Sunlux

Sunlux Orion
Sunlux Chroma
Sunlux Dark Chroma

PROCESSING GUIDE

VERSION 2.0 – April 2018

AGC Obeikan

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

CONTENTS

I. RECEPTION AND STORAGE

1. Unloading

The packs of glass must be inspected on arrival. AGC Obeikan shall accept no liability for coating defects 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. 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.

In these conditions, the shelf-life of the Sunlux Orion, Sunlux Chroma and Sunlux Dark Chroma is 12 months in the customer facility.

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.

II. PROCESSING

0. Safety

At each stage of the processing procedure, the personnel responsible for handling the glass must have the adequate equipment: safety shoes, safety gloves[1], safety glasses, helmets…

1. Cutting

The following specific precautions must be taken when cutting:

- The coated side must be facing upwards to avoid any contact between the coated side and the surface of the table.
- The cutting oil used should be compatible with the coating, sufficiently volatile and water soluble[2].
- The table and any breaking equipment liable to come into contact with the coating on the glass must be pre-validated.

  Larger and heavier sheets can be handled with a suction-pad lifting beam. The pads shall be kept clean. The same remark applies of course for the stock-sheet loading, if handled on the coated side.

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[3]. The same recommendations apply for packs with several glass dimensions.

The Sunlux Orion, Sunlux Chroma and Sunlux Dark Chroma do not have to be edge-deleted.
They belong to the **Class-B** coating classification, according to the EN 1096

2. Edge processing

The Sunlux Orion, Sunlux Chroma and Sunlux Dark Chroma are designed to undergo, if needed, thermal toughening or heat strengthening. Accordingly, the edges of the glass must be shaped.

2.1 Handling the glass

The personnel responsible for handling and shaping the edges of the glass must wear suitable gloves[1].
Larger and heavier sheets can be handled with a suction-pad lifting beam. The pads shall be kept clean.

2.2 Shaping the edges

All the edge-processing machines available on the market are in principle suitable for the Sunlux Orion, Sunlux Chroma and Sunlux Dark Chroma:

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

During the shaping, the coated side shall be facing upwards or facing the operator in case of vertical machines.

Remark: regarding vertical single edgers, with caterpillar pads pinching system, a special care shall be taken at the cleanliness of the pads. Indeed, an excessive accumulation of glass powder and chips could affect the cosmetic of the coating.

2.3 Unloading

Larger and heavier sheets can be handled with a suction-pad lifting beam. The pads shall be kept clean. Due to the fact that the interlayer powder is removed during the washing process, we recommend placing micro-suction pads[3] 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.

3. Washing

This stage involves washing, rinsing and drying the glass.

The diameter of the bristles brushes shall not exceed 150 µ.
It is important not to stop the cycle whilst the glass is in the washing machine.

The resistivity of the water shall be lower than 100µS.The PH 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[3] should be used between the glasses.
Larger and heavier sheets can be handled with a suction-pad lifting beam. The pads shall be kept clean.

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.

4. Silk screen printing and enameling

4.1 Generalities

Larger and heavier sheets can be handled with a suction-pad lifting beam. The pads shall be kept clean. The following limitations apply for the silk screen printing and the enameling.

	Enamel on glass side	Enamel on coated side
Sunlux Orion	NO	OK*
Sunlux Chroma	NO	OK*
Sunlux Dark Chroma	NO	OK*
* a validation of the appearance as indicated in §4.2 is strictly necessary		

4.2 Precautions for enamel on the coated side

The Sunlux Orion, Sunlux Chroma and Sunlux Dark Chroma can generally be used for silk screen printing on the coated side as long as the instructions given below are followed.

If the silk screen printing is to go as far as the edge of the glass, the compatibility between enamel and the IGU or structural sealing sealant should be checked.

Any impurities on the upper surface (coated side) 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 color 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 enameled glass. We recommend producing a mock-up for the final aesthetic approval.

4.3 Precautions for enamel on the coated side

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.

4.4 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 AGC Obeikan Glass sales team or IBP (International Buildings Projects) team at info@agc-obeikanglass.com.sa.

5. Thermal treatment.

5.1 Introduction

The Sunlux Orion, Sunlux Chroma and Sunlux Dark Chroma coatings have a normal emissivity close to 0.6. All the tempering furnaces available on the market can be thus used to temper / heat-strengthen these products.

5.2 Recommendations

The personnel handling the glass must wear safety gloves[1].
Larger and heavier sheets can be handled with a suction-pad lifting beam. The pads shall be kept clean.
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**
Sunlux Orion	OK	NO	Allowed	Allowed
Sunlux Chroma	OK	NO	Allowed	Allowed
Sunlux Dark Chroma	OK	NO	Allowed	Allowed
** 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 heating process. The same approach for the heating profile, when no convection in used.				

Tempering kite markings may be made before toughening on the coated side of the glass.

5.3 Settings

The Sunlux Orion, Sunlux Chroma and Sunlux Dark Chroma can be heat tempered / heat-strengthened with the same settings as for the clear float,same thickness.

AGC recommends to keep the furnace temperature below 680 °C.
The heating time shall be very close as for clear float,same thickness.

Too high oven temperatures/heating time settings could lead to a coating degradation along the edges. The coated glass must be inspected after the quench section. 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 quench section.

For further information's, please contact AGC Obeikan's sales team or IBP (International Buildings Projects) team at info@agc-obeikanglass.com.sa.

5.4 Unloading

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

5.5 Heat Soak test

For thermally toughened glass, the risk of spontaneous breakage due to Nickel-Sulfide is not covered by AGC Flat 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.

5.6 Quality Control

For further information, please contact the Technical Advisory Service in Brussels AGC Obeikan's sales team or IBP (International Buildings Projects) team at info@agc-obeikanglass.com.sa.

After the toughening process, the Sunlux Orion, Sunlux Chroma and Sunlux Dark Chroma, should be inspected as follows:

- The coating is inspected in accordance with EN 1096-1*
- Toughened glass must comply with EN 12150-1*
- Heat-strengthened glass must comply with EN 1863-1*.
- 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

6. Bending

The Sunlux Orion, Chroma and Dark Chroma can be curved, curved tempered or curved heat-strengthened with the same furnace settings as for the glass substrate.

For further information, please contact AGC Obeikan's sales team or IBP (International Buildings Projects) team at info@agc-obeikanglass.com.sa.

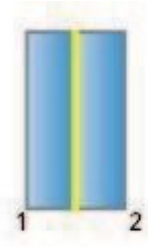
In order to limit the risk of breakage in the oven (annealed curved version) or in the quench section (tempered/heat-strengthened curved version), AGC recommends making a smooth-edge processing of the glass.

The coating can be in compression or tension, for curved annealed.. It is thus allowed to produce "S – shaped" curved glass.

For curved tempered, as the coating cannot be face downwards in the oven, it will be in compression

7. Laminating

The Sunlux Orion, Sunlux Chroma and Sunlux Dark Chroma can be laminated,in annealed,tempered or heat-strenghened version.



The following positions are possible for the coating.

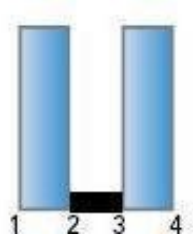
	Coating position in the laminated glass		
	1	against PVB	2
Sunlux Orion	NO	Tests ongoing	OK
Sunlux Chroma	NO	Tests ongoing	OK
Sunlux Dark Chroma	NO	Tests ongoing	OK
Notes: pos.1 means outside the building; pos.2 means inside the building			

8. Use in single glazing

So far, the Sunlux Orion, Sunlux Chroma and Sunlux Dark Chroma cannot be used in façades in single glazing.

9. Assembly in Insulating Glass Unit

The Sunlux Orion, Sunlux Chroma and Sunlux Dark Chroma are designed to be assembled in double glazing with the following restrictions for the coating position.



	Coating position in the laminated glass			
	1	2	3	4
Sunlux Orion	NO	OK	NA	NA
Sunlux Chroma	NO	OK	NA	NA
Sunlux Dark Chroma	NO	OK	NA	NA
NA: no technical reason to put the coating in this position				

When the coating is in contact with the IGU sealant, the compatibility of the primary and secondary sealants of the DGU with the coating(s) will be validated on a case to case basis. The same validation will be necessary for the structural bonding.

Quality control
It is essential to check that the coating is in the correct position before assembly. Any mistake could lead to changes in performance, durability and/or aesthetics.

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

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

10. Use in structural glazing

When installation or assembling is by mechanical methods, structural glazing or other techniques, tests for compatibility and adherence of the coating or the glue must be made in each case with the manufacturer of the glue.

11. Storage of cut sizes / insulated glazing

11.1 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[3]. The same recommendations apply for packs with several glass dimensions.

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

11.2 Sending cut sizes to another factory

If the Sunlux Orion, Sunlux Chroma are to be delivered to another factory in heat-treated cut- sizes, the following recommendations for packaging must be adhered to:

- The coating is inspected in accordance with EN 1096-1*
- The glass block shall be packed in a water and sand-tight envelope. Dessicant bags will be placed inside.
- Care must be taken to ensure that the pack is properly attached to the rack so that the sheets do not rub together.

11.3 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.

III. CONFORMITY

1. Conformity

The Sunlux Orion, Sunlux Chroma and Sunlux Dark Chroma comply with the standard EN 1096-1, category B.

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

2. Guarantee

AGC guarantees that, for a period of 10 years from the date of shipment of the glass to AGC, the Sunlux Orion, Sunlux Chroma and Sunlux Dark Chroma supplied in IGU will not significantly suffer any of the following changes – affecting the functionality of the glass – of the coating:

- Peeling, cracking
- Changes of appearance as regard the colour under normal conditions of use as detailed in AGC's brochure.

This guarantee is valid provided that:

- the glass has been specified (e.g. the glass thickness),processed, stored, handled and installed in accordance with the standards or code of good practice in force in each local market (national regulation), as well as with the instructions given in our documentation
- during transport, storage, handling, installation or afterwards, the coating has not been damaged, whether intentionally or accidentally
- the coating has not come into contact with abrasive agents or corrosive chemicals (acid/basic etc)
- AGC's maintenance and cleaning instructions have been complied with

Should the coated glass have been incorporated in any other composite product (insulating glazing, laminated, etc.) by a third party, the said third party is responsible for verifying the compatibility of the other materials (sealing glue, etc.) with the coating.

This guarantee implies and is limited to the commitment by AGC to replace free of charge the defective glazing (when it is proved to be defective according to the criteria outlined above) at the place of initial supply. It excludes any glazing or deglazing (direct or indirect) costs as well as damage caused by the replacement, deglazing or glazing, including accidental handling.

This guarantee does not cover glass breakage.

Replacement glazing becoming defective after expiration of the guarantee of the initial glazings, shall be excluded from the guarantee which shall not be extended beyond the period of guarantee of the initial glazing.

Any wider guarantee given by a third party (expressed or implied) to a customer of AGC shall not be considered to an extension of the guarantee from AGC.

3. 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.

IV. GLAZING INSTRUCTIONS

The AGC Obeikan glazing instructions are available on request from your local AGC Obeikan' s sales representative.

V. CLEANING ON FACADE

The cleaning instructions for glazing installed on facades are available on request from your local AGC Obeikan' s sales representative.

VI. NOTES

[1] 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

[2] 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

[3] Recommended spacer for toughened/heat-strengthened:
Product description: Cork disks with micro suction pads (3 × 20 × 20 mm)
Supplier: VITO IRMEN
Mittelstrasse 74-80
D - 53407 Remagen -Germany
Tel.:+ 49 26 42 40 07 10
Fax:+ 49 26 42 42 913

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

Sunlux Chroma, Sunlux DarkChroma
1. Sealants compatible for DGU

Sealant ID	Type	Application	Sunlux Chroma Sunlux DarkChroma
DC993	Silicone	Structural glazing	-
DC895	Silicone	Structural glazing	-
DC3362	Silicone	Insulated glass	✓
DC3362 HD	Silicone	Insulated Glass	✓
DC3363	Silicone	Insulated Glass	✓
DC756	Silicone	Weather sealant	-
DC768	Silicone	Weather sealant	-
DC791	Silicone	Weather sealant	-
DC791T (with primer)	Silicone	Weather sealant	-
Thiover	Polysulphide	Insulated glass	-
Thiover F1	Polysulphide	Insulated glass	-
GD 677	Polysulphide	Insulated glass	-
GD 116	Polysulphide	Insulated glass	-
PS 200	Polysulphide	Insulated glass	-
SG500	Silicone	Structural Glazing	-
IG25	Silicone	Insulated glass	-
IG25HM+	Silicone	Insulated glass	-
JS 442	Polyurethane	Insulated glass	✓
Proglaze II	Silicone	Structural Glazing	-
JS562	Silicone	Structural Glazing	-

Sunlux Chroma, Sunlux DarkChroma
2. Sealants compatible for Structural glazing according ETAG 002

Sealant ID	Type	Application	Sunlux Chroma Sunlux DarkChroma
DC993	Silicone	Structural glazing	-
DC895	Silicone	Structural glazing	-
DC3362	Silicone	Insulated glass	✓
DC3362 HD	Silicone	Insulated Glass	✓
DC3363	Silicone	Insulated Glass -	✓
DC756	Silicone	Weather sealant	-
DC768	Silicone	Weather sealant	-
DC993	Silicone	Weather sealant -	✓
DC791T (with primer)	Silicone	Weather sealant	-
Thiover	Polysulphide	Insulated glass	-
Thiover F1	Polysulphide	Insulated glass	-
GD 677	Polysulphide	Insulated glass	-
GD 116	Polysulphide	Insulated glass	-
PS 200	Polysulphide	Insulated glass	-
SSG4400	Silicone	Structural Glazing	✓
IG25	Silicone	Insulated glass	-
IGS3723	Silicone	Insulated glass	✓
JS 442	Polyurethane	Insulated glass	-
Proglaze II	Silicone	Structural Glazing	-
JS562	Silicone	Structural Glazing	-