

SGG STADIP® / SGG STADIP  
PROTECT®

*Laminated safety and security  
glass*

Technical Sheet  
United Kingdom

# SGG STADIP® / SGG STADIP PROTECT®

## *Laminated safety and security glass*

### Description

Laminated safety and security glass, SGG STADIP or SGG STADIP PROTECT, comprises two or more sheets of glass bonded together with one or more interlayers of polyvinyl butyral (PVB) film.

SGG STADIP glass incorporates a single PVB sheet with a nominal thickness of 0.38 mm, distinguishing it from SGG STADIP PROTECT glass which has a minimum thickness of 0.76 mm. Laminated glasses with different levels of safety and security can be obtained by varying the number and/or thickness of each of the components.

If the glass breaks, the fragments of glass are held in place by the PVB interlayer(s). In fully framed installations the broken glass retains a residual strength while awaiting replacement.

### Applications

#### ***Protection against injury***

If the glass breaks, the fragments of glass remain bonded to the interlayer. This safety feature, which is often mandatory (for example: in public buildings, schools, creches, etc), is also ideal for residential buildings, where it protects the occupants.

The use of glass in roofs must meet safety, enhanced thermal insulation and solar protection requirements. Safety is ensured by the use of a laminated safety or security glass (inner leaf of the overhead glazing). If an object falls onto the glazing, SGG STADIP PROTECT may prevent the object from passing through the glass and also minimises the risk of fragments falling into the space below.

Depending on the composition, SGG STADIP PROTECT laminated security glass ensures that structures conform to the regulatory requirements for overhead glazing.

#### ***Guarding and balustrading***

SGG STADIP or SGG STADIP PROTECT laminated safety glass has:

- Residual stability in the event of breakage
- Retention of the object which caused the glass to break (depending on the required safety and security level) providing that it is accurately sized, installed, supported adequately and that it complies with current regulations and requirements (BS EN12600).

The main areas in which laminated safety and security glass is used are: guarding, glazed partitions and sloping glazing.

#### ***Protection against vandalism and burglary***

SGG STADIP PROTECT laminated security glass, installed in an appropriate frame, can be an important deterrent to ensure the security of property and occupants in a building.

- SGG STADIP PROTECT SP laminated security glass contributes to the security of businesses and offices.

Combined with additional protection, if required, this glass can be used in shop windows and doors, entrance doors and windows in offices appropriate to the specified levels of protection.

- The level of the risk and the regulatory requirements determine the necessary level of protection and thus the type of SGG STADIP PROTECT or SGG STADIP PROTECT SP laminated security glass to use. This selection is determined by the type and value of the property to be protected, the type of building (for example: building which is easy or difficult to access, private house, etc) and its location (for example: isolated premises, high-risk area, etc).

The risk must be assessed on a case by case basis and must take any insurance specifications into account.

#### **Protection against firearms**

SGG STADIP PROTECT bullet-resistant laminated security glass provides protection against armed attack (e.g. financial institutions, banks, guardrooms, official or military units, etc).

The No Splinters (NS) or minimal spall version protects against injury from splinters of glass, which may fly from the rear surface of the glass upon attack.

SGG STADIP PROTECT HS protects against bullets from handguns and rifles. SGG STADIP PROTECT HC glass protects against shotgun fire.

SGG STADIP PROTECT FS combines bullet resistance (against certain firearms) with protection against vandalism and burglary. This glass is therefore suitable for multifunctional applications requiring safety, security and protection.

#### **Protection against explosions**

Minimising the consequences of an accidental or criminal explosion involves the use of glass which protects against the pressure generated by the explosion. For industrial use, any premises located in hazardous areas should use a SGG STADIP PROTECT BS type glass.

#### **Protection against noise**

Products in the SGG STADIP range have acoustic insulation properties. They can be used in any applications requiring acoustic insulation.

SGG STADIP SILENCE laminated acoustic and safety glass can be used in applications where high acoustic insulation is essential (e.g. interpreting booths, residential areas in close proximity to airports, towns or city centres, railway lines or motorways, etc), without compromising the safety performance.

#### **Protection against UV light**

The PVB interlayer in the SGG STADIP and SGG STADIP PROTECT range filters most UV rays. It can be used to reduce the discoloration of items inside a building that are exposed to direct sunlight. (e.g. shop window displays, curtains, carpets, conservatories etc).

#### **Glass floor panels**

SGG LITE-FLOOR is a laminated safety glass which has been specially designed and sized for use in floors.

*Note: The behaviour of the polyvinyl butyral (PVB) interlayer varies with temperature. SGG STADIP and SGG STADIP PROTECT are mechanically stable in a temperature range between 10°C and 45°C, inside the glass assembly.*

## Range

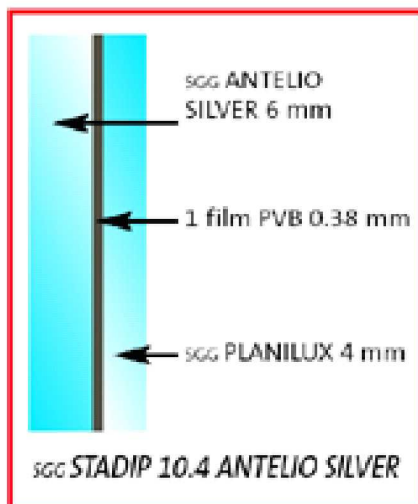
The standard SGG STADIP and SGG STADIP PROTECT range comprises two or more leaves of SGG PLANILUX clear glass. Other glass products can, however, be incorporated:

- SGG DIAMANT extra clear glass
- SGG PARSOL body-tinted glass - Solar control glass from the SGG COOL-LITE or SGG ANTELIO ranges
- SGG PLANITHERM low-emissivity glass
- Certain SGG DECORGLASS or SGG MASTERGLASS patterned glasses. In these cases, the name of the product is added after the SGG STADIP or SGG STADIP PROTECT brand name.

#### **Example**

SGG STADIP 10.4mm ANTELIO SILVER consists of 6 mm SGG ANTELIO SILVER solar control glass, 4 mm SGG PLANILUX glass and a 0.38 mm thick PVB interlayer.

The PVB interlayers are available in various colours: clear, diffused or coloured (see SGG STADIP COLOR).



*SGG STADIP: protection against injury*

- Composition: laminated glass with a single 0.38 mm thick PVB interlayer.
- Name:

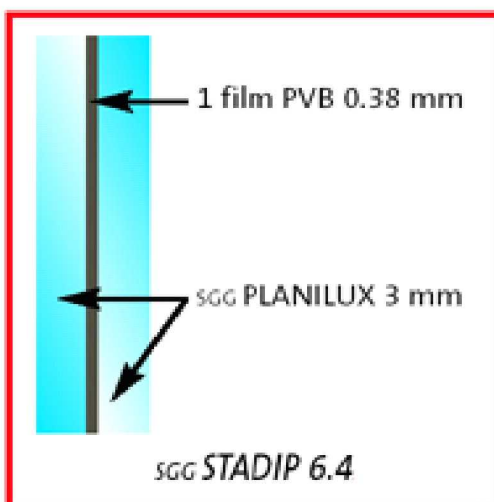
SGG STADIP XX.1

Where: - X represents the nominal thickness of a sheet of glass;

- The number 1 following the fullstop indicates the presence of a single 0.38 mm thick PVB interlayer.

In the UK, the total thickness of the laminated assembly is denoted to a single decimal point, thus allowing for the overall thickness of the PVB interlayers. E.g. 6.4mm = 2 x 3mm SGG PLANILUX + 1 x 0.38mm PVB.

**Example**



**SGG STADIP PROTECT: protection against people falling and basic protection against vandalism and burglary**

- Composition: laminated glass with at least two 0.38 mm thick PVB interlayers or one 0.76 mm interlayer.

- Name:

SGG STADIP PROTECT XX.Y

Where: - X represents the nominal thickness of a sheet of glass;

- Y indicates the number of 0.38 mm thick PVB interlayers:

Y ≥ 2 – As above for the UK.

SGG STADIP PROTECT			
Protection against people falling			
Class BS EN 12600	SGG STADIP	Thickness (mm)	Weight (kg/m <sup>2</sup> )
2B2	6.4	6.4	15
1B1	PROTECT 6.8	7	16

SGG STADIP PROTECT		
Protection against vandalism and burglary		
Class BS EN 356	Thickness (mm)	Weight (kg/m <sup>2</sup> )
P1A	6.8	16
P2A	8.8	21
P3A	9.1	21
P4A	9.5	22

**SGG STADIP PROTECT SP: enhanced protection against vandalism and burglary**

- Composition: a number of glass components assembled using several 0.38 mm or 0.76 mm thick PVB interlayers.

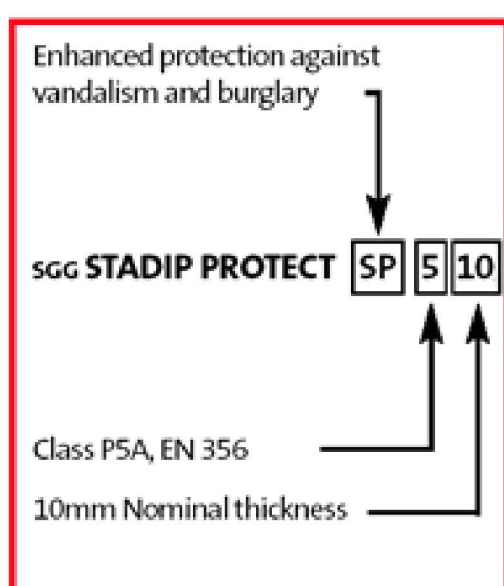
- Name:

SGG STADIP PROTECT SP XYY

Where: - X defines the class of the corresponding European standard (BS EN 356);

- YY defines the total thickness of the glass in mm.

SGG STADIP PROTECT SP			
Protection against vandalism and burglary			
Class BS EN 356	SGG STADIP PROTECT	Thickness (mm)	Weight (kg/m <sup>2</sup> )
P5A	SP 510	10	23
P6B	SP 615	15	34
P7B	SP 722	22	51
P8B	SP 825	25	53



*SGG STADIP PROTECT HS, HC and FS: protection against firearm attack*

- SGG STADIP PROTECT HS (High Security) glass provides protection against fire from handguns and rifles as defined by standard BS EN 1063 for classes BR (i.e. with the exception of shotguns).
- SGG STADIP PROTECT HC (High Calibre) glass provides protection against fire from shotguns (classes SG1 and SG2).
- Composition: a number of glass components, often of different thicknesses, assembled using several 0.38 mm or 0.76 mm thick PVB interlayers.
- Name : SGG STADIP PROTECT HS XXX (N)S  
Where: - X defines the class of the corresponding European standard (BS EN 1063) (for example: 1 for BR1)  
- YY defines the total thickness of the glass in mm  
- NS or S stands for no-splinters or splinters, indicating whether an anti-spall layer has been added.

SGG STADIP PROTECT HS			
Protection against fire arm attack			
Class BS EN 1063	SGG STADIP PROTECT	Thickness (mm)	Weight (kg/m²)
BR1 S	HS 133-S	13	31
BR1 NS	HS 120-NS	20	48
BR2 S	HS 219-S	19	44
BR2 NS	HS 234-NS	34	83
BR3 S	HS 323-S	23	53
R3 NS	HS 349-NS	49	119
BR4 S	HS 431-S	31	73
BR4 NS	HS 454-NS	54	130
BR5 S	HS 536-S	36	82
BR5 NS	HS 558-NS	58	140
BR6 S	HS 647-S	47	112
BR6 NS	CP-HS 673-NS	73	149
BR7 S	CP-HS 783-S	83	176
BR7 NS	HS 787-NS	87	205

SGG STADIP PROTECT HC			
Protection against fire from shotguns			
Class BS EN	SGG STADIP PROTECT	Thickness (mm)	Weight (kg/m²)
SG1 S	HC 133-S	33	75
SG1 NS	HC 171-NS	71	171
SG2 S	HC 247-S	47	114
SG2 NS	CP-HC 284-NS	84	177



- STADIP PROTECT FS (Full Security) glass also has, in addition to its bullet-resistant classification, (standard BS EN 1063), an anti-vandalism and anti-burglary classification (standard BS EN 356). This glass is suitable for multifunctional applications, combining protection against firearms, anti-vandalism and burglary.
- Composition: a number of glass components, often of different thicknesses assembled with several 0.38 mm or 0.76 mm thick PVB interlayers.

SGG STADIP PROTECT FS			
Protection against firearm attack and Protection against vandalism and burglary			
Class BS EN 356 and 1063	SGG STADIP PROTECT	Thickness (mm)	Weight (kg/m <sup>2</sup> )
P6B+BR5-S+SG1-S	FS 651.34-S	34	81
P7B+BR5-S+SG2-S	FS 752.40-S	40	90
P8B+BR6-S+SG2-S	FS 862.41-S	41	92

**SGG STADIP PROTECT BS: protection against explosions**

SGG STADIP PROTECT BS (Blast Security) glass has been tested in accordance with the 4 categories of standard BS EN 13541. SGG STADIP PROTECT BS laminated safety glass is available in a splinter version (S, fragments of glass scattered by the explosion) or no splinter/no spall version (NS, no dangerous fragments of glass scattered by the explosion).

SGG STADIP PROTECT BS			
Protection against explosions			
Class EN 13541	SGG STADIP PROTECT	Thickness (mm)	Weight (kg/m <sup>2</sup> )
ER1 S	BS 110-S	10	22
RE1 NS	BS 118-NS	18	40
ER2 S	BS 218-S	18	39
ER2 NS	BS 226-NS	26	63
ER3 S	BS331-S	31	73
ER4 S	BS427-S	27	68
ER4 NS	BS 433-NS	33	83

**SGG STADIP SILENCE: Protection against noise**

SGG STADIP SILENCE acoustic laminated safety glass offers enhanced acoustic insulation. Its mechanical properties are identical to the rest of the SGG STADIP and SGG STADIP PROTECT range, providing the same level of protection as standard laminated safety and security glasses.

**SGG LITE-FLOOR: glass floor panels**

The high mechanical strength of SGG STADIP glass means that it can be used in structural applications, such as floors. Incorporated into the SGG LITE-FLOOR system, it is specifically designed to bear the loads required for the application.

## Processed Product Variations

Glass in the sGG STADIP and sGG STADIP PROTECT ranges can be\*:

- Edgeworked after assembly, providing it does not comprise any toughened or heat-strengthened components
- Sandblasted or acid etched
- Heat-strengthened (sGG PLANIDUR), toughened (sGG SECURIT) or heat soak tested (sGG SECURIPOINT). The components must be heat-treated before laminating
- Drilled and notched: The individual components are best processed prior to laminating where practical.
- Coated with a solar control coating (sGG STADIP ANTELIO, sGG STADIP COOL-LITE), or a low-emissivity coating (sGG STADIP PLANITHERM)
- Assembled into double-glazing (sGG CLIMALIT SAFE, sGG CLIMAPLUS SAFE, sGG CLIMALIT PROTECT, sGG CLIMAPLUS PROTECT, sGG CLIMALIT SILENCE, sGG CLIMAPLUS SILENCE).

*\* Certain treatments may alter the mechanical properties of the product and modify its classification.*

sGG STADIP SILENCE glass is processed in the same way as the rest of the sGG STADIP and sGG STADIP PROTECT ranges.



*Private Residence - Brussels, Belgium*

## Installation Guidelines

- All the products described above must be installed in accordance with current national standards and regulations and our own installation instructions. Unless gasket glazed into a drained and ventilated system, particular care must be taken to protect the PVB interlayer against water ingress. Prolonged contact with water can cause the interlayer to swell and ultimately lead to delamination.
- The interlayer should be protected from contact with unsuitable mastics and sealants containing mineral or vegetable oils and unsuitable glazing compounds such as acid curing silicones. Only use products classified as suitable for PVB laminated by the manufacturer. In case of doubt always check compatibility.
- For all installations, a thermal safety risk analysis is necessary to ensure that the sGG STADIP and sGG STADIP PROTECT glass is not susceptible to break as a result of thermal stress. In order to minimise this risk, locating heat generating devices close to the glazing should be avoided (e.g. spotlights, radiators and convectors which could cause a localised rise in temperature). Similarly, no screens or films should be applied to the glass (posters, signage, adhesive lettering etc).
- sGG STADIP and sGG STADIP PROTECT glass should not be exposed to temperatures of more than 60°C before and post glazing.
- When incorporated into double-glazing, the laminated glass can be positioned on the inner or outer pane of the unit, depending on the specific safety/security requirements of the application.
- To provide enhanced protection against vandalism, burglary, firearms and explosions, sGG STADIP PROTECT glass must be used with the appropriate framing systems. Reference from the standards must be made, depending on the level of protection required, to ensure that the performance of the frame used is fully compliant.



Type of protection	Standard
Against vandalism and burglary	BS EN 1627
Against firearm attacks	BS EN 1522 and BS EN 1523
Against explosions	BS EN 13123-1 and BS EN 13124-1

## Standards and Regulations

Products in the sGG STADIP and sGG STADIP PROTECT ranges comply with standards BS EN 12543 and BS EN 14449. They will receive CE marking when it is officially in force.

In the context of CE marking, the sGG STADIP PROTECT compositions may be subject to modification. Please consult our website [www.saint-gobain-glass.com](http://www.saint-gobain-glass.com) to find the final details once it is officially in force.