



**AGC**

# LUXCLEAR PROTECT

## PROCESSING GUIDE

VERSION 1.0 – APRIL 2018

Your Dreams, Our Challenge

This version of the guide replaces and cancels all previous versions.  
Please regularly check [www.agc-yourglass.com](http://www.agc-yourglass.com) for any updates.

# CONTENTS

1. RECEPTION AND STORAGE .....	4
1.1 Unloading .....	4
1.2. Storage of the packs.....	4
1.3. Coating side detection .....	4
2. PROCESSING .....	5
2.1. Safety .....	5
2.2. Cutting .....	5
2.3. Edge processing.....	5
a) Handling the glass.....	5
b) Shaping the edges .....	6
c) Unloading .....	6
2.4. Washing .....	6
2.5. Silk-screen printing and enamelling.....	6
a) Generalities .....	6
b) Precautions for enamel on the coated side .....	7
c) Precautions for enamel on the glass side .....	7
d) Quality Control.....	7
e) Performances of the enamel glass .....	7
2.6. Thermal toughening.....	7
a) Introduction .....	7
b) Recommendations .....	7
c) Settings .....	8
d) Unloading .....	8
e) Heat Soak test.....	8
f) Quality Control .....	8
g) Packaging .....	8
2.7. Bending .....	9
2.8. Storage of cut sizes .....	9
a) During processing in the same factory .....	9
b) To send cut size to another factory .....	9
c) On-site.....	9
3. CONFORMITY AND GUARANTEE .....	10
3.1. Conformity .....	10
3.2. Warranty .....	10
3.3. CE Marking.....	10
3.4. Disclaimer.....	10

## 1. RECEPTION AND STORAGE

### 1.1 Unloading

The packs of glass must be inspected on arrival. AGC shall accept no liability for faults arising after delivery or during handling, processing or installation of the finished product in the building if this procedure is not followed:

- The rack must be positioned on perfectly level ground
- Use the appropriate handling equipment
- The grab must be perfectly centered
- Avoid damaging the protective packaging whilst handling
- The glass must be stored on appropriate racks
- All recommendations given in this Processing Guide shall be strictly followed.

#### **General comments:**

- Clamps, slings, lifting beams and other handling 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 equipment.
- Personnel must have received the required training.

### 1.2. Storage of the packs

Storing packs correctly reduces the risk of chemical or mechanical damage to the glass.

As a general rule, care should be taken to avoid major fluctuations in temperature and humidity that may cause condensation on the glass. Such fluctuations generally occur near loading and unloading areas. No water must be allowed to come into contact with the sheets of glass.

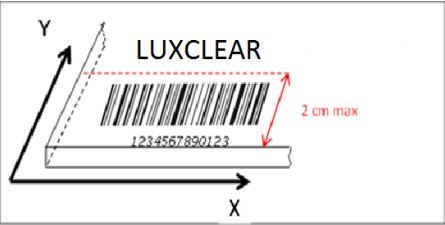

Care should be taken to ensure that the ambient air is not polluted by any corrosive elements such as chlorine or sulphur. Sources of such elements include machinery fitted with heat engines, battery-charging points, road salt on the ground and so forth.

Factory racks are used for packaging during transport and are not designed to be used for storage. Consequently, the PLFs must be stored on racks with spacers between packs ensuring that all packs of the same size are stored together.

### 1.3.Coating side detection

Luxclear Protect is a non-conductive coating and cannot be detected by conventional means. During manufacturing and packaging the coated side of Luxclear Protect is always oriented in the same direction. The coating is on the score side of the glass and the AGC case tag indicates which way the score side is oriented in the package. "LUXCLEAR" is also printed once on each Luxclear Protect sheet (DLF or PLF) at a distance of 2 cm from the corner with washable inkjet. Another method for determining the coated side is that the coating is always opposite the tin side of the glass. Furthermore, Luxclear Protect Coating Detectors are available from the AGC webshop at [www.agc-store.com](http://www.agc-store.com).



		
Luxclear Protect washable inkjet	AGC Luxclear Protect Detector	AGC Luxclear Protect Stickers to be applied by processors

## 2. PROCESSING

### 2.1. Safety

At each stage of the processing procedure, the personnel responsible for handling the glass must have the adequate equipment: safety shoes, safety gloves<sup>1</sup>, safety glasses, etc.

### 2.2. Cutting

The following specific precautions must be taken when cutting:

- the coated side must be facing upwards to avoid any contact between the coating and the surface of the table
- Luxclear Protect can be handled with suction cups. The cups must be clean and dry to prevent damage to or marking of the coating. The cups should not be slid across the coated surface.
- The cutting oil used should be compatible with the coating, sufficiently volatile and water soluble<sup>2</sup>
- The table and any breaking equipment liable to come into contact with the coating on the glass must be pre-validated.
- Cutting will be the same as for clear uncoated glass of the same thickness. No special cutting wheels are needed.

After cutting, when the glass is stored on racks, no particular spacer is needed if the original interlayer powder is still present. However, if for any reason there is not enough interlayer powder left on the glass, we recommend that you place cork spacers between the sheets<sup>3</sup>. The same recommendations apply for packs with several glass dimensions

Luxclear Protect does not have to be edge-deleted.

### 2.3. Edge processing

Luxclear Protect is designed to undergo thermal toughening, if needed. Accordingly, the edges of the glass must be shaped.

#### a) Handling the glass

The personnel responsible for handling and shaping the edges of the glass must wear safety gloves.

## b) Shaping the edges

All edge-processing machines available on the market are in principle suitable for Luxclear Protect:

- Crossed belt system
- Vertical single edging system
- Horizontal double edging system
- Numerical Control Systems (CNC)

During shaping, the coated side must be facing upwards.

## c) Unloading

Due to the fact that the interlayer powder is removed during the washing process, we recommend placing micro-suction pads<sup>3</sup> around the edge of each sheet of glass in order to prevent contact between the glass and the coatings. Paper with a neutral pH can also be used, for example, for large volumes.

## 2.4. Washing

This stage involves washing, rinsing and drying the glass.

If the glass is fitted with hard brushes (> 150 µ), it is important not to stop the cycle whilst the glass is in the washing machine.

Always run coated side up.

There is no special recommendation regarding the quality of the water. Nevertheless, the PH of the water in the washer and in the edge-processing machine should be between 6 and 8.

In each case, the glass has to be perfectly clean after the washing, in order to avoid any pollution of the tempering furnace rollers.

After washing, micro-suction pads<sup>3</sup> should be used between the glasses.

### **Quality Control**

The coated glass must be inspected after the washing. Some halogen lights should be installed above the glass, in order that the operator will be able to see the lights reflected by the coating, when the glass is coming out of the washer.

## 2.5. Silk-screen printing and enamelling

### a) Generalities

The following limitations apply for the silk-screen printing and the enamelling

	Enamel on glass side	Enamel on coated side
Luxclear Protect	OK	OK*
*Appearance, as indicated below in point b, absolutely must be validated.		

## **b) Precautions for enamel on the coated side**

Luxclear Protect can generally be used for silk-screen printing on either the coated or uncoated side as long as the instructions below are followed.

Any impurities on the surface can be removed using a compressed dry-air jet.

In each case, the final result will depend on the type of furnace used, its parameters, the colour and type of enamel used and the desired pattern. The processor will have to carry out preliminary tests, on a case by case basis, to validate the visual result and the mechanical and chemical properties of the enamelled glass. We recommend producing a mock-up for the final aesthetic approval.

## **c) Precautions for enamel on the glass side**

Luxclear Protect can generally be used for silk-screen printing on the glass side, just like normal float glass.

The presence of the coating on the bottom side will not affect the behaviour of the glass in the furnace. The use of SO<sub>2</sub> in the furnace has no negative effects on the coating.

The top and bottom convection pressure profiles, when used, shall be fine-tuned in order to keep the glass flat in the tempering furnace, from the early stage until the end of the heating process. The same approach for the heating profile, when no convection is used.

## **d) Quality Control**

The coated glass must be inspected after the silk-screen printing. To do so, some halogen lights should be installed above the glass, in order that the operator will be able to see the lights reflected by the coating after the silk-screen printing.

## **e) Performances of the enamel glass**

The presence of enamel on the coating changes the optical properties of the final glass product. These performance properties can be obtained from our Technical Advisory Service ([tas@eu.agc.com](mailto:tas@eu.agc.com)).

## **2.6. Thermal toughening**

### **a) Introduction**

Luxclear Protect has the same normal emissivity as a float glass (normal emissivity = 0.89). All tempering furnaces available on the market can be used to thermally treat this product.

### **b) Recommendations**

The personnel handling the glass must wear safety gloves<sup>1</sup>.

The following options are possible for the position of the coating and the convection in the furnace.

	Coating position in the furnace		Type of convection	
	Upwards	Downwards*	Convection top**	Convection bottom**
Luxclear Protect	OK	OK	Allowed	Allowed
* The rollers of the furnace as well as the quench and conveyors systems must be kept clean ** The top and bottom convection pressure profiles, when used, must be fine-tuned in order to keep the glass flat in the tempering furnace, from the early stage till the end of the heat treatment. The same approach for the heating profile, when no convection is used.				

Tempering markings may be made before heat treatment on the upper side of the glass.

### c) Settings

Luxclear Protect must be thermally toughened using the same settings as the uncoated glass substrate.

### d) Unloading

- If the glass is unloaded manually, the personnel must wear safety clean gloves<sup>1</sup>.
- Larger and heavier sheets should be handled with a suction-pad lifting beam.
- Given that toughened glass sheets are never perfectly flat, micro suction pads<sup>3</sup> should be placed around the edge of each sheet of glass in order to prevent contact between the glass and the coatings.

### e) Heat Soak test

For thermally toughened glass, the risk of spontaneous breakage due to nickel sulphide is not covered by AGC Glass Europe. If necessary a Heat Soak test can be carried out in accordance with standard EN 14179-1 (or equivalent standards for countries out of the EC).

Interlayer's should only be placed on the perimeter of the glass.

### f) Quality Control

The properties of Luxclear Protect are not altered during heat treatment (tempering, bending and heat soak).

After the thermal toughening process, Luxclear Protect should be inspected as follows:

- The coating is inspected in accordance with EN 1096-1\*
- Thermally toughened safety glass must comply with EN 12150-1\*
- The eventual Heat Soak Test (HST) must be carried out in accordance with EN 14179-1\*

\* Or equivalent local standards for countries out of the EC

### g) Packaging

If Luxclear Protect is to be delivered to another factory in cut sizes, the following recommendations for packaging must be followed:

- A 1 mm-polyethylene foam spacer should be placed between each sheet<sup>4</sup>
- Care must be taken to ensure that the pack is properly attached to the rack so that the sheets do not rub together.



## 2.7. Bending

Luxclear Protect can be curved or curved and heat treated with the same furnace settings as used for the glass substrate.

In order to limit the risk of breakage in the furnace (annealed curved version) or in the quench section (tempered curved version), AGC recommends smooth-edge processing the glass.

In all cases, the coating can be in compression or tension. It is thus allowed to produce “S – shaped” curved glass.

## 2.8. Storage of cut sizes

### a) During processing in the same factory

After each processing step, when the glass is stored on racks, no particular spacer is needed if the original interlayer powder is still present. If for any reason there is not enough interlayer powder left on the glass, and particularly after the washing, we recommend that you place cork spacers between the sheets<sup>3</sup>. The same recommendations apply for packs with several glass dimensions.

The storage must be conform to the recommendations of § I.2

### b) To send cut size to another factory

If Luxclear Protect has to be delivered from the processing factory to another factory, the following recommendations for packaging must be followed:

- A 1 mm-polyethylene foam spacer should be placed between each sheet<sup>4</sup>
- Care must be taken to ensure that the pack is properly attached to the rack so that the sheets do not rub together
- The pack of glass should be packaged in watertight plastic. Sachets filled with desiccating agent should be placed inside the packaging

### c)

### d) On-site

When the glazing is delivered on-site to be installed, it must be stored in a dry, sheltered and ventilated space. It must never be laid flat, nor stored in the sun or near a heat source.

## 3. CONFORMITY AND GUARANTEE

### 3.1. Conformity

Luxclear Protect complies with standard EN 1096-1, category A.

Information regarding inspection conditions and quality criteria are available in that standard.

### 3.2. Warranty

The warranty is available on [www.agc-yourglass.com](http://www.agc-yourglass.com).

### 3.3. CE Marking

Any relevant information and declarations pertaining to the CE mark for Luxclear Protect can be found at [www.agc-yourglass.com/CE](http://www.agc-yourglass.com/CE).

### 3.4. Disclaimer

It is the responsibility of the processor to inspect the processed coated glass adequately before and after each step of fabrication and prior to installation. Failure to apply all professional standards, customary instructions and processing instructions written in this processing guide and related links will automatically void any warranty regarding coated glass of AGC. We advise the processor to undertake some preliminary trials with the typical glass compositions for the project prior to any further commitment with his customer. The processor is solely responsible for the quality of the final product.

## 4. NOTES

#### <sup>1</sup> **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

#### <sup>2</sup> **Recommended cutting oil:**

Product description: ACPE 5503 cutting oil Supplier: ROLAND Rue de la Petite Ile 4 B – Brussels -Belgium  
Tel.: + 32 2 5250618 Fax: + 32 2 5200856

#### <sup>3</sup> **Recommended spacer for storing the glass**

Product description: Cork disks with micro suction pads (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

#### <sup>4</sup> **Recommended packing foam:**

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