



**AGC**

# PLANIBEL EASY CLEAR PLANIBEL EASY BLUE PROCESSING GUIDE

VERSION 1.0 - DECEMBER 2017

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

0. PRODUCTS .....	4
I. RECEPTION and STORAGE .....	4
1. Unloading .....	4
2. Storing the packs.....	5
II. PROCESSING .....	6
1. Safety .....	6
2. Cutting .....	6
3. Shaping.....	6
2.1 <i>Handling the glass</i> .....	6
2.2 <i>Shaping the edges</i> .....	6
2.3 <i>Unloading</i> .....	7
3. Washing.....	7
4. Silkscreen printing and enamelling .....	7
4.1 <i>General</i> .....	7
4.2 <i>Precautions that must be taken when enamelling the coated side</i> .....	8
4.3 <i>Precautions that must be taken when enamelling the glass side</i> .....	8
4.4 <i>Quality control</i> .....	8
4.5 <i>Performance of enamelled/silkscreen printed glass</i> .....	8
5. Thermal toughening/Heat-strengthening.....	8
5.1 <i>Introduction</i> .....	8
5.2 <i>Recommendations</i> .....	9
5.3 <i>Settings</i> .....	9
5.4 <i>Unloading</i> .....	9
5.5 <i>Heat soak test</i> .....	9
5.6 <i>Quality control</i> .....	9
5.7 <i>Packaging</i> .....	10
6. Bending.....	10
7. Lamination .....	10
8. Use in single glazing .....	11
9. Assembly in insulating glass units .....	11
10. Storage of cut-sizes/IGUs .....	12
10.1 <i>During processing in the same factory</i> .....	12
10.2 <i>Sending cut-sizes to another factory</i> .....	12
10.3 <i>On-site</i> .....	12
III. CONFORMITY and WARRANTY .....	13
1. Conformity .....	13
2. Warranty .....	13
3. CE Marking .....	13
4. Disclaimer .....	13
IV. GLAZING INSTRUCTIONS .....	13
AGC's glazing instructions are available at <a href="http://www.yourglass.com">www.yourglass.com</a> . .....	13
V. CLEANING THE FACADE .....	13
Instructions for cleaning glass installed in facades are available at <a href="http://www.yourglass.com">www.yourglass.com</a> . ...	13
VI. NOTES .....	14

# 0. PRODUCTS

This Processing Guide applies to the following products:

Planibel Easy Clear and Planibel Easy Blue.

These products incorporate a pyrolytic coating applied online via chemical vapour deposition (CVD) to the air side of the float glass on Planibel Clearlite and Planibel Dark Blue.

This is a Class A coating as per standard EN1096 delivering excellent mechanical and chemical specifications.

These two products are for external use only and are intended for residential and commercial markets. The coating must always be in position 1 (i.e. facing towards the exterior of the building), making it possible to significantly reduce the frequency of cleaning.

AGC strongly recommends complying strictly with the following processing instructions for these products.

## I. RECEPTION and STORAGE

### 1. Unloading

Planibel Easy Clear and Planibel Easy Blue are available in 4 and 6 mm thicknesses and in the following sizes: 600 x 321 cm (PLF), 255 x 321 cm (DLF) and 225 x 321 cm (DLF).

The packs of glass must be inspected upon arrival. AGC will 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 centred.
- Avoid damaging the protective packaging whilst handling.
- The glass must be stored on appropriate racks.
- All recommendations given in this Processing Guide must be followed strictly.

#### *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.

## 2. Storing 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 contaminated by any corrosive elements such as chlorine or sulphur. Such elements can come from machinery fitted with heat engines, battery-charging points, road salt on the ground and so forth.

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

## II. PROCESSING

### 1. Safety

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

### 2. Cutting

The following specific precautions must be taken when cutting:

- The coated side must be face-up to avoid any contact between the coating and the surface of the table.
- 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.

After the cutting step, when the glass is stored on racks, no spacers are needed if the original interlayer powder is still present. If for any reason whatsoever there is not enough interlayer powder left on the glass, we recommend that you place self-adhesive foam cork pads between the sheets<sup>3</sup>. The same recommendations apply to packs containing sheets of differing sizes.

Determining which side the coating is on: use a blacklight to determine which side is the tin side. The coating is on the other side.

The sheets of glass will be identified (using labels, chalk marks, etc.) on the tin side, i.e. the side opposite the coating.

### 3. Shaping

Planibel Easy Clear and Easy Blue are designed to undergo thermal processing (tempering or heat-strengthening), where appropriate. Prior to such processing, the edges of the glass must be shaped.

#### 2.1 Handling the glass

Personnel responsible for handling and shaping the edges of the glass must wear clean safety gloves.

#### 2.2 Shaping the edges

All edging machines available on the market are appropriate for use with Planibel Easy Clear and Easy Blue, provided they are kept sufficiently clean.

Crossed-belt system  
Straight vertical system  
Horizontal double-edging system  
Computer numerical control (CNC) system

During edging, the coating must be placed face-up in horizontal systems, and facing the operator in

vertical systems.

Drilling operations can also be performed, applying the same conditions as described above.

### 2.3 Unloading

Since the interlayer powder is removed during the washing process, we recommend placing self-adhesive foam cork pads<sup>3</sup> around the edges of each glazing unit to prevent contact between the glass and coating. A sheet of pH-neutral paper can also be used for large units.

## 3. Washing

This stage involves washing, rinsing and drying the glass.

The coating must be placed face-up.

If the glass is washed using hard brushes (> 150 µ), it is important not to stop the cycle while the glass is in the washer.

The pH of the water in the washer and the edge-processing machine must be between 6 and 8.

In all cases, the glazing must be perfectly clean after washing in order to prevent the tempering furnace rollers from becoming contaminated.

If the coating of the glass must be re-washed manually:

Do not use detergent that includes suspended solid matter.

Do not use metal tools such as razor blades.

Ideally, use ammonia-based or diluted alcohol-based cleaning products for glass.

After washing, self-adhesive foam cork pads<sup>3</sup> must be used between the sheets of glass.

### Quality control

Coated glass must be inspected after washing. Halogen lamps should be installed above the glass so the operator can see the lights reflected in the coating when the glass leaves the washer.

## 4. Silkscreen printing and enamelling

### 4.1 General

The following limits apply to silkscreen printing and enamelling:

	Enamel on the glass side	Enamel on the coated side
Planibel Easy Clear	OK	OK*
Planibel Easy Blue	OK	OK*

\*When enamel is applied to the coating: see the next section.

#### ***4.2 Precautions that must be taken when enamelling the coated side***

Planibel Easy Clear and Easy Blue can generally be enamelled/silkscreen printed on the coating as long as the instructions below are followed.

If the silkscreen printing extends to the edge of the glass, compatibility between the enamel and the sealing and structural compound must be checked.

Any impurities on the upper surface (coated side) can be removed using a compressed dry-air jet.

In any case, the final result will depend on the type of furnace used, its settings, the colour and type of enamel used and the desired pattern. The manufacturer will have to carry out preliminary tests on a case-by-case basis in order to validate the visual result and the physical and chemical properties of the enamelled glass. We advise you to produce a prototype for approval of the final appearance.

The enamelled surface will lose its self-cleaning property.

#### ***4.3 Precautions that must be taken when enamelling the glass side***

Planibel Easy Clear and Easy Blue can generally be enamelled/silkscreen printed on the glass side as on normal float glass.

The presence of the coating on the underside will not affect the behaviour of the glass in the furnace.

When they are used, the upper and lower convection pressure profiles must be correctly set in order to keep the glass flat in the tempering furnace throughout the entire heating process. This also applies to the heating process even when convection is not used.

The furnace rollers must be kept as clean as possible.

#### ***4.4 Quality control***

The coated glass must be checked after enamelling or silkscreen printing. To do this, halogen lamps should be installed above the glass so the operator can see the reflection of the lights after silkscreen printing.

#### ***4.5 Performance of enamelled/silkscreen printed glass***

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

## **5. Thermal toughening/Heat-strengthening**

### ***5.1 Introduction***

Planibel Easy Clear and Easy Blue have the same normal emissivity as float glass (0.89). All tempering furnaces available on the market can be used for thermal toughening/heat-strengthening of these products.



## 5.2 Recommendations

Personnel responsible for handling the glass must wear clean safety gloves<sup>1</sup>.

The following options are possible for the position of the coating, as well as convection in the furnace.

	Position of the coating in the furnace		Type of convection	
	Face-up	Face-down*	Upper convection**	Lower convection**
Planibel Easy Clear	OK	OK	Authorised	Authorised
Planibel Easy Blue	OK	OK	Authorised	Authorised
* The furnace rollers and the quench conveyor lines must be clean. ** When they are used, the upper and lower convection pressure profiles must be correctly set in order to keep the glass flat in the tempering furnace throughout the entire heating process. This also applies to the heating process even when convection is not used.				

Tempering marks (stamps) can be applied prior to heat-strengthening on the upper face of the glass.

## 5.3 Settings

Planibel Easy Clear and Easy Blue must be thermally toughened using the same settings as those pertaining to equivalent uncoated glass, i.e. Planibel Clearlite and Planibel Dark Blue respectively.

Generally speaking, the furnace temperature must be 680 °C (upper) and 690 °C (lower). The heating time must be adjusted in order to optimise roller-wave and deformation.

## 5.4 Unloading

- If the glass is unloaded manually, personnel must wear clean safety gloves<sup>1</sup>.
- The largest and heaviest sheets should be handled with a suction-pad lifting beam.
- Given that toughened glass sheets are never perfectly flat, self-adhesive foam cork pads<sup>3</sup> should be placed around the edge of each sheet of glass to prevent contact between the glass and the coatings. For larger sheets, paper can be placed in the centre to prevent any contact between glass and coating during handling and transport.

## 5.5 Heat soak test

For thermally toughened glass, the risk of spontaneous breakage due to nickel-sulphide inclusions is inherent to tempered glass. The presence of such inclusions can in no way be considered a fault in the glass. In order to eliminate the risk of spontaneous breakage, an additional heat soak test can be carried out in accordance with standard EN 14179-1 (or equivalent standards for countries outside the EU).

Interlayers should be placed around the perimeter of the glass.

## 5.6 Quality control

The properties of Planibel Easy Clear and Easy Blue are not altered during heat treatment (tempering/heat-strengthening, bending and heat soak).

After the heat treatment, Planibel Easy Clear and Easy Blue must be checked as follows:

- The coating complies with standard EN 1096-1\*.
- Heat-strengthened glass must comply with standard EN 1863-1\*.
- Thermally toughened glass must comply with standard EN 12150-1\*.
- Any heat soak tests (HST) must be performed in accordance with standard EN 14179-1\*.

For enamelled glass, AGC recommends checking the appearance of the product by looking at the non-enamelled side.

**Note: For the European Union, Planibel Easy Clear and Easy Blue must be CE marked as per standards EN 1863-2, EN 12150-2 and EN 14179-2. The processor must comply with all requirements set out in these standards (ITT, FPC, etc.).**

\*Or equivalent local standards for countries outside the EU.

## 5.7 Packaging

If Planibel Easy Clear and Easy Blue must be delivered to another factory in cut sizes, the following recommendations for the packaging must be followed:

- A pH-neutral paper interlayer must be placed between each sheet.
- Care must be taken to ensure that the pack is properly attached to the rack to prevent the sheets from rubbing against each other.

## 6. Bending

Planibel Easy Clear and Easy Blue can be bent in heat-strengthened, tempered and annealed versions.

The heating and cooling settings will be identical to those used for Planibel Clearlite and Dark Blue respectively.

To reduce the risk of breakage in the furnace (bent and annealed version) or in the quench section (tempered/heat-strengthened bent version), AGC recommends smooth ground edges.

In all cases, the coating can be subject to compression or tensile stress. It is therefore possible to produce S-shaped bent glass.

## 7. Lamination

Planibel Easy Clear and Easy Blue can be laminated.

The coated side must always be placed in position 1. (building exterior)



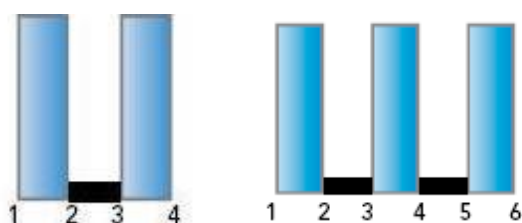
Note: For the European Union, laminated glass products, including Planibel Easy Clear and Easy Blue, must be CE marked as per standard EN 14449. The processor must comply with all requirements set out in these standards (ITT, FPC, etc.).

## 8. Use in single glazing

Planibel Easy Clear and Easy Blue can be used in facades as single glazing. The coating must always be in position 1 (building exterior).

## 9. Assembly in insulating glass units

Planibel Easy Clear and Easy Blue have been designed for assembly in double or triple glazing. The coating must always be in position 1 (building exterior).



### Quality control

It is essential to check whether the coating is in the right position prior to assembly. A mistake could lead to changes in performance or appearance.

Quality control for the final product (insulating glass) involves not only compliance with the instructions set out in this processing guide, but also meticulous checks at each stage in the manufacturing process.

Two or three halogen floodlights must be placed at the exit of each processing machine to light the glass correctly (vertically from top to bottom) to immediately detect any deviation from the regulatory parameters that could affect the appearance of the coating (e.g. scratches or other contamination).

If, during the insulating glazing process, the coating is found to be contaminated by the sealing compound, the compound must be cleaned before it dries using a soft cloth soaked in solvent recommended by the manufacturer of the glue. AGC recommends Silicone Remover made by Soudal. This product is available on our site: <https://www.agc-store.com/>  
If not available, a soft cloth soaked in methylated spirits or acetone should be used to remove the sealant while still wet (any health and safety requirements for using these chemicals should be followed). If sealant is allowed to dry the same method is recommended for its removal, but the task will be more difficult.

## 10. Storage of cut-sizes/IGUs

### 10.1 During processing in the same factory

After each processing step, when the glass is stored on racks, spacers are not needed if the original interlayer powder is still present. If for any reason whatsoever there is not enough interlayer powder left on the glass, especially after washing, we recommend that you place self-adhesive foam cork pads<sup>3</sup> between the sheets. The same recommendations apply to packs containing sheets of differing sizes.

Storage must comply with the recommendations set out in section I.2

### 10.2 Sending cut-sizes to another factory

If Planibel Easy Clear and Easy Blue must be delivered from the processing factor to another factory, the following recommendations for the packaging must be followed:

- A sheet of pH-neutral paper must be placed between each sheet.
- Care must be taken to ensure that the pack is properly attached to the rack to prevent the sheets from rubbing against each other.
- The pack of glass should be packaged in watertight plastic. Desiccant sachets should be placed inside the packaging.

### 10.3 On-site

When the glazing is delivered on-site for installation in the facade, 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.

For more information, please contact the Technical Advisory Service in Brussels ([tas@eu.agc.com](mailto:tas@eu.agc.com)).

## III. CONFORMITY and WARRANTY

### 1. Conformity

Planibel Easy Clear and Easy Blue comply with standard EN 1096-1, category A.

This standard also contains information about inspection conditions and quality criteria.

### 2. Warranty

The text of the warranty can be found at [www.agc-yourglass.com](http://www.agc-yourglass.com)

### 3. CE Marking

All information and statements related to the CE marking of Planibel Easy Clear and Easy Blue are available on [www.agc-yourglass.com/CE](http://www.agc-yourglass.com/CE)

When a customer transforms Planibel Easy Clear and Easy Blue (lamination, heat-strengthened, tempered, assembly in insulating glazing), it is responsible for the CE marking of the transformed products and associated requirements (Initial Type Test to be conducted, Glass Marking, Factory Production Control, etc.).

### 4. Disclaimer

The processor is responsible for inspecting the processed coated glass adequately before and after each stage in the manufacturing process and prior to installation. Failure to apply professional standards, customary instructions and processing instructions set out in this processing guide and related links will automatically void any warranty pertaining to AGC coated glass. We advise the processor to conduct preliminary trials with the typical glass compositions for the project prior to any further commitment to its customer. The processor is solely responsible for the quality of the final product.

## IV. GLAZING INSTRUCTIONS

AGC's glazing instructions are available at [www.agc-yourglass.com](http://www.agc-yourglass.com).

## V. CLEANING THE FACADE

Instructions for cleaning glass installed in facades are available at [www.agc-yourglass.com](http://www.agc-yourglass.com).

## VI. 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 Supplier: ROLAND Rue de la Petite Ile 4 B-Brussels -Belgium Tel.: +32 2 5250618 Fax: +32 2 5200856

### **<sup>3</sup> Recommended spacers for storing glass:**

Product description: self-adhesive foam cork 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