IMAGIN

PROCESSING GUIDE

VERSION 4.0 – AUGUST 2023

Your Dreams, Our Challenge

This version of the guide cancels and replaces all previous versions.

Please check www.agc-yourglass.com regularly for updates.

CONTENTS

1. PACKAGING

IMAGIN glass are available:

- in wooden boxes transported on A-stands in soft-sided truck
- or in open-top containers;
- in packs that are put on special returnable folding 13-tonne A-frame racks for transporting packs. The sheets are usually placed with the smooth side facing out, with 3 cm thick polystyrene interliners. These racks are transported by soft-sided truck.

2. STORAGE

Proper storage helps prevent damage caused by the following:

- chemical reaction – stains on the surface caused by water, moisture and condensed steam;
- mechanical – uneven surface, bending, breakage, etc.

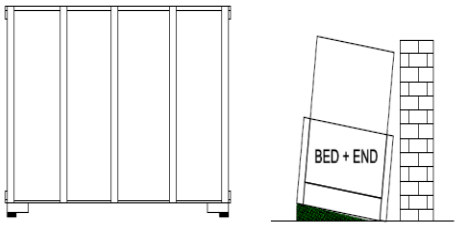
The ideal storage space is dry and well ventilated, with a temperature of at least 5 °C. The recommended temperature range is from 15 to 25 °C with an indoor relative humidity of up to 70%.

Glass showing signs of moisture due to changes in temperature during transport must be dried or processed as soon as possible.

As a general rule, you should make sure that the flow of glass in the warehouse is as fast as possible.

The boxes should be:

- kept on an even, dry and clean floor;
- leaned against a supporting structure at an angle of between 3° and 6°;
- You should use a retractable support rod or insert wedges to avoid any tilting.



using rubber wedges

Packs can be stored:

- on stillages(racks);
- in retractable boxes (bookshelves).
  - Always on a rubber pad, leaning on a stillage rack, with attached rubber straps.

3. HANDLING INDIVIDUAL SHEETS

3.1. Removing sheets from boxes

- The wooden box must lean against the supporting structure at a safe angle of between 3° and 6°.
- To ensure stability you should insert wedges under the box in order to prevent it from falling to the side.
- Use a nail claw to pull out the nails and gently remove the vertical planks.
- Individual sheets can be taken out using hand held vacuum lifters, a suction frame (the box with glass has to be moved beforehand, so that the smooth side is facing out) or lifting hooks.

- The sheets can also be removed from the box by hand, depending on their size and weight.

3.2. Unloading sheets from a pack

- This should be done:
  - with hand-held vacuum lifters;
  - with a suction frame;
  - with lifting hooks;

  - or by hand (following the general guidelines below).

3.3. General guidelines

- You must always assess the loading capacity of your equipment, the weight of the sheet and the adhesive capacity of the glass surface against the suction cups.
- Your equipment must be in good technical condition and approved for the task in question.
- The operator removing individual sheets must always stand to the side or next to the glass pane, and never in front of the open box or an unsupported loose pane.
- If individual sheets are handled manually, they must always be moved vertically.
- You can manually handle only sheets measuring up to 213 x 161 cm and weighing up to 30 kg.
- You must avoid any contact with heavy-duty equipment.
- Your working space must be large enough with an even, clean floor and no obstacles.
- Operators must wear suitable personal protective equipment and must be properly trained to perform the tasks in question.
- Before starting the task you must assess potential risks and identify appropriate measures to ensure a safe working environment.
- You must only handle glass sheets that have no crack nor edge defects.

4. HANDLING BOXES AND PACKS

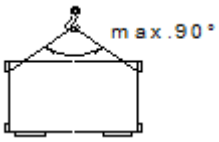
4.1. Handling boxes

The boxes should be handled using:
- lifting equipment (a crane);
- a forklift with a glass lifting attachment;
- a special multidirectional forklift.

4.1.1 Handling using lifting equipment (a crane)

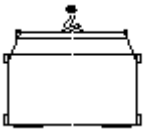
- The boxes are attached to the crane with steel chains, steel wire rope or webbing slings with relevant lifting capacity, length and suspension angle.
- You should not handle more than two boxes at a time.

- The boxes are suspended by the upper lips on either end of the box.
- In case the safe angle of the slings is not respected, you must handle the boxes using a crossbar of appropriate length, with short sling eyes.
- Double-check that all slings are firmly connected and that the entire package is in good condition before starting any handling operations.



4.1.2 Handling using a forklift

- Use only a suspended and secured lifting crossbar with short slings.
- The boxes must be suspended by the upper lips on either end of the box.
- You may not handle and move the boxes on the lifting forks.



4.1.3 Handling using a special multidirectional forklift

- A multidirectional forklift must have a special securing system to handle boxes on the forks in the vertical position. A cap is used to secure the box and prevent it from tilting.

4.2. Handling loose packs

Loose packs are handled using lifting equipment with a special crossbar and slings:

The crossbar with slings lets you set the space between the slings precisely according to the length of the pack being moved and the exact thickness of the pack.

- Steel U-profile bases are then attached to the bottom of the slings using a simple system adjusted to the thickness of the pack.
- A crank mechanism lets you set the thickness of the pack on both lips of the crossbar.
- The operator should gently insert the steel U-profile bases under the pack and only then slightly move the whole pack up.
- This type of handling should not be used for packs that are:
  - less than 5 cm thick and less than 161 cm high;
  - contains glass sheets less than or equal to 3 mm thick and less than 185 cm high.

4.3. General guidelines

- Suction pads must be perfectly clean.
- Any direct contact with hard materials must be avoided.
- Suction pad lifting beams and other hoisting equipment must comply with prevailing regulations and be approved by the relevant authorities.
- Personnel must check that the suction pads are adhering correctly before any further manipulation.
- Ensure the personnel safety at all times. Keep all unnecessary personnel out of the handling area. Wear appropriate personal protective equipment.
- Personnel must have received the appropriate training.
- You should always handle one pack at a time.
- You should always space the slings on the crossbar according to the thickness of the pack.

5. UNLOADING

5.1. Unloading boxes

- The truck trailer must be parked on even ground (road).
- If the products are unloaded from a container, the trailer’s support legs must be extended.
- Before the binding straps are cut you must check that the products have been placed at a safe angle (6°). If necessary, use metal rods with a tip to secure the pack and prevent any tilting.
- Individual boxes are removed from A-stand with slings (steel chains, wire ropes, webbing belts) and suspended from lifting equipment.
- Individual boxes are removed alternately from the left side and right side so that the trailer does not overturn. It is strictly prohibited to unload from one side first and only then from the other.
- On the top of the last pair of boxes on the transport racks there are wooden planks that must be removed before those boxes are handled.

- When removing the last box from the rack the operator much check if the rack has stabilising rack braces or a clamping rod. If there are no stabilising elements on the rack, then the operator must secure its position and once the box is removed, the operator needs to lay it down on the loading platform of the truck.

5.2. Unloading packs

- The truck trailer must be parked on even ground (road).
- Before the operator starts to unload the glass, he must make sure that the 13-tonne A-frame folding bars are secure. This security system is never removed before handling loaded racks.
- If a 13-tonne crane is used for unloading glass, you can use a hoist to unload the whole rack. The rack is attached to the hooks on the hoist.
- If individual packs are unloaded, you must handle them using a special crossbar with slings (see *Handling with a special crossbar with slings*).

5.3. General guidelines

- Slinging and handling loads with lifting equipment are subject to applicable standards and regulations for lifting equipment.
- Before starting any handling operations, you must check the quality of the package (pack), load capacity of the crane, and the load capacity and length of all the slings.
- Only a properly qualified person with a valid crane operator and slinger licence may sling and handle loads.
- Once the wooden securing elements are removed, you must not drive any protruding nails back into the packaging, but must instead pull them out.

6. CUTTING

Below are several recommendations that should be followed when cutting Imagin glass:

- The cut must be lubricated using a volatile oil that is easy to wash off.
- The cut must be made on the non-patterned side. In the event of double-sided patterns you must cut on the side with the more delicate pattern and must always properly adjust the cutting pressure (it should be slightly higher).
- When cutting Imagin Wired glass you must be careful when splitting the pane. You must not split it in one go, like you do with patterned glass. You need to break it off gradually in gentle motions, going up and down a few times in a row. Otherwise you may cause chipping along the split line. When cutting smooth unpatterned wired glass this phenomenon is less significant.

However, cutting laminated patterned glasses is a more intricate process and it is important that the following rules be observed:

- Place the sheet of glass with the patterned side facing upwards.
- Cut the underside (float) only.
- Next cut the uppermost side (patterned glass) using plenty of oil.
- Move the sheet to break it off manually.
- Break off the underside (float) by lifting the sheet.
- Then break off the uppermost side (patterned glass) by pressing down on the sheet.
- Cut the PVB interlayer with the cutter or place the sheet over the table's heating element.

6.1. Working conditions

- Cutting personnel must wear clean gloves.
- All tools, conveyors, etc. that might come into contact with the glass must be kept clean.
- When using templates, special care must be taken to ensure that the templates are clean.
- The manipulation with suction pads (both hand operated or machine operated) has to be done on smooth (non-patterned side). Suction pads have to be clean.

7. WASHING

Imagin glazings must be washed with clean water. A small quantity of a mild detergent solution which does not contain any abrasives or acids (specifically chlorine, fluorine or alkalis) may be mixed into the water.
Before washing theglass, make sure to remove all residue and particles that could scratch the surface of the glass (grains of sand, glass splinters, iron oxides, etc.).
If the glazings are washed in an automatic machine it is important to regularly check the wash water as well as the cleanliness and hardness of the brushes in the washing machine so as to prevent the build-up of abrasives. Doing so will help prevent any damage to the surface of the glass.
Glass must be dried immediately after washing and must be dried thoroughly. AGC recommends regularly checking the filtration quality of the air used to dry theglass.
If you are further processing patterned glass (tempering etc.), please use only clean panes of glass, without any residue left from cutting, grinding or storage.

Always use plenty of clean water to initially wash patterned glass after it has been polished on vertical and horizontal grinders.

You should not wash Imagin wired glass in automatic washers because the water may penetrate the glass where the wire protrudes, which may in turn cause the wires to corrode on the edges of the pane.

8. QUALITY CONTROL

Before sending Imagin glass to the assembly station, AGC recommends performing a visual inspection of the glass transmission and reflection.
The transmission check should be performed against an artificial white sky background. The reflection check should be carried out against a black background.
See also standard EN 572-5.

9. ASSEMBLY IN DOUBLE GLAZING

Imagin glazings can be assembled in insulating glazing. First, however, the glazing must be thoroughly rinsed and dried to prevent any traces of drops on the glass.
The patterned side must face the outside of the glazing unit. For some shallower designs the patterned side may face the air space. In this case, it is important to ensure that the butyl seal and sealing compounds adhere securely.

10. TOUGHENING

Some Imagin glazings can be toughened depending on the design and thickness(see AGC Imagin Info sheets on www.agc-yourglass.com). Below are several recommendations that should be followed during the toughening process:

- The glazings must be shaped before being toughened.
- The glazings must first be thoroughly washed and dried.
- Prior to toughening, markings (such as a quality label) can be applied to the side of the glass that is not in contact with the rollers in the toughening furnace. First check compatibility with and adhesion to the glass.
- AGC recommends placing the sheets in the toughening furnace so that ultimately they are oriented in the same way on-site. The base of the sheet is generally parallel to the rollers in the toughening furnace.
- AGC recommends conducting tests prior to starting the process.
- The patterned side must not come into contact with the rollers in the toughening furnace.

10.1. Working conditions

- Toughening personnel must have received the required training and must wear clean gloves.
- All tools, rollers, etc. that might come into contact with the glass must be kept clean.

11. LAMINATION

Some Imagin glazings can be laminated. First, however, the glazing must be thoroughly rinsed and dried to prevent any traces of drops on the glass.
In this case, AGC recommends using a PVB interlayer of at least double the thickness (0.76 mm) and ensuring that the patterned side faces outwards.

12. CURVING

Some Imagin glazings can be curved. Below are several recommendations that should be followed during the curving process:

- Check that the settings of the bending oven are correct for this type of glass.
- The glazings must first be shaped along all edges.
- The glazings must first be thoroughly washed and dried so that both sides of the glass are free of any residue (oil, fingerprints, etc.) and particles (grains of sand, pieces of glass, iron oxides, etc.).
- Any markings (such as a quality label), silkscreen printing and enamelling must be applied to the glass prior to bending. They must be applied to the side of the glass that is not in contact with the templates used for bending the glass. The ink used must be chemically compatible with this type of glass.
- The patterned side of the glazing must not come into contact with the bending templates.

12.1. Working conditions

- Glass-bending personnel must have received the required training and must wear clean gloves.
- All tools, rollers, etc. that might come into contact with the glass must be kept clean.

13. ENAMELLING / SILKSCREEN PRINTING

Some Imagin glazings can be enamelled. Below are several recommendations that should be followed during this process:

- Check that the settings of the bending oven are correct for this type of glass.
- The glazings must first be shaped along all edges.
- The glazings must first be thoroughly washed and dried so that both sides of the glass are free of any residue (oil, fingerprints, etc.) and particles (grains of sand, pieces of glass, iron oxides, etc.).
- Any markings (such as a quality label), silkscreen printing and enamelling must be applied to the glass prior to bending. They must be applied to the side of the glass that is not in contact with the templates used for bending the glass.
- The ink used must be chemically compatible with this type of glass.
- Only the non-patterned side of the glazing will be enamelled.

13.1. Working conditions

- Enamelling personnel must have received the required training and must wear clean gloves.
- All tools, rollers, etc. that might come into contact with the glass must be kept clean.

14. NOTES

Recommended gloves
Product description: HYD TUF 52-547 (glove size 8-10 for handling coated glass)
Supplier: IMPEXACOM
Rue des Tourterelles 14-16 B -5651 Thy le Château - Belgium
Tel.: + 32 71 612145 Fax: + 32 71 612164

Recommended cutting oil
Product description: Cutting Oil Sogever 1100 FG
Supplier: SOGELUB
Rue de la Terre à Briques, B-7522 Marquain - Belgium

Recommended spacer for storing the glass
Product description: cork discs with foam (self-adhesive) (3x20x20 mm)
Supplier: VITO IRMEN
Mittelstrasse 74-80 - D-53407 Remagen - Germany
Tel.:+ 49 26 42 40 07 10 Fax:+ 49 26 42 42 913

Recommended packing foam
Product description: 1 mm packing foam
Supplier: SCRIPHORIA
Wellen - Belgium Tel.: + 32 11 370 111

15. DISCLAIMER

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