This document contains essential instructions for the use of SGG COOL-LITE SKN glass sheets.

All documents previously published by SAINT-GOBAIN GLASS are replaced by the present document.

SAINT-GOBAIN GLASS has taken every reasonable measure to ensure that the information contained in the present leaflet was exact at the time of its publication.

However, SAINT-GOBAIN GLASS keeps the right to modify or add any information without previous notice.

SAINT-GOBAIN GLASS is not liable for the possible lack of information on SGG COOL-LITE products that would not be contained in the present document.

Distributor

Saint-Gobain Glass UK Ltd
Weeland Road, Eggborough
East Riding of Yorkshire
DN14 0FD
Tel: 01977 666100
Fax: 01977 666203

www.saint-gobain-glass.com

glassinfo.uk@saint-gobain-glass.com

SAINT-GOBAIN GLASS

SGG COOL-LITE SKN 174 II
SGG COOL-LITE SKN 165 II
SGG COOL-LITE SKN 154 II

Guidance for use

August 2009

SAINT-GOBAIN GLASS COMFORT

CONTENT

1- GENERAL

1.1. Product description

SGG COOL-LITE SKN II is a high performance solar control glass, manufactured by magnetically enhanced cathodic sputtering of several metallic coatings onto clear float glass in a vacuum. The metallic solar control coatings offer a high level of solar protection (low solar factor) and enhanced thermal insulation by reflecting long-wave infrared heat radiation back into the building, thereby greatly reducing heat loss. SGG COOL-LITE SKN II must always be assembled into an insulating glass unit, with the coating on face 2, facing the cavity.

SGG COOL-LITE SKN II is linked to SGG COOL-LITE SKN .

- SGG COOL-LITE SKN II is the “to be toughened” product: This special version of SGG COOL-LITE SKN II has been developed for use where SGG COOL-LITE SKN toughened safety glass (or heat-strengthened glass) is required. After toughening (or heat-strengthening), SGG COOL-LITE SKN II has the same optical appearance and spectrophotometric characteristics - within the tolerance limits - as the annealed product SGG COOL-LITE SKN. SGG COOL-LITE SKN II cannot be used in annealed form as it acquires its characteristics during the tempering process. It conforms to Class C as defined in the European standards EN 1096-1 and EN 1096-3. It must only be used in insulating glass units, with the coating on face 2. It cannot be used in single glazing or in opacified single glazing.
- SGG COOL-LITE SKN is the annealed product: This product conforms to Class C as defined in the European standards EN 1096-1 and EN 1096-3. It must only be used in the manufacture of insulating glass units, with the coating facing the cavity on face 2. It cannot be used in single glazing or in opacified single glazing.
- The annealed SGG COOL-LITE SKN and the toughened (or heat-strengthened) SGG COOL-LITE SKN II, can be mixed in the same façade of a building. Both products have been specially developed to achieve this “matching”.
- Both products will be CE Marked.
- This guideline only covers the “to be toughened” product SGG COOL-LITE SKN II. For all annealed SGG COOL-LITE SKN coatings please refer to the document “SGG COOL-LITE Classic, K and SK, ST temperable – Guidance for use – Solar control coated Glass”).

SGG COOL-LITE SKN II is the “to be toughened” product

SGG COOL-LITE SKN is the annealed product

1.2. Thickness and dimensions

1.2.1. Thickness and dimensions

SGG COOL-LITE SKN II is available in standard thicknesses 6 mm, 8 mm, 10 mm and jumbo sizes (3210 mm x 6000 mm). For any other thickness or dimension please contact us.

1.2.2. Glass thickness recommendations

- Calculations and recommendations are the same as those for conventional glass sheets (annealed, toughened, laminated...) assembled in insulating glazing.
- Relevant national and local regulations should be complied with.

1.3. CE Marking

SGG COOL-LITE SKN products comply with the harmonised European Norm EN 1096-4 for coated glass and are CE Marked. The “Characteristics, Performance Identification Paper” - CPIP document - for each CE Marked product is available at the following website address: www.saint-gobain-glass.com/ce.

1.4. Quality criteria for the coatings

1.4.1. Definitions of appearance defects

The following definitions are given by the standard EN1096-1:

- Uniformity defect: slight visible variation in colour, in reflection or in transmission, 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 in transmission.
- 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.

1.4.2 Conditions of observation

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

1.4.3 Acceptance criteria of coated glass defects

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

Remark:

Any coated glass, even the most neutral types like SGG COOL-LITE SKN II and SGG COOL-LITE SKN, may show slight variances in appearance when observed in reflection. This is an inherent feature of the products, and is affected by the distance, the angle of observation, the ratio between the interior and exterior lighting levels of the building, and the type of objects reflected in the façade.

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

1.5.1. Position of the coating

SGG COOL-LITE SKN II coated glass sheets must always be assembled into an insulating glass unit. The coating must be edge-deleted (see § 3.2.). The coating is always placed on face 2 of the insulating glass unit, never on face 1, 3 or 4.

The position of the coating can be verified using a coating detector available from SGGUK.

1.5.2. Laminated glass

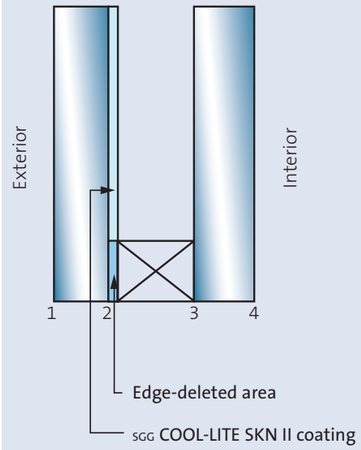
The coating must never be in contact with the PVB interlayer. The laminated glass must then be assembled into a insulating glass unit with the coating facing the cavity.

1.5.3. Identification of the coated face

The coated side of a SGG COOL-LITE SKN II glass sheet exhibits a slightly different appearance in reflection compared to ordinary clear float glass. It can be checked visually by reflecting a bright light source, such as a cigarette-lighter, or by using a coating detector (high ohmic electrical resistance tester). As the contact points of the coating detector can induce damage to the coating, the detector should be only used on the edges of the glass.

Coating detectors are available for single and double-glazing. Please contact Saint-Gobain Glass for ordering details.

Insulating glass unit
with SGG COOL-LITE SKN II
(coating on face 2)



1.6. Thermal stress

The spectrophotometric properties of the SGG COOL-LITE SKN coating (annealed version) show a certain degree of solar energy absorption, which may cause thermal stresses in the glass. Such stresses are often less than the critical level that may lead to thermal breakage of an annealed glass. Precautions should be taken when the glazing is likely to comprise areas of widely differing temperatures; for example, if the glass edges are encased within the rebate of the frame, shaded areas, the presence of blinds or curtains and when used in sliding windows. In each case, the possibility of thermal stress will have to be taken into account.

- Every possible care should be taken during handling, transport and installation of the glass sheets to avoid damage to the edges of the sheet as this may considerably reduce glass resistance.
- SGG COOL-LITE SKN thermal breakage can be prevented by using the toughened SGG COOL-LITE SKN II version. For further advice concerning toughening of the glass, please see the general instructions in § 3.7, and consult our technical department for guidance. We accept no liability in the event of thermal breakage of SGG COOL-LITE SKN.
- Toughened SGG COOL-LITE SKN II coated glass can also be requested for safety reasons, or to comply with regulations in any particular country.
- For projects, we advise the carrying out of a “heat-soak” test of tempered glass, according to the European standard EN 14179 (see § 3.8.). The purpose of the “heat-soak” test is to reduce the risk of breakage due to the possible presence of nickel sulphide inclusions in the glass.
- Gas fired heat soak test furnaces are not suitable for soaking SGG COOL-LITE SKN II coatings.

For projects, we advise the carrying out of a “heat-soak” test of tempered glass, according to the European standard EN 14179 (see § 3.8.). The purpose of the “heat-soak” test is to reduce the risk of breakage due to the possible presence of nickel sulphide inclusions in the glass.

2- TRANSPORT, RECEIPT, STORAGE AND HANDLING

2.1. Transport

- Coated glass sheets are usually transported in 2.5 tonnes packs measuring 6000 mm x 3210 mm (jumbo or PLF sizes).
- Glass sheets must be transported vertically (at 3 - 7 degrees).
- The individual sheets are packed with the coated side towards the inside of the frame, unless otherwise requested by the customer.
- The glass panes never come into direct contact with each other:
  - the jumbo glass sheets (PLF) are always separated by powder (e.g. Lucite, Separol...);
  - in each pack of PLF, a clear float glass pane SGG PLANILUX is placed as the first pane during loading to protect the coating on the first pane of SGG COOL-LITE SKN II .
- The pack and its contents must be protected from water.
- SGG COOL-LITE SKN II coated glass on frames is delivered sealed (with adhesive tape to provide protection from moisture). The guaranteed storage time depends on the type of packing. Please refer to § 2.3.2 for maximum storage times.
- The sealed glass should remain closed until the product is used in the factory.
- During transport, violent and repeated shocks should be avoided.
- When handling with a hoisting apparatus, measures must be taken not to damage the pack.

2.2. Receipt of the delivery

- Care must be taken that the position of the coating is that which has been ordered - it can be either on the inner face or the outer face of the glass sheet on request. Labels are never placed on the coating.
- Every pack must be opened with care to avoid damage to the glass sheet or the coating (contacts, scratches, etc.). Handling instructions on the packing must be respected, particularly the instructions for opening.
- All deliveries are identified with an identification label providing the following data:
  - Product name
  - CE Marking
  - Dimensions and thickness
  - Number of sheets
  - Net-weight
  - Date and time of production (coating)
  - Bar code and batch number.
  - Bar code of the SGG PLANILUX backing sheet
- Before processing, glass sheets should be checked in accordance with the specifications defined in § 1.4. Any possible defect in the coating must immediately be reported to the supplier, accompanied by the data mentioned on the identification label.
- No claim can be accepted for damages caused during and after processing. Therefore the insulating glass unit manufacturer should ensure that the process is adapted for offline coated glass and that the quality control is relevant to detect any quality problems as soon as possible (see § 3.12." Processing quality checks"). In case of a claim, samples will be required.

Transport, receipt, storage and handling

2.3. Storage

2.3.1. General

All glass products will become stained if they are stored in humid conditions; the iridescence has the appearance of a "rainbow" or milky white coating on the surface of the glass, and is particularly visible on coated glass. SGG COOL-LITE SKN II glass sheets have to be stored vertically (at 3 - 7 degrees) under the following conditions, as for float glass:

- In a dry, well ventilated store, to prevent any condensation on the surface;
- Protected from rain and running water (e.g. any roof leaks must be rectified);
- Never outside or in the open air;
- Protected from wide changes in temperature and humidity levels (store coated glass products far from opening doors).

To avoid condensation on the exposed glass surface and inside the glass pack, it should be ensured that the packs are at a similar temperature to the environment in the storage building before opening sealed packs.

2.3.2. Storage time

- Storage times are as follows from receipt of coated glass into the receiving plant:
  - Unsealed packs: process glass within 2 months of delivery
  - Sealed packs: process glass within 2 months of opening and within 6 months of delivery.
- Once sealed packs have been opened, the shelf life is up to 2 months (dependent upon the length of time expired since receipt – e.g. if glass was received 5 months previously, it will only have 1 month shelf life left). It is therefore important to note when packs were received into the plant. The date of breaking the seal must also be noted on each pack. This is the date from which the unsealed storage time starts. A first in - first out (FIFO) system must be adopted.
- Should a pack be opened and the SGG COOL-LITE SKN II coating exposed, the opened pack should always be covered with a clear float glass sheet to protect the coating.
- Once a SGG COOL-LITE SKN II coated glass sheet is removed from the packing, it must be processed in order to be assembled as soon as possible into an insulating glass unit.

2.4. Handling

- SGG COOL-LITE SKN II coated glass sheets must be handled with dry, clean and soft gloves.
- During handling operations with vacuum cups, make sure that the vacuum cups are silicone free and perfectly clean. Not all solutions are suitable for cleaning vacuum cups; see manufacturer documentation for details. A sheet of interlayer paper (chlorine and acid-free, thin, soft and air-permeable) or suitable sucker caps can also be placed on the coated side, between the vacuum cups and the surface, but care must be exercised as this reduces the vacuum level.
- Each coated glass pane must be released from the next pane before being lifted from the stack. Any relative movement of the coating with the next glass pane must be avoided.
- Automatic unstacking of glass sheets or removal using a glass clamp is possible, but the gripping area should be kept to a minimum and must be removed when cut.
- In case of doubt, the position of the coating must be checked (see § 1.5.1.). Do not place the coating in contact with a rough surface or hard objects.
- Do not place the glass sheet in a horizontal position with the coating on the support.
- The coating must not be wiped with gloves, paper etc.

3- PROCESSING SGG COOL-LITE SKN II

3.1. Handling on the processing lines

- All the recommendations outlined in § 2.4. remain valid.
- Ensure as much as possible that the coating does not come in contact with the guide rollers on the line; the coating is turned towards the operator when facing the line.
- Hoisting and handling instruments, tools and vacuum cups must be kept perfectly clean and silicone free so as not to leave traces on the coating and must be cleaned when necessary.
- Wear dry, clean and soft gloves when lifting the glass sheet manually.
- The coating must be protected from any contact with greasy substances.
- SGG COOL-LITE SKN II is more sensitive to handling damage and deterioration prior to toughening. Some defects are only revealed after toughening (see § 3.7.).

3.2. Edge deletion

- The removal of the coating from the edge of the individual panes is absolutely essential for all SGG COOL-LITE SKN II panes processed into insulating glass units, to achieve secondary seal bond strength.
- The width of the removed coating edge should be adjusted to the depth of the secondary seal - the aim is to ensure that the deleted strip reaches at least the centre of the butyl bead. This bead should not be completely on the coating. For standard insulating glass units, this width must be 7mm as a minimum.
- For SGG COOL-LITE SKN II, edge deletion can be done at the cutting stage or after tempering (or heat-strengthening).
- The edge deleting can be performed with suitable grinding machines either on the cutting table, stand alone or as part of the insulating glass unit line, operating horizontally or vertically, using a normal grinding wheel. The coating may be removed manually or automatically.
- For wide edge deletion, manual grinding or several passes with normal edge deletion equipment can be done. In this case, be aware of the aesthetics of the edge deleted area.
- Take care that grinding dust is sucked away to avoid scratching.
- Any coating trace perpendicular to the glass edge must be totally prevented.
- Check the quality of the edge deletion with a coating tester or visually by placing a sheet of white paper behind the glass.

Processing SGG COOL-LITE SKN II

3.3. Glass cutting

SGG COOL-LITE SKN II glass (before toughening) is cut in the same way as ordinary SGG COOL-LITE SKN glass, but the coating is susceptible to damage during the cutting and edging processes. In particular, the following recommendations have to be respected:

- Any irregularity or damage of the edges of coated glass products must be avoided because it is likely to increase the risk of thermal breakage during the toughening process.
- Position the glass on the cutting table with the coating facing up, so as to prevent damaging it with any residual glass debris or dust on the cutting table.
- SGG COOL-LITE SKN II glass sheets have to be cut by using a light, vaporising cutting oil (e.g. ACECUT 5503). This cutting oil can be used for all other glass types.
- Do not use normal cutting oil suitable for float glass.
- Do not dilute or mix the cutting oil.
- Avoid all excess of cutting oil. The bead must not be wider than 1 cm or the width of the edge-deleted zone.
- Templates can be used but great care must be taken not to scratch the coating. Soft protection (soft tissue or felt) should be placed underneath the template.
- Fine glass splinters on the pane surface should not be wiped off by hand, but blown off by air (dry and oil-free air).
- When stacking cut sizes prior to further processing, separate the panes by either:
  - Special cork pads (recommended)
  - Chlorine-free paper interlayer
  - Foam pads
  - Corrugated cardboard strips.

  This is especially important with glass of different dimensions. Do not use additional separating powder.

The removal of the coating from the edge of the individual panes is absolutely essential for all SGG COOL-LITE SKN II panes processed into insulating glass units, to achieve secondary seal bond strength.

3.4. Edgeworking

Manual/automatic arrissing:

Wet arrissing

It is essential to keep the glass fully wet during the whole arrissing process and to wash the glass immediately after arrissing so that the surplus water is not able to dry on the coated surface.

- Generally carried out using manual cross belts to achieve arrissed edges (minimum 120 grit belts are recommended).
- The top belt should run downwards to minimise grit deposited on the coated surface.
- Horizontal roller backstops can be fitted to ensure consistent pressure and arriss width.
- The glass should be handled with gloves at the edges to avoid damaging the coating.
- Sufficient water flow to lubricate the belts should be available.

Dry arrissing

- For dry arrissing, the above points apply but dust extraction is required during the arriss process rather than water.

Grinding/CNC:

It is possible to grind the coated glass on CNC machines and double edger machines provided that the handling instructions are observed (see § 2.4. and 3.1.) and adaptations of the machines are made (if necessary, contact our technical department).

- The upper drive belt (which is in contact with the coating during grinding) should not be too hard, to prevent the coating from being damaged.

Storage of cut sizes / rest plates after edgeworking:

The best practice is to process, toughen and manufacture cut panes into insulated glass units as soon as possible after cutting. The maximum storage time is 8 hours before toughening the cut size SGG COOL-LITE SKN II.

3.5. Drilling

- The drilling of coated glass can be performed with drilling machines provided that the handling instructions are observed (see § 2.4 and 3.1) and adaptations of the machines are made (if necessary, contact our technical department). SGG COOL-LITE SKN II must be drilled before toughening.
- Ensure that the hole is edge-deleted according to § 3.2.
- The glass should be washed no longer than 30 seconds after the drilling is finished.
- It is advised to clean down the glass after drilling before putting it through a washing machine. This is to avoid contamination of the washing machine with residue from the drilling process, which may cause scratches.

3.6. Washing

- SGG COOL-LITE SKN II glass must also be washed before toughening and before assembly into laminating glass units.
- We recommend the use of the following installation. If the washing installation differs from the one described here, we recommend that tests be carried out to check the washing quality (traces, rings, dust, etc.) and to ensure that the installation does not damage the coating:
  - **Pre-washing area:** Prewash ramp followed by one pair of cylindrical brushes, tap water between 30 and 40°C, preferably close to 40°C, without any detergent.
  - **Washing area:** At least 2 pairs of cylindrical brushes, demineralised water, maximum chloride concentration 3 mg/l, pH value 6 - 8.
  - **Rinsing area:** Demineralised water at room temperature, maximum conductivity should be 20 µS/cm.
  - **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 are perfectly clean and regularly washed and trimmed. This is particularly crucial when washing SGG COOL-LITE SKN II glass sheets before tempering. Failing to do this may cause scratches. Any hard brushes must be lifted.
  - **Drying:** Use an air-blowing installation equipped with clean and regularly maintained filters.
  - **After the drying section:** Anti-static devices should be used after washing to prevent dust deposits on the glass surface.
- Water should be sprayed directly onto the glass, not onto the brushes.
- Ensure that the glass sheet does not stop inside the washing machine. The washed panes should not remain in the washing unit for any length of time, especially not while the brushes are rotating.
- No water must remain on the coated surface after the drying process.
- A UV source can be used to avoid bacteria growth.
- It is strongly recommended that the washing machine is regular cleaned, especially for the brushes and in areas where demineralised water is used. Clean the filters every day, and the tanks every week. For the brushes, steam cleaning gives good results, but do not spray the bristles with high temperature and high pressure water.
- In case of stains on the coated surface, it may be possible to remove them with a soft dry cloth, or a glass cleaning fluid such as Isopropanol, followed by rapid drying, provided this is done carefully and immediately after contamination has occurred.
- For interim stacking of washed panes, use cork pads near the edge of the sheets. Stacking with strips of 2 mm thick polyethylene foam film is also possible.
- Drive rollers (nip rollers) must be kept clean and free rolling in order to avoid marking the coating.

Ensure that the glass sheet does not stop inside the washing machine.

It is strongly recommended that the washing machine is regular cleaned, especially for the brushes and in areas where demineralised water is used.

3.7. Toughening / heat-strengthening of SGG COOL-LITE SKN II

3.7.1. General

SGG COOL-LITE SKN II can be heat-treated to achieve a toughened (or heat-strengthened) coated glass. Indeed the product has to be toughened (or heat-strengthened) before assembly into an insulating glass unit. This special coating can withstand the heat-treating process. During the process, the colour and the spectrophotometric / thermal characteristics change to match the annealed version SGG COOL-LITE SKN (toughening the standard SGG COOL-LITE SKN product is not possible).

3.7.2. Prior to toughening (or heat-strengthening)

As mentioned above, the “to be toughened” product is more sensitive to damage before toughening than after toughening. Special care and attention must be taken at every stage of processing, in particular before and during the toughening process. Please ask our technical department if necessary.

- It is good practice to temper the glass directly after washing. Provided it is stored under conditions as stated in §2.3.1, the glass must be tempered within 8 hours after washing.
- As is the normal case for all toughened glass, notches and holes must be made before toughening (or heat-strengthening); no cutting or edgework may be carried out thereafter.
- All toughened glass should be kite-marked.

3.7.3. Toughening instructions

From a general point of view, toughening of SGG COOL-LITE SKN II can be carried out using appropriately adjusted furnace settings. This will obviously vary depending upon the type of furnace being used. The sheets should be handled as “cold” as possible to achieve a flawless coating after toughening. This means that the temperatures and heating times are set so as just to avoid breakage in the blower box and to meet the requirements for single-sheet safety glass.

- The sheets are always toughened with the coated side upwards, i.e. the glass side to the furnace rollers.
- Radiation furnaces (not recommended for offline coated glass): Using a standard radiation-only furnace, coated glass will tend to bend strongly in the early heating stage due to the different speeds at which the glass surfaces heat up. However, acceptable quality can be achieved at the expense of cycle time.
- Furnaces with convection (heating balance): As soon as an air balance system with a convection portion is used, the quality and the cycle time will improve. The following basic settings represent a starting value as a basis for further toughening trials (these can fluctuate depending on the equipment, glass dimensions and loading area):
  - Heating time:

Heating time	Medium flow	High flow (cold or hot air)	Full convection
Seconds per 1mm of glass thickness*	65-70	45-60	30-45

** Example: for a 6mm glass, these durations must be multiplied by 6*

  - Set point furnace temperature: the top temperature of the furnace must be lower than 700°C (close to 690°C).
  - Air injection system: use the maximum capacity of the air flow during 75% of the heating time. Set it with the Zebra optical control.
  - Note: the high convection furnaces give much shoter cycle times as well as improved optical quality of the end-product.
- The furnaces require frequent cleaning; any dust (e.g. coming from arrissed edges or from enamelled or screen-printed glass) will increase quality defects like dust bands.
- Do not use SO_2 in the furnace when tempering SGG COOL-LITE SKN II. Do not temper this product straight after tempering with SO_2 injection. It is recommended to wait at least 48 hours after use of SO_2 as residual SO_2 may attack the coating.

3.8. Heat-soak testing SGG COOL-LITE SKN II

Heat-soaking toughened SGG COOL-LITE SKN II pieces must be carried out in accordance with the European standard EN 14179. Every piece must be individually separated; the separating blocks should only make contact with the deleted edge of the glass. Gas fired Heat-Soak Test furnaces must not be used for SGG COOL-LITE SKN II coatings.

3.9. Handling of Heat-Treated Glass

- Following toughening / heat-soaking or heat-strengthening, each pane should be interleaved using a special offline coating compatible chlorine-free paper, or separated with pads as with cut sizes. It is also possible to stack the individual panes with polyethylene cling film or polyethylene foam film. Particular care should be taken with this in the case of different glass dimensions.
- Glass panes must be stored vertically (at 3 - 7 degrees) under the following conditions:
  - In a dry, well ventilated store, to prevent any condensation on the surface;
  - Protected from rain and running water (any roof leaks must be rectified);
  - Never outside or in the open air;
  - Protected from wide changes in temperature and humidity levels (store coated glass products far from opening doors). To avoid condensation on the exposed surface and inside the glass pack, it should be ensured that the packs are at a similar temperature to the environment in the storage building.
- Clean, dry and ungrained gloves must be worn for all handling.
- Assemble the panes into insulating glass units as quickly as possible.

3.10. Laminated glass

For laminating SGG COOL-LITE SKN II coated glass, please consult our technical department.

3.11. Manufacture of insulating glass units

When manufacturing insulating glass units using SGG COOL-LITE SKN II, please follow the handling, cutting, edge-deletion and washing instructions detailed above.

- The coating should always face outwards on the production line to avoid contact with the guide rollers.
- All types of secondary seal can be used (polyurethane, polysulfide, silicone and hot melt).

Gas fired heat soak test furnaces must not be used for SGG COOL-LITE SKN II coatings.

3.12. Processing quality checks

It is the responsibility of the processing plant to define and adjust the quality process control, to match the quality standards acceptable for its own market and in respect of relevant national requirements.

- **Receipt of glass:**
  - Control of delivery documents of the coated glass supplier.
- **After cutting / edge-deletion:**
  - Visual aspect control (scratches, oxidation/corrosion, splinters etc.).
  - Visual checking of edge-deletion (width, straightness, cleanness). Checking of the accuracy (i.e. all coating removed) can take place optically by placing a piece of white paper behind the pane or by electrical resistance measurement.
  - Normal checking of the cutting quality.
- **After grinding / drilling / washing:**
  - Visual aspect control (scratches, oxidation/corrosion, splinters etc.).
  - Visual control as to whether the pane is completely dry.
  - Check for sucker or cork pad marks etc.
  - Normal control of the grinding / drilling quality.
- **Prior to toughening (or heat-strengthening):**
  - Check for glass splinters (if present, remove them carefully by blowing or rewashing).
- **After toughening (or heat-strengthening):**
  - Visual aspect control (burns, cracks, scratches, oxidation/corrosion, rollerwave, red haze etc.): use an artificial sky according to the standard EN 1096-1.
  - Colour consistency.
  - Optical quality (distortion, bow etc.).
  - Visual detection of rollerwave.
  - Normal control of the toughening quality (break pattern etc.).
- **After heat-soak testing:**
  - Visual aspect control (scratches, oxidation/corrosion, splinters etc.): use an artificial sky according to the standard EN 1096-1.
  - Check that no damage has been caused by separating blocks.
- **On the insulating glass unit line:**
  - Visual aspect control in conformity with the relevant national quality standard for insulated glass units.

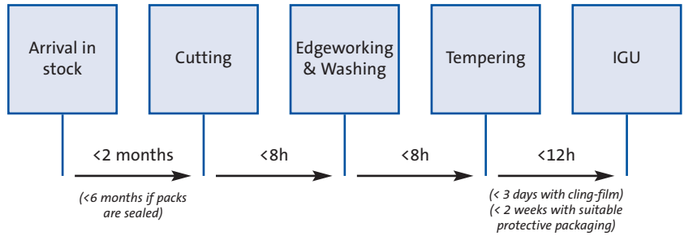
For plants just starting to use offline coated glass products, a system of “first off” inspection after each process can be useful until experience is gained. Operator training and experience in identifying faults (which are often difficult to see, especially before toughening) is important. A “fault library” showing typical defects should be created.

3.13. Environment, health and safety issues

- The SGG COOL-LITE SKN II coated glass product can be disposed in the same way as clear float glass.
- As for the grinding process, the edge deleting and edge working residues have to be continuously and completely collected during the grinding process. These residues must be further treated in compliance with national legislation about industrial waste. Please contact your grinding wheel manufacturer for further information.
- As for any dust coming from the grinding process, any inhalation or skin contact of these residues must be avoided.

3.14. Processing Time Line

The “Processing Time Line” below is an overview of the most important times to watch when processing SGG COOL-LITE SKN II coated glass. The information is not exhaustive; please see the relevant paragraphs in this section for more detailed information.



4- GLAZING

The selection of a suitable and practical 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.

Glass sheet blocks, rebate dimensions and admissible deflection of frames for insulating glass units are not specific to SGG COOL-LITE SKN II glass products.

5- PROTECTION, CLEANING AND MAINTENANCE OF THE END-PRODUCT

5.1. Protection of the glazing during building works

As for other glass products, it is important to respect the following instructions for insulated glass units with the SGG COOL-LITE SKN II coated glass product:

- In order to avoid damaging the glass with aggressive contaminants from site-works (e.g. paint, plaster, mortar), it is recommended that the double-glazed units are installed after all other work on site has been completed.
- Minimise, as far as possible, the amount of time that the glass is stored on site prior to installation.
- Follow the usual recommendations: store in a dry, well-ventilated location, protected from adverse weather conditions and variations in temperature and humidity.
- Avoid splashes of concrete, plaster, mortar residues as much as possible. To prevent a chemical attack on the glass, such substances must be removed from the glass immediately. It is recommended that the glass is cleaned as soon as it is installed.
- If other works are being carried out in close vicinity to the window installation, protect the glass with a clean plastic sheet 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.

5.2. Cleaning and maintenance

Cleaning and maintenance instructions of insulating glass units with the SGG COOL-LITE SKN II product are identical to those of a standard insulating glass unit.