TITLE
SGG SECURIT

SUBTITLE
Toughened safety glass

DESCRIPTION
SGG SECURIT is a thermally toughened safety glass. The toughening process provides a significantly increased resistance to mechanical and thermal stresses than conventional annealed glass. If the glass breaks, it fragments safely into small pieces with dulled edges.

RANGE
If no information is given as to the type of glass used for producing SGG SECURIT, the base product is assumed to be SGG PLANILUX clear glass. Otherwise the name of the base product is added after the name SGG SECURIT (for example: SGG SECURIT made using SGG PARSOL GREEN is called SGG SECURIT PARSOL GREEN. Most SAINT- GOBAIN GLASS products can be toughened or are available in a toughened version, except for:

Blown glass or certain drawn glasses (SGG SAINT- JUST) - SGG PLANILAQUE and SGG CREA- LITE
Certain references in the SGG DECORGLASS range
Products for which toughening intrinsically changes the characteristics and/ or performance of the product (e.g. the toughened versions of SGG STADIP and SGG STADIP PROTECT glass have different levels of resistance to certain types of impact from the non- toughened versions).
SGG SECURIT is available in all thicknesses from 4 to 19 mm. The maximum sizes are given in the table at the bottom of the page.

SGG SECURIT Heat- Soak Testing
To reduce the risk of toughened glass spontaneously breaking due to the presence of critical nickel sulphide (NiS) inclusions in the sheets of glass, it is advisable to put the toughened glass through an additional heat treatment known as the Heat- Soak Test (BS EN 14179). This is a desructive test which eliminates the majority of glass that is at risk. However in its current state the technique cannot eliminate 100% of the glass which is at risk. The risk of spontaneous breakage is however considerably reduced.

This treatment is recommended for all situations where the stability of the structure, the maintenance of the barrier and the safety of users may be at risk from breakage of the toughened glass.

SGG SECURIT range

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PERFORMANCE
• **Impact resistance**: Its enhanced impact resistance enables an 8 mm sheet of SGG SECURIT glass to withstand a 500g steel ball dropped from a height of 2m. For comparison, the same ball dropped from a height of 0.3 m would break 8mm annealed glass. SGG SECURIT has been tested in accordance with BS EN 12600 (pendulum test).

• **Bending strength**: SGG SECURIT is significantly more resistant to flexural stresses than conventional annealed glass. This resistance is characterised by a bending strength in the region of 120 MPa (BS EN 12150).

• **Resistance to thermal stress**: SGG SECURIT can withstand temperature differences of up to 200°C. For comparison, this temperature is around 30°C for ordinary annealed glass.

PROCESSING CAPABILITIES
SGG SECURIT can be:
Sandblasted or acid etched (the maximum permitted stress will differ from that of non- treated products)
Drilled and notched: these operations must be performed before toughening treatment (see below).
Coated with a solar control coating (SGG SECURIT ANTELIO, SGG SECURIT COOL- LITE), a low- emissivity coating (SGG SECURIT PLANITHERM TOTAL) or a self- cleaning coating (SGG SECURIT BIOCLEAN)
Laminated (SGG STADIP SECURIT)
Assembled into a double- glazed unit (SGG CLIMALIT SECURIT or SGG CLIMAPLUS SECURIT)
Enamelled (SGG EMALIT EVOLUTION)
Screen- printed (SGG SERALIT EVOLUTION).
Glass- to- metal contact is prohibited. Cylindrical parts and the edges of notches are not suitable to bear high stresses.
The toughening process of SGG SECURIT can introduce a degree of optical imperfection into the glass in the form of bow or roller wave distortion. These are inherent to the manufacturing principle and cannot be considered as a defect (see BS EN 12150).
SGG SECURIT processing characteristics

Tolerances on thicknesses are the same as for SGG PLANILUX.
Tolerance on flatness:
Overall bow = 0.003mm/ mm
Local bow = 0.5mm/300mm

Edgeworking

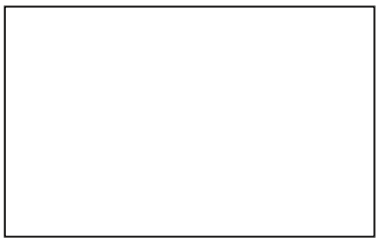
SGG SECURIT edgeworking is carried out before toughening. This glass cannot be cut or edgeworked after the toughening process.

The following standard edgework can be performed:
Bevelled edge or arrised edges
Ground or smooth ground edge
Smooth ground or flat
Polished edge
Bevel
Drilled holes have a ground edge finish as standard. Larger apertures can be smoothed or polished. Other edgeworking is available on request.

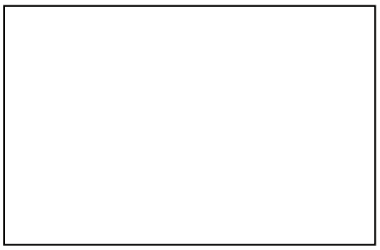
Drilling

The minimum hole diameter must be equal to the glass thickness (t). In addition, the maximum diameter (Ø) (or the total of the Ø) must be:
l/4 of the width of the sheet for SGG SECURIT t ≤ 6 mm
l/3 of the width of the sheet for SGG SECURIT t = 8, 10 and 12 mm.

Rules for the positioning of holes
Holes with Ø ≤ 40 mm Comply with the minimum distances in the drawing below.

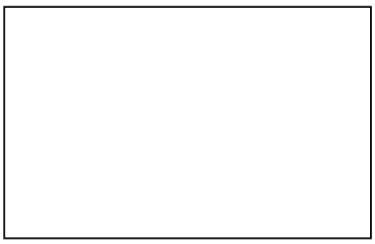


Holes with Ø > 40 mm (fig 2) Comply with the minimum distances in the drawing below.



Tolerances on the hole position

Tolerances on hole position
Side less than 1 m: ± 2 mm
Sawn holes
Holes linked to the edge by a cutting line.
5 mm ≤ d ≤ 2 t



Tolerances on the hole position
Rectangular or square holes
X ≥ A/2 and Y ≥ B/2
For SGG SECURIT 6 mm :
A ≤ l/4 and B ≤ w/4
For SGG SECURIT 8 mm :
A ≤ l/3 and B ≤ w/3
r ≥ 10 mm

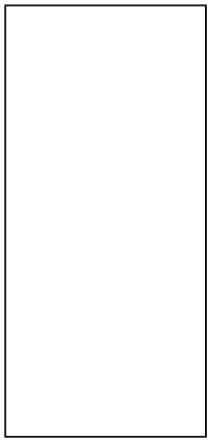
Tolerance on sizes

Side 5 to 50 mm: ± 1 mm
Side 51 to 100 mm: ± 2 mm
Tolerances on hole position

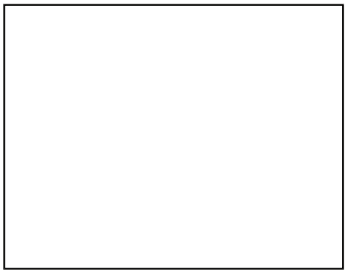
Tolerance on positioning: ± 1.5 mm
Notes

When the outer edges of the accessory are aligned with the edges of the glass, the clearance between the inner part of the accessory and the glass must always be between 4 mm (maximum) and 1 mm (minimum).
• Rules for position of notches (see fig. 5)

Y1 ≤ X1 and Y1 ≤ X2 : the height of a notch must not exceed its width.
b ≥ X1/2 : the distance between two notches must be at least half the width of the largest notch.
a≥ X1/2 and a ≥ 100 mm : the distance between the notch and the edge of the glass must be at least half the width of the notch, and this distance must be greater than 100 mm (see fig. 6). R ≥ t : the radius of the notch must be at least equal to the thickness of the glass.



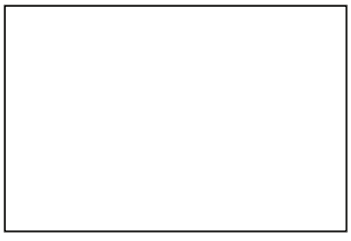
• Rules for position of angled notches
(see fig. 7)
X ≤ B/3 and X ≤ 200 mm
Y ≤ H/3 and Y ≤ 200 mm
The width of the notch must not exceed 1/3 the width of the sheet of glass. For flat toughening, the width or height of the notch must not exceed 200 mm.
• Tolerances on notch position
Tolerance on positioning: ± 2 mm



Special cases
• Trapezoidal sheets
Do not exceed the length/ width ratio < 8
where width = (A + B) / 2 and B must be at least 250 mm

• Acute angle sheets
The same rules as for trapezoidal sheets apply.

Section B (above) cannot be notched, sometimes known as "shortened corner", and is measure in the following way (in mm):
IF Y = the acute angle, (expressed in degrees)
Y ≤ 65° : B min = 18 - 0.2 x Y
Y > 65° : B ≥ 5 mm
The guidance given above is indicative and final manufacturing confirmation should be sought from the supplying branch.



For sizing complying with current national regulations, see "Determining the thickness of glass". For SGG SECURIT DECORGLASS and SGG SECURIT MASTERGLASS patterned glass, the size and choice of thickness must consider the depth of the pattern on the chosen reference. In some cases, the presence of a deep design will require a thicker glass. SGG SECURIT complies with the requirements of standard BS EN 12150. SGG SECURIT bears permanent marking indicating the processing site and the relative EN standard BS EN 12150. SGG SECURIT glass carries the relevant CE marking as required.

PRODUCTAPPLICATION

• Doors:SGG SECURIT can be used for various types of internal and external glazed doors.
• **Glass assemblies**: the sheets of glass are joined together using metal elements to create glass assemblies for the following applications:
- Doors
- Shop windows
- Commercial entrances.

• **Interior furniture**:SGG SECURIT is required for use in table tops, shelving, furniture etc. in the home to reduce the risk of breakage and injury.
• **Street furniture**: telephone boxes, bus shelters, signs etc. can also be built using SGG SECURIT.
• **Facades, overhead glazing, spandrelpanels**: some applications require the use of SGG SECURIT toughened glass for safety reasons or to provide resistance against thermal and mechanical stresses.

ADVANTAGE

• **Fragmentation** : if the glass breaks, SGG SECURIT considerably reduces the risk of injury as it fragments into small pieces with dulled edges.

• **Increased resistance to mechanical stresses**: the impact resistance and bending strength of SGG SECURIT is 5 times that of ordinary annealed glass of the same thickness.

• **Increased resistance to thermal stresses**: SGG SECURIT provides greater resistance to thermal stresses than SGG PLANILUX annealed glass.

• **Large glass assemblies**: SGG SECURIT, joined together using metal elements, can be used for large glazed areas, to minimise the appearance of support structures.

• **Transparency**:SGG SECURIT doors help improve lighting in corridors or rooms that are far from external windows. SGG SECURIT has the same spectrophotometric properties as the base product of the same thickness, prior to undergoing heat treatment.

GUIDELINE

SGG SECURIT glass must always be installed in accordance with current national standards and regulations.
The design of an SGG SECURIT assembly must comply with the following guidelines:
Attach SGG SECURIT to the structure and ensure the assembly is rigid using wind bracings, or if necessary metal tie rods
Ensure the sheets of glass are fully joined together. The installation must withstand all the stresses in the various planes
Provide sufficiently strong hinges and cross bars to support the glass
Check the thickness of ceilings or floors for the installation of closers, anchoring flanges etc.
Breaking one sheet must not result in all or part of the rest of the installation falling if the height of the installation is less than 3m. For installations higher than 3m, the simultaneous breaking of 2 sheets mustnot resulting in all or part of the rest of the installation falling.
The interfaces, support conditions and installation conditions all have a major influence on the maintenance of the mechanical properties of SGG SECURIT glass. For this reason, SAINT- GOBAIN GLASS has a wide range of parts and accessories for creating combinations and to ensure that the assembly is long- lasting.
Wind bracing
SGG SECURIT assemblies frequently require wind bracing. This ensures the resistance, rigidity and stability of structures and only bears the forces exerted in their plane of inertia. (see fig. 9)
A- High (or low) wind bracing in one sheet.
B- Wind bracing across the whole height in two sheets (or more) on one side or overlapping. Minimum width: 30 cm.
C- Wind bracing across the whole height in one sheet on one side or overlapping. Minimum width: 30 cm.

In all cases, the parameters in the table for the range and the manufacturing instructions regarding edgework must be complied with.
SGG SECURIT assemblies must be fitted with wind bracing in the following cases. If either of the dimensions AR or BR are < 30 cm, wind bracing will not be necessary, regardless of the other dimensions.

Installations with doors

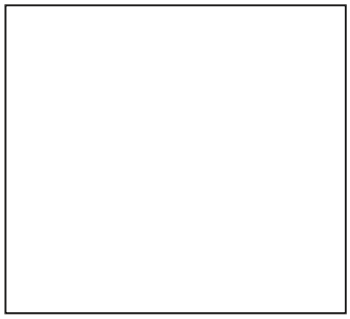
• **Transom in several parts**

Add wind bracing if:
- Metal glazing bead AR + BR > 140 cm
- Exposed anchors
- Cement housing AR + BR > 160 cm

• 1- piece transom

Add wind bracing if:
- Metal glazing bead AR + BR > 160 cm
- Exposed anchors
- Cement housing AR + BR > 180 cm

Installation without doors



Add wind bracing if:
AP + BP > 350 cm

Installation extended with non- toughened glass

Wind bracing must be used:
• Clearance in the base of channels: ≤ 5 mm
• Clearance between sheets of glass:
- Fixed: ≤ 3 mm
- Moveable: 2 mm
• Door clearance:
- Laterally: 2 mm
- At the bottom: 7 mm
- At the top:
    - Ordinary door: 3 mm
    - Folding door: 7 mm