



AGC

ANTI-FOG*

PROCESSING GUIDE

VERSION 2.0 – NOVEMBER 2018

*ipius AF-1.1, Energy N-AF, ipasol neutral 70/37-AF, Stopray Vision-72-AF

Your Dreams, Our Challenge

This version of the guide replaces and cancels all previous versions.
Please regularly check www.agc-yourglass.com for any updates.

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1. PRODUCTS

This Processing Guide concerns the following products:

- iplus 1.1-AF, Energy N-AF, Stopray Vision-72-AF and ipasol neutral 70/37-AF
This glass is coated on both surfaces : Anti-fog on face 1 and iplus 1.1, Energy N, ipasol neutral 70/37 or Stopray Vision-72 on face 2.

Coating on face 1 is a pyrolytic coating (EN 1096 class A).

Coating on face 2 is an off-line coating (EN 1096 class C).

Both types of glass will be delivered with the anti-condensation coating facing outside the stillage.
The first glass of the stack, facing the stillage, is a cover sheet (Planibel Clearlite 4 mm).

If the customer wants the other way around, he will have to order it so.

2. RECEPTION AND STORAGE

2.1. 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.

2.2. Storage of 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.

Stock sheets (PLF)

For the following markets: Austria, Benelux, Switzerland, Germany, Denmark, Spain, Finland, France, United-Kingdom, Ireland, Italy, Lichtenstein, Norway, Sweden, San Marino, Estonia, Latvia, Lithuania, Poland, Czech Republic, Slovakia, Hungary, Bulgaria, Romania, Bosnia-Herzegovina, Macedonia, Serbia, Montenegro, Kosovo, Croatia and Slovenia: there is no special protection.

Shelf live: The glass has to be consumed within 3 months from the delivery in the processor's facility.

For all the other markets, there is a special protection on the packs:

Desiccant bags are fit on the upper side and on the lateral sides of the stack (two thirds of the height, from the upper corners). A protection tape is glued on the four sides.

Shelf live : 3 months maximum, after that the glass is delivered in the processor's facility, provided that the tape is still in place and damage free.

Once the pack is opened, the glass has to be consumed within one week.

Upon receipt, we advise you to check if the packaging has been damaged during transport/handling. If the weather-proof packaging has been damaged, condensation marks may appear on the glass. In this case, you should open the packaging to take out a dessicant package and weigh it. Contact AGC immediately.

Stock sheets (DLF)

For the following markets: Austria, Benelux, Switzerland, Germany, Denmark, Spain, Finland, France, United-Kingdom, Ireland, Italy, Lichtenstein, Norway, Sweden, San Marino, Estonia, Latvia, Lithuania, Poland, Czech Republic, Slovakia, Hungary, Bulgaria, Romania, Bosnia-Herzegovina, Macedonia, Serbia, Montenegro, Kosovo, Croatia and Slovenia:

For "loose" deliveries : no protection.

Shelf live : The glass has to be consumed within 3 months, from the delivery in the processor's facility.

For "endcaps" deliveries : Dessicant bags are fit on the upper side and on the lateral sides of the stack. A protection tape is glued on the four sides of the stack.

Shelf live : 3 months maximum, after that the glass is delivered in the processor's facility, provided that the tape is still in place and damage free. Once the pack is opened, the glass has to be consumed within one week.

For all other markets (endcaps):

A protection tape is glued on the four sides of the stack.

Then a protective plastic film is wrapped around the pack, with some dessicant bags placed between the glass pack and the plastic film.

Shelf live : 3 months maximum, after that the glass is delivered in the processor's facility, provided that the tape and the plastic film are still in place and damage free. Once the pack is opened, the glass has to be consumed within one week.

3. PROCESSING

3.1. Safety

At each stage of the processing procedure, the personnel responsible for handling the glass must have the adequate equipment: safety shoes, safety gloves², safety glasses, ...

3.2. Cutting

The Before cutting (for PLF/DLF), the anti-condensation coating can be found by looking to the scored edge of the glass.

The following specific precautions must be taken when cutting:

- When cutting, the anti-condensation coating must be facing downwards. By doing so, the cutting tool will be on the off-line coating. This one has to be edge-deleted, while the cutting operation or before the DGU assembly (see following §).
- The cutting oil used should be compatible with the coating, sufficiently volatile and water soluble³.
- The table and any breaking equipment liable to come into contact with the off-line coating on the glass must be pre-validated.
- The cutting table shall be free of abrasive materials like glass dust or chips...
- Cutting personnel must wear clean gloves to avoid leaving finger marks on the off-line.
- If the glass is to be cut using a template, the template must be positioned very carefully and care must be taken not to scratch it over the coating. We recommend that you place a protective sheet between the template and the glass.
- The cut sheets of glass must be stored on racks. Care must be taken when handling them to ensure that the off-line coating on the first sheet does not rest against the back of the rack. All subsequent sheets should be turned the other way.
- 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 sheets⁴.

3.3. Edge-deletion

The off-line coating of the iplus 1.1-AF, Energy N-AF, Stopray Vision-72-AF or ipasol neutral 70/37-AF has to be edge-deleted all around the edge of the glass so that the sealing compound makes contact with the glass and not the coating.

When being assembled in double glazing, the edges must be stripped to the same depth as the sealing compound. The edge of the stripped zone must meet the butyl line. Edge-stripping may be carried out either during the double glazing assembly process or whilst being cut. In both cases, care must be taken to ensure that dust from grinding is completely removed. The quality of the edge-stripping process can be inspected in one of two ways:

- using an ohmmeter (if the ohmmeter does not react, the coating has been correctly removed).
- visual inspection of reflection.

3.4. Edge processing

The iplus 1.1-AF, Energy N-AF, Stopray Vision-72-AF and ipasol neutral 70/37-AF can be edge-processed.

Looking to the cut-sizes coming from the cutting line, the position of the pyrolytic coating can be found by looking to the scored edge of the glass.

a) Handling the glass

The personnel responsible for handling and shaping the edges of the glass must wear safety gloves².

b) Shaping the edges

Several types of edging machine are available on the market:

Crossed belt system

We recommend for personnel to work with diamond belts and adhere strictly to the supplier's instructions, specifically in terms of speed and cooling.

The off-line coating will be facing upwards for horizontal machine, or facing the operator for vertical ones.

Vertical single edging system

Since the glass is held with chain tracks, there is a risk of scratching the coating. The off-line coating shall be facing the operator.

Horizontal double edging system

The off-line coating will face upwards. It is possible to use this type of machine provided that the glass is held by smooth, non textured belts. The speeds of the various belts must be synchronized. Mains water jets are placed in such a way that the coating is soaked and cleared of various impurities (e.g. Lucite or glass dust) just before they come into contact with the upper roller belts.

Numerical Control Systems (CNC)

The off-line coating will face upwards.

The glass shall be rinsed completely before to wash it. The washing shall be done immediately after the edge-processing.

General recommendations for edge-processing:

- The glass must remain moist throughout the shaping process in order to prevent 'natural drying'.
- The glass must be washed as soon as it has been shaped.
- The glass may be processed using dry crossed belts provided that the extraction system is sufficiently effective to remove the dust resulting from grinding.

3.5. Washing

This stage involves washing, rinsing and drying the glass.

The off-line coating shall face upwards

A mains-water spray station should be installed just before the point where the glass enters the washer. This will remove any abrasive elements on the coating (treatment residues) that could cause scratches when the brushes make contact with the coating.

The glass must be washed in clean, deionized water with a pH of 7 (± 1) and a conductivity of $<30 \mu\text{S/cm}$. No hard particles (such as calcium) or acidic/detergent agents should be present in the water used for washing and rinsing as these may damage the coating.

We recommend the use of 'soft' brushes (diameter of the bristles $<0,15 \text{ mm}$), 1-2 mm of which come into contact with the glass. There must be enough water to guarantee that the water is distributed evenly and efficiently across the coating before it comes into contact with the brushes.

It is also important not to stop the cycle whilst the glass is in the washing machine.

After washing, micro-suction pads⁴ should be used on the perimeter of the glass in the area that is going to be edge-stripped in order to avoid any contact between glass and coating. For large sheets of glass, a sheet of paper should be placed on the centre of the glass.

The glass must be completely dry. We recommend checking whether the air filters of the ventilation units are clean.

Two or three halogen projectors will be available at the exit of the washer to light the glass correctly (vertically from top to bottom) and even detect and quickly correct any deviations from the requirements listed above.

Summary of the quality of water used for shaping and washing the glass:

AGC don't recommend to use coolant in the water, during the edge-processing.

Regarding the washing process :

- No detergent shall be used
- Water Temperature < 40°C
- pH 7 ± 1
- Conductivity < 30 µS/cm

Precautions:

- If the glass is unloaded manually, the personnel must wear clean gloves².
- Larger and heavier sheets should be handled with a suction-pad lifting beam. The suction pads must be covered with a protective material¹.
- Care must be taken when handling them to ensure that the off-line coating on the first sheet does not rest against the back of the rack. All subsequent sheets should be turned the other way.

3.6. Packaging

If iplus 1.1-AF, Energy N-AF, Stopray Vision-72-AF or ipasol neutral 70/37-AF glazings are not assembled in insulating glass in the same factory, the following recommendations for packaging must be adhered to:

- A 1 mm-polyethylene foam spacer⁵ should be placed between each sheet.
- The pack of glass should be packaged in watertight plastic. Sachets filled with desiccating agents should be placed inside the packaging⁶.
- Care must be taken to ensure that the pack is properly attached to the rack so that the sheets do not rub together.
- The glass will be assembled into insulating glass within one week after it has been washed.

3.7. Use in single glazing

iplus 1.1-AF, Energy N-AF, Stopray Vision-72-AF and ipasol neutral 70/37-AF are on one side class C coatings and cannot be used as single glazing.

3.8. Assembly in Insulating Glazing Unit

iplus 1.1-AF, Energy N-AF, Stopray Vision-72-AF and ipasol neutral 70/37-AF must be assembled in DGU. The Anti-Fog coating must be assembled in position 1.

The glass should be assembled in insulating glazing within one week after being cut.

The processor must check that the coating is compatible with the sealing products.

3.9. Identification of the coatings for the cut sizes Edge

If the glass is not edge-processed, it is very easy to find the position of the off-line coating, just by looking on the scored edge of the glass. Since the glass has been cut on the off-line coated side, the scored edge will indicate his position.

If the glass has been edge-processed, the scored edge is not visible anymore.

There are two ways to identify the coatings :

- By using a coatmeter (four points probe) : the anti-condensation coating will show a resistance > 8 Ohm. The off-line coating will show 2 to 3 Ohm.
- By touching both coatings with your gloves, the anti-condensation coating will be felt much smoother than the other one.

The Anti-Fog coating of the iplus 1.1-AF, Energy N-AF, Stopray Vision-72-AF and ipasol neutral 70/37-AF will always be in position 1.

3.10. Storage of cut sizes/IGU

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 sheets³. The same recommendations apply for packs with several glass dimensions.

The storage must be conform to the recommendations of § 1.2

b) To send cut size to another factory

If iplus 1.1-AF, Energy N-AF, Stopray Vision-72-AF and ipasol neutral 70/37-AF has to be delivered from the processing factory to another factory, the following recommendations for packaging must be adhered to:

- A 1 mm-polyethylene foam spacer should be placed between each sheet.
- 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) On site

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

4. WARRANTY AND CE MARKING

4.1. Conformity

The iplus 1.1-AF, Energy N-AF, Stopray Vision-72-AF and ipasol neutral 70/37-AF comply with the standard EN 1096-1.

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

4.2. Warranty

The warranty is available on www.agc-yourglass.com

4.3. CE Marking

All information and declarations related to the iplus 1.1-AF, Energy N-AF, Stopray Vision-72-AF and ipasol neutral 70/37-AF are available on www.agc-yourglass.com/CE.

Where customers process IGU with these coatings, they are responsible for CE marking processed products and fulfilling the associated requirements (performing initial type tests (ITTs), marking the glass, factory production control, etc.).

4.4. 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.

The processor is solely responsible for the quality of the final product.

5. GLAZING INSTRUCTIONS

The AGC glazing instructions are available at www.agc-yourglass.com.

The anti-condensation coating has to be facing outside (pos.1).

It is easy to detect the anti-condensation coating by using a coating detector. Indeed, the anti-condensation coating is electrically conductive.

6. CLEANING ON FACADE

The cleaning instructions for glazing installed on façades are available at www.agc-yourglass.com.

7. NOTES

1 Recommended protective material for suction pads:

Product description: suction cup housing

NB: max. diameter: 300 mm.

Supplier: IMPEXACOM

Rue des tourterelles 14-16

B -5651 Thy le Château - Belgium

Tel.: + 32 71 612145

Fax: + 32 71 612164

2 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

3 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

4 Recommended spacer for edge-processed iplus 1.1-AF, Energy N-AF, Stopray Vision-72-AF and ipasol neutral 70/37-AF:

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

5 Recommended packing foam:

Product description: 1 mm packing foam

Supplier: SCRIPHORIA

Wellen - Belgium

Tel.: + 32 11 370 111

6 Recommended sachets of desiccating agents:

Product description: desiccating agent in sachets of 125 g

Supplier: STOKVIS

Vilvoorde - Belgium

Tel.:+ 32 2 255 06 11