selectaglaze™

By Appointment to
Her Majesty The Queen
Manufacturer and Supplier
of Secondary Glazing
Selectaglaze Ltd.
St. Albans

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April 2013

SELECTAGLAZE
secondary glazing

protecting your environment

Enhanced Window Security Using Secondary Glazing Systems

Windows can be a very vulnerable element of a building and are often seen as "soft targets" by terrorists and criminals and this can impact on people's safety and property.

The UK has a vast array of prominent and iconic buildings, particularly in city centres; with a multitude of uses including hotels, government, museums, offices, universities, clubs and, of course, residential, attracting people in large numbers to live, work, study and socialise in these vibrant centres.

Electronic security will warn but not resist so physical security measures are an important part of any plan for protection.

Glass, particularly in period buildings, offers little resistance to attack. It will readily be shattered by a bomb exploding more than 100M away and flying shards will maim and kill. It is also easily broken by an intruder prepared to use force..

Selectaglaze secure secondary glazing systems provide a practical solution. A fully separate window is fitted behind an existing window using robust frames, secure locks and strengthened glass. These can be hinged, sliding or fixed and are designed to fit discretely and sympathetically in contemporary or listed buildings, subject to listed building consent. Buildings needing more significant protection may require reinforcement of the structure to provide adequate fixing points.

Other key benefits offered by secondary glazing include significant levels of noise insulation, enhanced thermal insulation that improves building energy performance and reduced ingress of dust and dirt.

Established in 1966 and a Royal Warrant Holder since 2004, Selectaglaze is the UK's leading designer and producer of secondary glazing.

Security Applications include:
Airports, Banks, Computer Rooms, Control Rooms, Embassies, Government Buildings, Private Homes, Hospitals, Laboratories, Museums, Schools, Transport Links, Telecommunications and Utilities

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Tried, Tested & Approved

When people's safety is at stake or when property has to be safeguarded it is essential that products offering protection are suitably tested and certified. Selectaglaze submits products to a variety of test houses.

Physical attack

"Secured by Design" *is a crime prevention initiative owned by The Association of Chief Police Officers (ACPO). Products that have been successfully tested, and where possible have third party certification, to Secured by Design requirements are awarded a 'Police Preferred Specification' status.*

Secondary windows are tested against the security requirements of PAS 24:2012 (formerly BS 7950). This simulates forced entry through static loading and manipulation of the window frame, locks and glazing using simple tools. The test does not involve glass breakage and so replicates a stealth attack. Secure glazing that meets standard EN 356 level P1A is required for windows without key operated locks and laminated glass is also recommended for vulnerable locations such as Ground or accessible upper floor windows. Selectaglaze products are tested at The Building Research Establishment.

Standard: LPS1175 *'Requirements and testing procedures for the LPCB approval and listing of intruder resistant building components, strong points, security enclosures and free-standing barriers'*

Developed by the Loss Prevention Certification Board (LPCB), standard LPS1175 deals with elements on the building façade such as doors, windows, shutters and grilles as well as fencing, gates and security enclosures. There are eight levels of resistance measured in terms of the attack tools and the time available to the attacker.

Secondary windows are tested stand-alone without the additional protection offered by the existing window. Both the frame and glass are attacked to replicate a determined assault in which noise doesn't matter. The rigorous tests are carried out at The Building Research Establishment and products are regularly audited to ensure that they continue to comply with the standard. Certified products appear in the Red Book.

Ballistic Attack

Standard: EN 1522 / 1523 *'Windows, doors, shutters and blinds - Bullet resistance –Requirements, Classification and Test method'*

The standard has eight levels of certification covering handguns, rifles and shotguns.

Selectaglaze product is tested by Wiltshire Ballistic Services.

Blast protection

Standard: ISO 16933

'Glass in Buildings – Explosion resistant security glazing – Test and classification for arena air blast loading.'

This standard tests the effects of explosive devices of varying sizes from small packages to a large bomb. Most building elements are tested against 100Kg of explosive charge to replicate a vehicle bomb. The target can be positioned at a number of distances, or stand-offs, starting at 45M (rating EXV45) reducing to 33M, 25M, 19M, 15M, 12M and 10M (rating EXV10).

Tests are carried out through Comblast, a leading commercial blast testing programme held at Spadeadam.

Fire Protection

Standard: BSEN 1363-1, 1364-1

'Fire resistance tests. General requirements / Fire resistance tests for non-load bearing elements. Walls"

A test sample is mounted in a frame to the face of a furnace. The temperature is raised in a controlled manner until all combustible material in the chamber has ignited and the sample then continues to be tested for the specified period of time.

Selectaglaze product is tested by Chiltern International Fire.

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Physical Attack

The choice of secondary window will be dependent on the assessed risks and Selectaglaze products can offer protection at a number of levels.

Low Risk

This guards against an opportunistic attack by a burglar who wants to move quickly and with the minimum chance of detection. Although there are no test standards at this level, a simple secondary window incorporating a lock and toughened or laminated safety glass acts as a deterrent by creating an additional barrier to entry that is both visual and physical.

Medium Risk

This covers a more determined attempt at forced entry but the intruder will generally avoid breaking the glass as the noise will attract attention. Considerable force may be used on the frame and locks which therefore need to be robust. Products with 'Police Preferred Specification' status and accredited to Secured by Design should be specified and glass that performs to EN 356 level P1A is required for vulnerable windows. This is met by 6.8m laminate but a more resistant anti-bandit glass such as 7.5mm, 9.5mm, 11.5mm or 11.3mm provides greater resistance when an intruder resorts to attacking the glass.

High Risk

The building is likely to have a high profile and any attack will be planned and very aggressive. Both the frame and glass will come under determined attack with a range of tools. Products should be specified that are certified to the LPS1175 standard and listed in **The Red Book**. The standard has a number of increasingly challenging test levels. Tools for Level 1 (SR1) include a screwdriver, lever, pliers and knife and the test duration is 10 minutes with an actual attack time of 1 minute. This rises to a 20 minute test time and 5 minutes actual attack time at Level 3 (SR3)with tools such as a claw hammer, small axe, battery drill and a long crowbar. Frames must be very strong with significant locking to opening panels and specialist laminated glass will be required.

These certified products can be used in place of security grilles, gates and bars providing peace of mind without the visual intrusion.

Ballistic Attack

Traditional ballistic protection has been provided by multiple panels of glass laminated together with pvb interlayers. The resultant material is both thick and heavy and needs large supporting frames. Thinner and lighter panes can be produced by laminating layers of glass with polycarbonate sheeting. This allows the design of smaller more easily handled frames making it the preferred material for retrofitted secondary glazing. To ensure continuous protection Selectaglaze ballistic windows consist of demountable fixed panels which are attached by removable fixings to permanently anchored frames. This design allows for planned maintenance.
Protection is offered against the most powerful handguns.

Blast Protection

A significant bomb blast is likely to shatter standard annealed glass more than 100m away and flying shards of glass can lead to many casualties. Whilst the majority of buildings will not be direct targets, the vulnerability of glass at such a large distance demands that building owners or managers give serious consideration to glass containment in the event of a blast.

Low Risk

The building is unlikely to be a direct target but if it has commercial or public use there exists a duty of care and glass should be protected.

Conventional secondary windows glazed with 6.8mm laminated glass will provide an effective barrier against a vehicle bomb detonated 40-45m away. The laminate glass incorporates a thin plastic (pvb) sheet which will stretch under the blast load and hold the glass together. Protection offered by secondary glazing at this level is particularly relevant for small pane windows or lead lights.

Medium Risk

The building is likely to be near sensitive buildings and hence more vulnerable.

Secondary glazing incorporating 6.8mm laminated glass is still very effective but the frames, locks and fixings must be more robust and able to offer protection at a distance of 30-33m from the blast. Frames that achieve 'Police Preferred Specification' status under Secured by Design are suited to this level of protection.

High Risk

The building is a potential direct target on account of its use or ownership and may require a number of protective strategies in addition to enhancement of the glazing.

The laminate glass will have a minimum 1.5mm thick pvb interlayer and 7.5mm, 9.5mm or 11.5mm glass are commonly specified. This thicker pvb stretches further before tearing and can withstand a vehicle bomb detonating 20 -25m away.
The secondary window frames and locks need special features to cope with the blast loads. Glazing rebates will vary between 20mm and 35mm and in some cases the glass will be bonded to the frame. Secure anchors are needed to tie the secondary glazing back to the building structure and in cases where the wall is unable to take the blast loads supporting frames, usually steel, will have to be introduced.

Fire Resistance

Secondary Glazing may be required to windows that need fire resistance on account of proximity to a fire escape or an adjacent building. A fully developed fire achieves temperatures that will melt aluminium so frames must be specially adapted. The inclusion of Pilkington Pyrodur™ glass in conjunction with intumescent seals and fire rated mastics provides half hour integrity protection.
Where one hour protection or insulation is required purpose designed steel sections with appropriate fire rated glass must be specified.

High Security Range

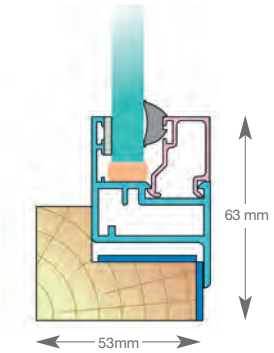
Series 40 - FIXED *(FIRE RATED)*

Application
- Windows adjacent to fire exits

Features
- Intumescent seals
- Rebated softwood subframe
- Pilkington 10mm Pyrodur™ glass
- Fireglaze mastic

Size Guidelines*
Minimum -
Height 700mm, Width 300mm

Maximum -
Height 2800mm, Width 1400mm



CILL DETAIL

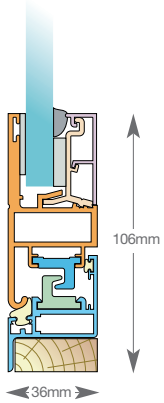
Series 50 - HINGED CASEMENT

Application
- Treatment of single windows requiring ready access

Features
- Anchored bead system
- Bonded glazing
- Flush hinges concealed from attack side
- Multiple locking to 3 sides
- Lockable handle

Size Guidelines*
Minimum -
Height 600mm, Width 500mm

Maximum -
Height 3200mm, Width 1500mm



CILL DETAIL

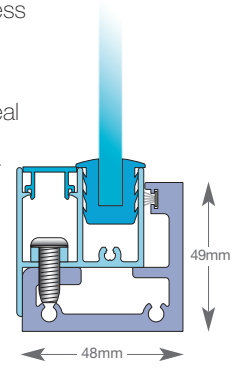
Series 43 - DEMOUNTABLE FIXED

Application
- Treatment of windows requiring access for manintenance only

Features
- Permanently secured subframe, reveal or face fixed
- Demountable glazed panel, single or multiple
- Reduced sight line suitable for heritage buildings

Size Guidelines*
Minimum panel -
300mm x 300mm

Maximum panel -
2200mm x 1200mm



CILL DETAIL

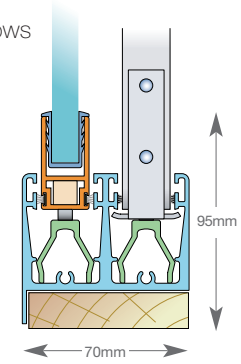
Series 85 - HORIZONTAL SLIDING

Application
- Secure reception windows
- Treatment of casement and ribbon windows

Features
- Anti lift and anti jemmy features
- Central multipoint locking with key lock
- Sashes run on stainless steel ballraces

Size Guidelines*
Minimum -
Height 600mm, Width 1200mm

Maximum -
Height 2600mm, Width 3000mm



CILL DETAIL

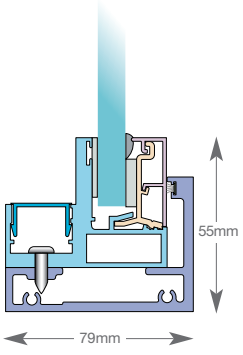
Series 55 - DEMOUNTABLE FIXED

Application
- Secure vision panels for control rooms & laboratories
- Treatment of windows requiring access for maintenance only

Features
- Permanently secured subframe, reveal or face fixed
- Demountable glazed pane, single or multiple
- Anchored bead system
- Bonded glazing

Size Guidelines*
Minimum panel -
400mm x 400mm

Maximum panel -
3000mm x 1500mm



CILL DETAIL

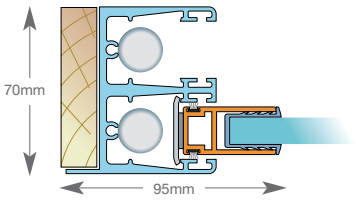
Series 95 - VERTICAL SLIDING

Application
- Treatment of sash windows
- Secure reception windows

Features
- Anti lift and anti jemmy features
- Central multipoint locking
- Sashes supported on heavy duty balances

Size Guidelines*
Minimum - Height 1300mm
Width 700mm

Maximum -Height 3600mm
Width 1600mm



JAMB DETAIL

**Size guidelines show frame capability but actual sizes will be dictated by the specific application, glass composition and handling considerations.*

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Full Product Ratings

Test Standard	Rating	Horizontal Sliding	Vertical Sliding	Hinged	Fixed	Demountable fixed	Product	Glass options *(all dimensions in mm)*
Blast ISO 16933	EXV45	X					S10 2HS	6.8
			X				S20 VSCB	
				X			S45 SHC	
					X		S46 FL	
Blast ISO 16933	EXV33	X					S80 2HS	6.8
			X				S90 VSCB	
				X			S41 SHC	
					X		S40 FL	
					X		S42 FL	
Blast ISO 16933	EXV25	X					S85 2HS	9.5T / 11.5T
			X				S95 VSCB	
				X			S50 SHC	9.5 / 11.5
					X		S50 FL	
					X		S42 FL	9.5T / 11.5T
						X	S43 DFL	
						X	S55 DFL	9.5 / 11.5
Blast ISO 16933	EXV15					X	S55 DFL	15.04
Physical PAS24:2012 (Security Requirement) **'Secured by Design'**	Single rating			X			S45 SHC	6.8
					X		S46 FL	
		X					S80 2HS	6.8 7.5, 9.5, 11.5 11.3
			X				S90 VSCB	
				X			S41 SHC	
				X			S50 SHC	
					X		S40 FL	
					X		S42 FL	
Physical LPS 1175	SR1	X					S85 2HS	12.04
			X				S95 VSCB	
				X			S50 SHC	
					X		S50 FL	
						X	S43 DFL	
						X	S55 DFL	
Physical LPS 1175	SR2	X					S85 2HS	12 Tecdur 12.4 GPG
			X				S95 VSCB	
				X			S50 SHC	
					X		S50 FL	
						X	S43 DFL	
						X	S55 DFL	
Physical LPS 1175	SR3					X	S55 DFL	12 Tecdur
Ballistic EN 1522 EN 1523	FB4					X	S55 DFL	22 GP
Fire BSEN 1363-1 BSEN 1364-1	30 minute integrity				X		S40 FL	10 Pyrodur™

Notes:

1. *Blast ratings against 100Kg TNT equivalent*
   EXV45 – low hazard at 45m EXV33 – low hazard at 33m EXV25 – low hazard at 25m EXV15 – low hazard at 15m
2. *Ballistic FB4 rating provides protection against .357 or .44 Magnum*
3. ***Glass Options** All glass options are laminated.*
   ***'T'** – denotes toughened laminate; **Tecdur** – specialist glass / polycarbonate laminate (glass face to room)*
   ***GPG** – specialist glass / polycarbonate / glass laminate; **GP** – specialist multiple glass / polycarbonate laminate*
   ***Pyrodur™** – Pilkington fire glass*
4. *When using **Tecdur** it is recommended that UV protection film is applied to the external glass*
5. *Refer to Selectaglaze Product Guide for details of all Series*

All tests are conducted on stand alone secondary windows.
The existing primary window will therefore provide some additional protection against blast or physical attack.

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Selectaglaze Limited
Alban Park
Hatfield Road
St. Albans
Hertfordshire AL4 0JJ

Tel: 01727 837271
enquiries@selectaglaze.co.uk
www.selectaglaze.co.uk

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Certificate number 683

A Member of the Glass and Glazing Federation