Shipping

Securing the load to the vehicle will be the joint responsibility of the driver and consignor. However, the supplier must ensure that the glass, stillage or packing crate is properly stowed on the vehicle. Information related to the correct storage of packed glass must be passed to the logistics department/company when transport is arranged. Ideally a loading/securing plan needs to be drawn up and agreed by the consignor and logistics provider. Due to its fragile nature and varying sizes, glass must be secured on the vehicle. Using a similar process for stowing glass on a stillage or in a

crate, securing straps must be in good condition and of a suitable tensile strength, complete with edge protectors where necessary to secure the pack or stillage from moving in transit.

Anchor points, retaining straps and headboards are common place on flat bed, inloaders and curtain-sided trailers and should be utilised as an integral part of the load securing requirements where and when possible. Anchor points must meet the relevant standards. For example, eye bolts to BS 4278-19846 and shackles to BS 35517 must be used to attach straps prior to departure. The supplier shall check themselves that the glass is properly secured for transport before permitting its departure.

It is advised not to ship Pyroguard IGU by air due to problems of pressure equalization. The conditions of transport should be considered to avoid subjecting the Pyroguard glass to conditions beyond its capability.

At the destination, product should be arranged to be stored undercover and safely away from construction vehicles and moving equipment to avoid site damage. The conditions of storage should be considered to avoid subjecting Pyroguard fire safety glass to conditions beyond its capability.

## 3 Glazing

### 3.1 Unpacking from shipping packaging

Check lifting points, stillage and case conditions prior to the lift. The size and configuration of these units must have already been agreed between supplier and principal contractors before dispatch, therefore an agreed method, and equipment to be used, should be in place before the consignment arrives on site. Stillages and cases should be banded or suitably restrained individually to allow them to be withdrawn from the stack one at a time. Whilst unloading, use appropriate restraints to retain remaining cases in position to prevent any movement due to wind, impact or other actions. Do not overload frames or racking when unloading single cases, chocks must be used under them to give the required angle and prevent forward movement of individual sheets or the case. Cases that can lean on 'A' frames or other purpose-built racking that can support the materials in a stable manner at a lean of 3-6° from vertical is commonly recommended. 5-6° is recommended for transportable racks, pallets and stillages.

### 3.2 Installing

Unless stated otherwise hardwood or non-combustible setting blocks (Vermiculite, Promatect H, Supalux, etc.) should be used to position the glass in the aperture in order to give sufficient edge cover, to ensure room for thermal expansion, good fire performance, stable positioning, elevation of the glass in the rebate and to hide any edge sealant.

In doors, glasses are often glazed heel-toe with four setting blocks at a diagonal to ensure that the glass does not move.

The following table lists typical edge cover allowance for Pyroguard products.

Range	Type	Edge cover*
VI, TVI (IGU, TGU)		≥13 mm
Pyroguard Protect	Toughened nanocomposite gel	≥13 mm
Pyroguard Firesafe	Toughened-monolithic (and VF variants)	6-10 mm
Pyroguard Rapide	Cuttable resin	≥10 mm
Pyroguard Rapide Plus	Cuttable sodium silicate	≥10 mm
Pyroguard Advance	Cuttable nanocomposite gel	≥10 mm
*please request specific guidance when planning testing		



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