



GLASS UNLIMITED

PROCESSING GUIDE

OLTRELUCE

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**Revised information on products, product availability and processing guidelines is regularly updated on the AGC Glass Europe website
www.yourglass.com**

TABLE OF CONTENTS

1. Packaging	3
2. Unloading	3
a. Bulk packaging	3
b. Packaging on frames	3
c. Packaged in wooden endcaps	3
d. Packaged in wooden boxes	4
e. General notes	4
3. Storage	4
4. Handling	5
5. Cutting.....	5
6. Processing	7
7. Washing	7
8. Quality control before assembly or shipment.....	8
9. Assembly in Insulating Glass Unit	8
10. Toughening.....	8
11. Lamination	9
12. Bending	9
13. Enamelling / Silkscreen printing	10
14. Initial cleaning after installation, routine/special maintenance	11

1. Packaging

Oltreluce patterns (Waves, Space & Circles; with or without silver backing) are available in standard sizes 335x185 or 321x185 cm for silver backing (in bulk, A or L frames, wooden cases & end caps). The glass sheets are separated by a powder interlayer. The exact contents of each package is indicated on the label fixed to the edge of the pack or packaging.

2. Unloading

a. Bulk packaging

- The trailer must be positioned on perfectly level ground;
- Release the straps and blocks;
- Use the appropriate clamp or sling;
- Handle one pack at a time;
- The clamp must be perfectly centred;
- The slings must be positioned under the pack, at the ends. The angle between the slings must be no more than 90°;
- Use protective materials in those areas where there is contact with the glass.

b. Packaging on frames

- The trailer must be positioned on perfectly level ground;
- Release the blocks;
- The posts must NOT be opened at this stage;
- Use appropriate lifting beam or double lifting beam;
- Check that the glass is correctly centred on the frame before lifting.

c. Packaged in wooden endcaps

- The trailer must be positioned on perfectly level ground;
- Release the straps and blocks;
- The strapping on the endcaps themselves must NOT be cut at this stage;
- Use slings or an appropriate lifting beam;
- The slings must be positioned under the upper or lower ends of the endcap;
- The angle between the slings must be no more than 90°.

d. Packaged in wooden boxes

- The trailer must be positioned on perfectly level ground;
- Release the straps and metal blocks;
- Use slings or an appropriate lifting beam;
- The slings must be positioned under the upper of the box;
- The angle between the slings must be no more than 90°.

e. General notes

- Clamps, slings, lifting beams and other hoisting equipment must comply with prevailing regulations and be approved by the relevant authorities;
- Ensure the safety of personnel at all times. Keep all unnecessary personnel out of the handling area. Wear appropriate personal protective gear;
- Personnel must have received the appropriate training.

3. Storage

Upon receiving orders, check the condition of each pack of glass carefully and indicate any breakages, moisture, humidity or any serious defects either to the carrier – who must record your observations and the appropriate documentation on the CMR document – or to the AGC representative or directly to the AGC Customer Care Center. This must be done within 7 days of receipt.

Correct storage helps prevent deterioration caused by the following hazards:

- chemicals: surface defacement caused by water, moisture or condensation;
- mechanical hazards: surface accidents, breakage, etc.

As a general rule, AGC recommends never storing products outside and ensuring proper rotation of stored glass sheets (FIFO).

Ideal storage areas are covered (out of sunlight) and well ventilated to prevent the risk of thermal stress. AGC recommends maintaining a temperature of between 15 and 25 °C and a relative humidity of less than 80%. Glass showing signs of moisture due to temperature fluctuations during transport must be dried or installed as soon as possible.

For Oltreluce Silver, storage must be away from sources of heat and corrosive materials or agents such as organic solvent vapors, chemicals, acids or fuel.

4. Handling

- Labels and/or tape on the edge of the pack must be removed before handling glass sheets;
- Glass sheets must be lifted with a suction pad lifting beam or with an automatic unloading machine, the lifting beam must be properly centered ;
- Suction pads must be perfectly clean ;
- Suction pads must preferably be used on smooth side (non-patterned side), else adapted suction pads must be used on the patterned side (pads equipped with neoprene foam);
- Suction pad lifting beams and other hoisting equipment must comply with prevailing regulations and be approved by the relevant authorities ;
- Any direct contact with hard materials must be avoided ;
- Care must be taken to prevent scratches by ensuring that the edge of a glass sheet does not rub against the surface of another glass sheet;
- Ensure the safety of personnel at all times. Keep all unnecessary personnel out of the handling area. Wear appropriate personal protective gear ;
- Personnel handling glass must check that the suction pads are adhering correctly to the glass sheet before any further manipulation (check appropriate vacuum level);
- Personnel handling glass must have received the required training.

5. Cutting

Below are several recommendations that should be complied with when cutting Oltreluce glass sheets:

- Cutting should be carried out on the smooth side, thus for Oltreluce Silver through the paint;
- The cut must be lubricated following the rules for glass cutting with a product easy to wash off, we advise Aachener Chemische Werke "Acecut 5503 or Acecut 6000" for cutting oil;
- Cutting can give good results with following parameters as a guidance:
 - "Easycut" double wheel angle 60°/ 125° or normal wheel angle 115°;
 - Pressure of 2 bar;
 - Speed of 65 m/min;
- Cut sheets must be separated by a glass breaking plier.



For Oltreluce Silver, it is important to follow the below rules:

- Oltreluce Silver must be cut through the paint using AGC's 'Easycut' system which cuts directly through the paint and the cast glass. For more information, please contact your nearest AGC Glass Europe sales agent.
- Cutting can give good results with following parameters as a guidance:
 - 4mm Oltreluce Silver
 - "Easycut" double wheel angle 60°/ 120°
 - Pressure: 48/50N (in general 2 to 3 times higher pressure);
 - Reduced cutting speed of 45-50 m/min;
 - 6mm Oltreluce Silver
 - "Easycut" double wheel angle 60°/ 115°
 - Pressure: 56/58N (in general 2 to 3 times higher pressure);
 - Reduced cutting speed of 45-50 m/min;
- The cutting and transfer tables must be covered with felt and cleaned frequently to avoid scratches caused by small glass splinters that could damage protective lacquers and varnishes;
- Use small quantities of neutral cutting oils, such as oil produced by Aachener Chemische Werke "Acecut 5503" or MKU Chemie "Dionol GT 630";
- Avoid scratching the coating when packing or storing the cut sheets. The use of spacers is recommended. Use soft spacers e.g. wood powder, but avoid organic products such as Lucite beads, as they can scratch the painted backside. When shrink-wrapping, perforated plastic may be used if the glass is to be stored in a dry area for a normal length of time.

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 upper 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 or EVA interlayer with the cutter or place the sheet over the table's heating element;
- We advise not cutting Oltreluce Waves pattern after lamination process, lamination must be done in the required final product dimension.

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.

6. Processing

Oltreluce glass sheets can be grinded, edge treated and drilled.

- Processing quality depends on clean cutting.
- Adjust the speed of the processing machine according to the number of grinding wheels fitted to the machine and the thickness of the glass.
- If using spherical grinding wheels, avoid overly angular shapes. It is advisable to use 1 type of grinding wheel per thickness of glass.
- If treating a flat joint with arrissed edges, avoid edges with an angle greater than 145°.
- Treatment on the lacquered side of Oltreluce Silver must be smooth and free of glass shards to prevent the risk of corrosion of the silver layer.
- Use non-abrasive coolant oils (neutral pH) to prevent damage being caused to the Oltreluce Silver coatings.
- Wash processed products immediately, preferably with deionized water, and dry carefully.
- Use appropriate spacers when stacking processed products.

7. Washing

Oltreluce glass sheets must be washed with clean water, preferably with deionized 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 the glass sheets, 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 glass sheets are washed in an automatic machine it is important to check regularly 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 sheets must be dried immediately after washing especially around the edges and must be dried thoroughly. AGC recommends regularly checking the filtration quality of the air used to dry the glass sheets.

8. Quality control before assembly or shipment

AGC recommends carrying out a visual inspection. The transmission check should be performed against an artificial white sky background. The reflection check should be carried out against a black background.

9. Assembly in Insulating Glass Unit

Oltreuce glass sheets (without silver backing) can be assembled in insulated glazing units (IGU). First, however, the glass must be thoroughly rinsed and dried to prevent any traces of drops on the glass. In general, the patterned side must face the outside of the IGU.

However, for Oltreuce Space and Circles pattern, the patterned side can also face the air space (inside of the IGU). It is always important to ensure that the butyl seal and sealing compounds adhere securely. We advise to use silicone (DC3362 Dow Corning) in place of polyurethane in order to get high adhesion.

10. Toughening

Oltreuce glass sheets Circles and Space can be toughened. Oltreuce Waves cannot be toughened due to the depth of the pattern. Oltreuce Silver cannot be toughened due to the silver coating and the organic paint coatings. Below are several recommendations to comply with during the toughening process:

- The glass sheets must be cut and edge treated before being toughened;
- The glass sheets 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;

In the below table, you can find some advices for toughening of Space and Circles patterns.

Glass Product	Pattern position	Oven heating time	pressure or ventilator speed	Quench	
				pressure balance top (%)	pressure balance bottom (%)
Float Clear (as a reference)	--	100	100	0	0
Circles Clear	UP	120	100	0	+20
	DOWN	120	100	+20	0
Space Clear	UP	120	100	0	+5
	DOWN	120	100	+5	0
Circles Clearvision	UP	130	100	0	+20
	DOWN	130	100	+20	0
Space Clearvision	UP	130	100	0	+5
	DOWN	130	100	+5	0

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

Oltreuce glass sheets (without silver backing) can be laminated. First, however, the glass sheets must be thoroughly rinsed and dried to prevent any traces of drops on the glass. AGC recommends using 4 PVB interlayers (1.52 mm) or 3 layers of EVA and ensuring that the patterned side faces outwards. For the Waves pattern, PVB or EVA lamination must be carried out on the final cut sizes to avoid cutting problems. Cutting of laminated Waves can lead to unwanted shells.

For Oltreuce Silver, SAFE film can be applied manually on cut size.

12. Bending

Oltreuce glass sheets (without silver backing) can be curved. Below are several recommendations to comply with during the curving process:

- Check that the settings of the bending oven are correct for this type of glass;
- The glass sheets must first be edge processed along all edges;
- The glass sheets 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 glass must not come into contact with the bending templates.

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

Oltreluce glass sheets (without silver backing) can be enamelled. Below are several recommendations to comply with during this process:

- Check that the settings of the oven are correct for this type of glass;
- The glass sheets must first be edge processed along all edges;
- The glass sheets 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.

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. Initial cleaning after installation, routine/special maintenance

- Oltreluce cast glass and Oltreluce Silver can be cleaned using modern cleaning products.
- However, ammonia-based cleaning products or other abrasive products, such as anti-limescale products, must never be used.
- Oltreluce Silver must be dried immediately after cleaning, especially around the edges.