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Appendix: Recommended material
1. GENERAL

1.1. Product description, aspect

High performance glazings with enhanced thermal insulation are often subject to outdoor condensation due to the low temperature of the external glass. SGG VIEWCLEAR® II is a coating for side1 application that prevents external condensation on highly insulated double and triple glazings. It is a highly durable coating deposited by magnetron with high transparency and neutral color, specially designed for double or triple glazings in combination with Planitherm products.

SGG VIEWCLEAR® II must be tempered to reach its performances. Emissivity, transparency and color are significantly changed during tempering process.
- SGG VIEWCLEAR® II coating before tempering looks yellow in transmission and absorbent
- SGG VIEWCLEAR® II coating after tempering looks clear with a green-blue color in reflection and neutral color in transmission.

1.2. Thickness and dimensions

SGG VIEWCLEAR® II is available in standard thicknesses and sizes. For further details, refer to the relevant commercial documentation or contact the sales department.

1.3. Quality Criteria for the coatings

1.3.1. Definition of appearance defects

The following definitions are given by the standard EN1096-1:
- Uniformity defect: slight visible variation in colour, in reflection or intransmission, within a coated glass pane or from pane to pane.
- Stain: defect in the coating larger than punctual defect, often irregularly-shaped, partially of mottled structure.
- Punctual defect: punctual disturbance of the visual transparency looking through the glass and of the visual reflectance looking at the glass. Spots, pinholes and scratches are types of punctual defects.
- Spot: defect that commonly looks dark against the surrounding coating, when viewed in transmission.
- Pinhole: punctual void in the coating with partial or total absence of coating and it normally contrasts clear relative to the coating, when viewed intransmission.
- Scratches: variety of linear score marks, whose visibility depends on their length, depth, width, position and arrangements.
- Cluster: accumulation of very small defects giving the impression of a stain.

1.3.2. Conditions of observation

The conditions of observation are given in the standard EN1096-1. Please refer to it for details.

1.3.3. Acceptance criteria of coated glass defects

Without prior agreement between both parties, the standard EN 1096-1 will apply.
1.4. Durability

The SGG VIEWCLEAR® II coating meets the class A durability criteria of European standard EN1096-2.

1.5. Position of the coating and identification of the coated side

1.5.1. Position of the coating

The SGG VIEWCLEAR® II coating must always be positioned on side 1, even when it is combined with other coatings.

See the following scheme:

![Position of the coating in DGU](image)

1.5.2. Identification of the coated side

As the coating is electrically conductive, the coated side can be identified with anohmic detector (SGG multicoating detector, DIG, TCC, fuse tester). To avoid any mistake, a pre-testing on a well identified sample must be performed with each type of detector to check the compatibility with SGG VIEWCLEAR® II coating. The green / blue color of the coating can also be used to identify optically the position of the coating.
1.5.3. Marking the coated face

During the processing stage, it is possible to mark the product on the coated side or glass side:

- **For toughening and laminated assembly**: use a Pentel felt tip or Edding type paint pen.
- **For insulating glazing**: use lithographic chalk or Chinagraph wax type pencil.

1.5.4. Identification of the finished product

To identify the **sgs VIEWCLEAR® II** product, it is compulsory to use labels which do not leave any adhesive marks.
2. TRANSPORT, RECEPTION, STORAGE AND HANDLING

2.1. Transport

The sheets of **SGG VIEWCLEAR® II** are usually currently transported in 2.5 tons stacks, with dimensions of 6,000 mm x 3,210 mm (jumbo size sheets). Other dimensions and pack weights are possible on request.

- The sheets of glass are stacked with the coating towards the interior of the pack, unless specifically requested otherwise by the customer.
- The sheets of glass are always separated by neutral polymer interleavant powder.

2.2. Reception of the delivery

Check that the position of the coating corresponds to what has been ordered – it can be on the outer face or on the inner face if this has been ordered.

Each delivery is identified using an identification label which includes the following information:

- Product name,
- Size and thickness,
- Number of sheets,
- Net weight,
- Production date of the coating,
- Barcode and batch number.

The glass must be checked before processing. Any defect on the coating must be immediately communicated to the supplier and must be accompanied by all of the information that is on the identification label.

No complaint will be accepted for damages caused either during or after processing. Consequently, the manufacturer must make sure that his process is suitable for **SGG VIEWCLEAR® II** coated glass and that his quality control is suitable for detecting quality-related problems as early as possible (see § 1.3. "Quality Criteria for the coatings"). In the event of a complaint, samples will need to be provided.

2.3. Storage

**SGG VIEWCLEAR® II** must be stored vertically in a dry, well-ventilated location. It must be sure that water is prevented to fall on the stillage during storage. The coating is guaranteed up to 6 months after reception on the customer premises.

2.4. Handling

Finger marks and dirt on the **SGG VIEWCLEAR® II** coating, which would require additional cleaning procedures, must always be avoided. If a local cleaning is necessary, use a cloth moistened with ready-to-use glass cleaner, clean alcohol or isopropanol.

**SGG VIEWCLEAR® II** coated glass must be handled with clean dry gloves (type used for SGG PLANITHERM® coatings). It is recommended to avoid any contact with the main surface.

- For manual or automatic unstacking, the suction cups must be covered by protective sleeves or cleaned with alcohol if they come into contact with the coated face.
- Removal from the stack using tongs is also possible (make sure that the tongs or Nipper devices are clean).
- The coating must not come into contact with any rough objects.
3. PROCESSING OF SGG VIEWCLEAR® II

SGG VIEWCLEAR® II is a coating which is resistant to the external solicitations (mechanical and chemical) but some precautions must be taken during all processing work to avoid any deterioration of the product. Regular checks must be made to ensure that anything in contact with the coating is clean and free from particles of glass which could scratch and damage the coating.

It is preferable to process SGG VIEWCLEAR® II with the coating facing upwards. However, due to its good mechanical resistance, it is possible to process this coating face down, including in the tempering step. In case of processing coating face down is needed, prior examination and certification by a SGG Technical Support Manager is highly recommended. SGG will not consider potential claims arising from non-certified lines.

3.1. Handling on the production lines

All of the handling recommendations described in § 2.4. are valid.

- The lifting bars, tools and suction cups must be completely clean at all times. They must be cleaned (using alcohol) or protected by sleeves.
- Clean, dry gloves (type used for SGG PLANITHERM®) must be worn for manual handling of the glass.
- All equipment that is designed for coated glass such as SGG PLANITHERM®, can generally also be used for SGG VIEWCLEAR® II.

3.2. Glass cutting

SGG VIEWCLEAR® II glass is cut in the same way as ordinary float glass but, as a coated glass, it remains sensitive to the cutting process conditions. The following recommendations must therefore be observed to avoid any deterioration of the coating:

- Position the glass on the cutting table with the coating facing upwards to avoid damaging it through glass debris or dust on the cutting table.
- SGG VIEWCLEAR® II glass must be cut using vaporizing cutting oil (for example ACECUT 5250 or 5503).
- Avoid excess oil so that it does not extend to more than 1 cm from the edge.
- Fragments of glass on the surface must not be removed by hand, but should be blown with air.
- When the cut sheets are stacked before the next stage, separate the glass panels using:
  - Polymer interleavant powder;
  - Clean cardboard strips;
  - Flexible cork, transport pads or chlorine free paper with no adhesive.
- As it is a durable coating used for side 1 applications, SGG VIEWCLEAR ® II does not require any edge-deletion.
3.3. Edgeworking

The coating must be placed face upwards.

- The glass must be washed immediately after the edgework, in a special washing machine for coated glass. (see § 3.5. Washing)
- It is advisable to use clean water
- The Bilateral equipment or damp Crossed Strips that are designed for coated glass are compliant for the processing of SGG VIEWCLEAR® II.

All other equipment (rectilinear, dry arising, etc.) requires preliminary validation.

Manual edgeworking:
- Handle with gloves around the edges.
- Avoid any contact with the main surface.

Automatic edgeworking:
- Check the cleanliness of the glass driving belts.
- Check that there are no runs of grease or oil.
- Check that the detectors (presence of glass) do not mark the coating

3.4. Drilling

SGG VIEWCLEAR® II glass can be drilled using drills as long as the handling instructions are followed (see § 2.4. and 3.1.) and as long as the technical adjustments are made.

- The glass must be washed immediately after drilling in a special washing machine for coated glass. (see § 3.5. Washing). Before being moved to the washing machine, the glass must be rinsed with plenty of water (ramp at the top of the washing machine). This prevents the water in the washing machine from becoming polluted by drilling residue (risk of scratches).

3.5. Washing

SGG VIEWCLEAR® II glass must be positioned with the coating facing upwards. Preferably use a special machine for coated glass (see specific specifications).

The glass must be washed no later than 4 days after having been cut. Saint-Gobain Glass recommends the following for a machine that is not specifically designed for coated glass: if the washing installation differs from the following description, run tests to check the washing quality and make sure that the machine does not damage the coating.

Additives:
- Do not use cerium oxide.
- Do not use additives in the water.

Pre-washing area:
- Pre-wash ramp followed by one pair of cylindrical brushes, tapwater between 30 and 40°C, preferably close to 40°C, without any detergent.
Washing area:
- At least 2 pairs of cylindrical brushes, demineralized water at room temperature, maximum chloride concentration 3mg/l, and pH value 6-8.

Brushes:
- Flexible (soft) clean polyamide bristles with a maximum diameter of 0.15 mm and 20-40 mm length should be used.
- Take care that all the brushes be perfectly clean and regularly washed and trimmed. Failing to do this may cause scratches.
- Brushes may be trimmed by washing un-arised glass panes. Any hard brush must be lifted.

Rinsing area:
- Use demineralized water with a maximum conductivity of 20μs/cm, and a pH value of between 6 and 8.

Drying:
- Use an air-blowing installation equipped with clean and regularly maintained filters.

Make sure that the glass does not stop in the washing machine. There must be no water or marks left on the coating after the drying operation. If necessary, clean locally without spreading it over the whole sheet, using a cloth moistened with ready-to-use glass cleaner, clean alcohol or isopropanol.

3.6. Tempering

SGG VIEWCLEAR® II is a coating with an emissivity value intermediate between float glass and classical Low-e coatings like SGG PLANITHERM®. Moreover, during the heating process, the emissivity of SGG VIEWCLEAR® II coated glass decreases.

It is then not possible to give any standard tempering program for all types of furnaces. Experience has shown that SGG VIEWCLEAR® II coated glass can be successfully tempered with furnace parameters close to clear float glass.

The general recommendations are the following:
- The tempering parameters (temperature, time, convection) must be adjusted to reach a good tempering quality (fragmentation) and a flat shape of the pane.
- Due to the low-emissivity of SGG VIEWCLEAR® II coating it can be necessary to adjust the convection pressure on coated side to reach a good flatness.
- The recommended start point for adjustment is a clear float glass program + 10% heating time.

After toughening, each sheet of glass must be separated using cork pads or any other suitable separation medium like the films recommended for SGG PLANITHERM® coatings.
3.7. Electric heat-soak testing
The electric heat-soak treatment of toughened glass can be performed as long as clean and dry spacers as for other Low-e coated products are used.

3.8. Assembly, handling and cutting of laminated glass

3.8.1. General

- Make sure that the coating is always on the outside of the laminated unit. Incorrect positioning (inside) would result in a loss of adhesion of the PVB and a loss of the “safety” function. Moreover, the anticondensation function would not been obtained.
- Avoid any contact of the PVB with SGG VIEWCLEAR® II coating.
- Place the coating facing upwards.

3.8.2. Assembly instructions

- To identify the coating side, refer to §1.5
- To wash the glass before assembly, use brushes which are designed for coated glass and rinse the glass with demineralized water < 5μs/cm at the nozzles.
- The roller conveyor and calendering systems on the production line must be regularly inspected: they must be kept clean, free from any particles of glass, and should rotate correctly so that the SGG VIEWCLEAR® II coating is not damaged.
- Clean off all deposits of PVB in contact with the coating before placing in the furnaces or autoclaves.
- Apply the standard autoclaving cycles. Use dry spacers or protected spacers. The autoclave must be cleaned regularly to prevent any contamination of the coating.

3.8.3. Cutting instructions

- To cut laminated glass, use the existing tables for laminated glass. For further details, refer to § 3.2.
- Where SGG VIEWCLEAR® II is associated with a coating on face 4 of the laminated unit, position the glass on the cutting table with the SGG VIEWCLEAR® II coating facing down onto the table, making sure that the cutting table has been cleaned beforehand and is free of glass debris or dust.
3.9. Manufacture of insulating glass units

To assemble sgg VIEWCLEAR® II in an insulated glass unit, follow the handling, cutting, edge-stripping and washing instructions that are given in the previous sections.

On the assembly line, the coating must always be facing the operator to avoid contact with the rollers, belts and guide rollers. Production labels should not be adhered to the coated face.

- sgg VIEWCLEAR® II does not require any edge-deletion.
- Polysulphide, polyurethane or silicone mastics can be used.
- Any traces of sealant remaining on the coating after application must be removed immediately before they harden. They can be cleaned off using a neutral product for windows and soft paper.
- sgg VIEWCLEAR® II coating is compatible with lead decorative devices (squares, diamonds).

After assembly, each sheet of glass must be separated using cork pads or any other suitable separation medium.
4. INSTALLATION OF DOUBLE-GLAZED UNITS ON SITE

4.1. General

The selection of a suitable and practicable glazing method depends on a variety of factors such as the size of the glass, the exposure and the type of framing material and system.

Glazing and fixing techniques must comply with the recommendations of the relevant national standards. The setting and location of the glass, the dimensions of channels and the permitted deflection for the frames of insulated glass units are not specific to SGG VIEWCLEAR® II products.

During transport, unloading, storage and glazing, all the recommendations for handling (see §2.4, §3.1) must be followed. Make sure that any coverings, interlayers, suction cups, tools, are clean and free of hard particles that could damage the coating.

Avoid attaching adhesive stickers to the coating as their removal may damage the coating.

4.2. Assembly in a frame

It is important to respect the following instructions for the installation of a glazing with SGG VIEWCLEAR® II coating:

- Always position the SGG VIEWCLEAR® II coating on the outside of the window.
- In order to avoid damaging the glass with aggressive contaminants from site-works (e.g. paint, plaster, mortar), it is recommended that the insulating glass units are installed after all other work on site has been completed.
- Avoid splashes of concrete, plaster, mortar residues as far as possible. To prevent a chemical attack of the coating, such substances must be removed from the glass immediately before drying or hardening with plenty of water.
- It is recommended that the glass is cleaned as soon as it is installed.
- If other works are being carried out close to the vicinity of the window installation, cover the glass with suitable protections to prevent staining (e.g. from paint, varnish, glue, sealant, cement, plaster, mortar, etc.) and splashes of abrasive or hot particles (grinding or welding sparks, etc.) on the glass.
5. CLEANING of a glazing with SGG VIEWCLEAR® II coating

All the cleaning equipment must be kept clean. This is to prevent any dirt or abrasive particles transferring from the equipment back onto the glass which may scratch or damage the coating.

**Recommended cleaning equipment:**
- A soft, clean lint-free cloth or chamois leather.
- A clean, soft non-abrasive sponge.
- A clean, non-metal window squeegee.

**Recommended cleaning products:**
- Clean water will normally suffice.
- Standard, mild glass-cleaning products can also be used.

**Important**
- Avoid contact with all sharp or abrasive objects including jewellery, buckles, tape measures, razor blades, Stanley knives, scouring pads, steel wool, sandpaper etc.
- Do not use any glass treatment products containing abrasive particles.
- Do not use any commercial cleaning products which are intended specifically for cleaning elements other than glass.
- Do not use aggressive, strongly acid or alkaline chemical products: soda, bleach, washing powder, white spirit etc.
- Never attempt to clean off a specific mark on the surface of SGG VIEWCLEAR® II without applying water first.
Recommended Material

The following equipment is only indicative. For more updated information please have a look to our web sites: www.saint-gobain-glass.com

Gloves:

- 100% Kevlar, does not leave any marks if grease is not applied. There is nevertheless the risk of slipping in your hand when handling large glass.

  Lebon protection
  reference HANDKEEPII
  ZI de Somain-Aniche
  59490 Somain, France
  Tel.: +33 (0)3 27 90 91 13

- 100% Kevlar with rubber edges. Leaves very small marks which can be easily removed. Provides a good compromise between grip and risk of pollution.

  ABRIUM
  (reference Perfect fit 2032085)
  5 rue Jerzy Popieluszko
  62302 LENS Cedex, France
  Tel.: +33 (0)3 21 28 22 24

Marker:

Type: PENTEL White
Item No.: 100W
Barcode: 3 474 370 111234

Description:
Multi-purpose, permanent white marker for use on non-absorbent materials such as metal, plastic, glass, etc.
Cork Block:

Reference:
- vitokork 2691818399
  (size: 18x18, thickness (2+3))
- vitokork 26802502403
  (size: 24x25, thickness (2+3))

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