

Approved Document Q and Rooflights

What You Need To Know



LPS 2081: Issue 1
Cert/LPCB ref: 1347a



1. Introduction

Recent changes to the Building Regulations, with the introduction in October 2015 of Approved Document Q: Security in Dwellings, means that anyone wishing to install rooflights in 'easily accessible areas' will need to ensure they specify a product that is compliant with security requirements.

The changes do not apply to work started before 1st October 2015, to work subject to a building notice, or for planning submitted before that date, provided work commences before 1st October 2016.

In real terms, this means that most roof windows installed in plane, on a typical pitched roof in a two storey building remain unaffected by the guidelines. However glass rooflights designed for flat roof applications are more likely to be affected due to their more accessible locations, often being found on single storey extensions.

2. What is the new Approved Document Q?

To give it its official title *Approved Document Q - Security in Dwellings (2015 Edition)*, is the supporting document to requirement Q1 of Schedule 1 to the Building Regulations 2010; it came into effect on 1st October 2015.



More commonly known as 'Part Q', the document sets out the reasonable standards required for doors and windows to resist physical attack by a casual or opportunist burglar. They must be both sufficiently robust and fitted with appropriate hardware.

Requirement Q1 relating to unauthorised access, states that reasonable provision must be made to resist unauthorised access to any dwelling and any part of a building from which access can be gained to a flat within the building, for example communal areas or hallways.

Where does Part Q apply?

Part Q applies only to new dwellings including those formed by material change of use, so it does not apply in all circumstances. There is a set of criteria in place to guide specifiers on its application. To summarise,

Part Q applies to doors and windows that provide access:

- A. into a dwelling from outside.**
- B. into parts of a building containing flats from outside.**
- C. into a flat from the common parts of the building.**

The document defines doors and windows installed in 'easily accessible areas' as:

- 1. A window or doorway, any part of which is within 2m vertically of an accessible level surface such as ground or basement level, or an access balcony, or**
- 2. A window within 2m vertically of a flat or sloping roof (with a pitch of less than 30 degrees) that is within 3.5m of ground level.**

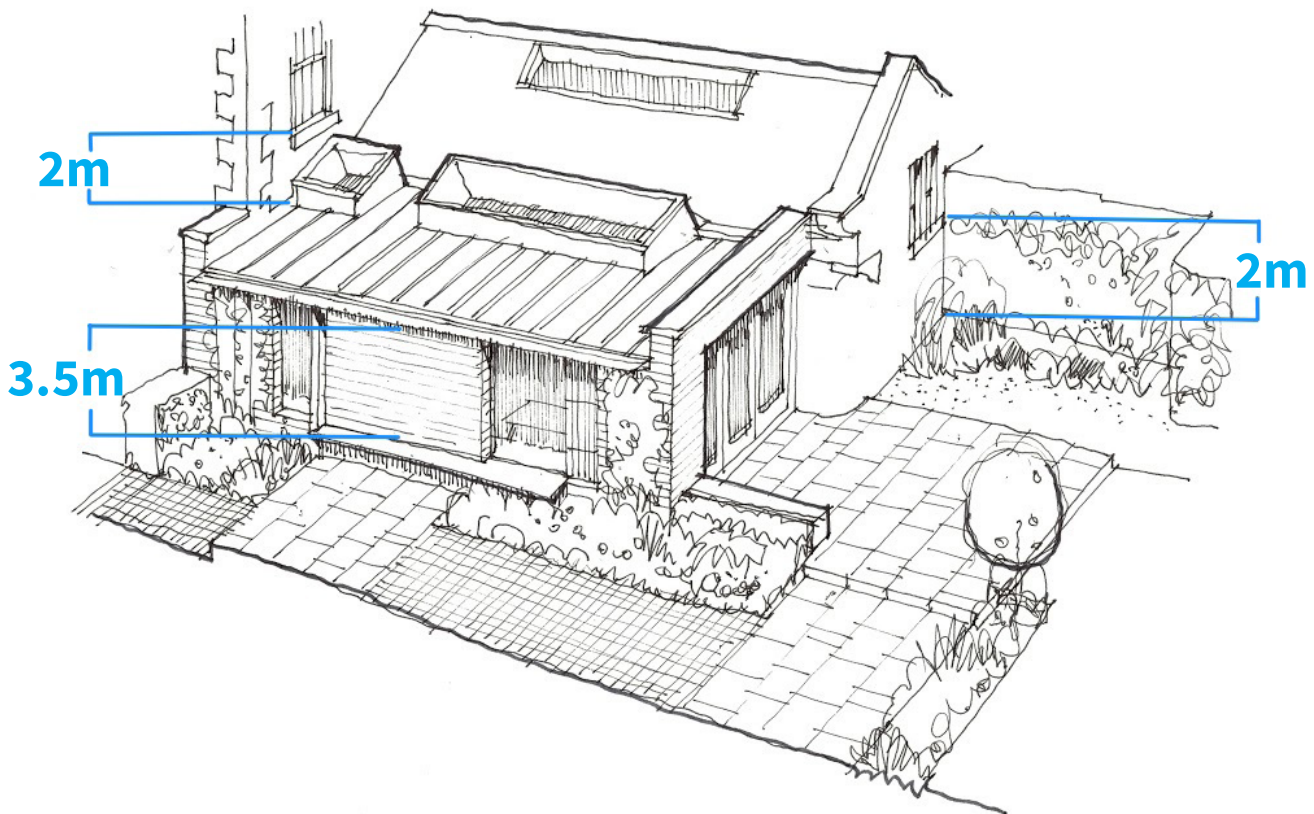


Image courtesy of Chiles Evans + Care Architects (CE+CA)

How does this apply to rooflights?

The introduction of Approved Document Q is the first example where rooflights have been specifically referred to in the context of security; prior to this any regulation in place was designed around door sets and windows.

Specifiers should be aware of this change and ensure that any rooflight products falling within the criteria set out above are compliant with Building Regulations.

Current trends in building design, demanding open plan living with light, airy spaces has meant that the installation of glass rooflights in flat roof applications is increasingly common both in new dwellings and also where home owners are extending their properties.

These trends have seen a significant growth in single storey extensions featuring products that are more likely to fall within the criteria set out in Part Q than roof windows. Projects should be assessed on a case by case basis and although less likely, there are still circumstances where a roof window will fall within the requirement.

Who is responsible for ensuring products are compliant?

Although it would prevent their use in easily accessible locations, there is no requirement for manufacturers to test their products to the standards set out in Part Q.

However specifiers must ensure that where applicable, the products selected will comply with Building Regulations by checking that the product has been tested and certificated to an acceptable standard set out in Approved Document Q.

The installation of glass rooflights in flat roof applications is increasingly common in new dwellings and extensions.



3. What are the test standards for 'secure windows'?

To satisfy the requirements of Part Q, windows should be made to a design that has been shown by test to meet one of the following standards:

- › [PAS 24:2012](#)
- › [STS 202 Issue 3:2011](#)
- › [LPS 1175 Issue 7:2010 security rating 1](#)
- › [LPS 2081 Issue 1:2015 security rating A](#)

Secured by Design's New Homes 2014 offers further advice and includes STS 204 Issue 3:2011 burglary rating 1.

PAS 24:2012 is the preferred reference point for Part Q, but windows satisfying the other standards, which provide similar or better performance, are also acceptable.

Most of these standards were originally intended to test the security of vertically installed windows and doorsets though, and some are not suitable for testing rooflights, especially rooflights in flat roof applications.

PAS 24:2012

PAS 24:2012 is a Publicly Available Specification, published by the British Standards Institute, that stipulates the enhanced security performance requirements for doorsets and windows in the UK.

It supersedes PAS 24:2007+A2:2011 and BS 7950:1997.

PAS 24 covers external doorsets and windows that are intended to offer a level of security suitable for dwellings and other buildings exposed to similar levels of risk. It specifies test methods and acceptance criteria for doorsets and windows intended to resist the attack methods of a casual or opportunistic burglar.

PAS 24 has been updated as of 29th February 2016, and the changes allow a wider range of security doorsets and windows to be covered in the standard. This enables more products to use the Building Regulations Approved Document Q1 to demonstrate compliance. A number of test methods have been simplified and PAS 24:2016 will be incorporated into Part Q in due course.

Products submitted for test are required to be supported and installed vertically, so this standard is not suited to testing glass rooflights, particularly for flat roof applications.



STS 204 Issue 3:2012

STS Security Technical Specifications are published under the 'Certisecure' brand by Warrington Certification Ltd.

STS 204 Issue 3 defines the requirements for windows tested in accordance with PAS 24:2012 and BS 6375.

BS 6375 is the British Standard that covers the performance of windows and doors; it is split into parts 1, 2 and 3, which cover weather tightness, operation and strength characteristics and additional performance characteristics respectively. In addition to this, STS 204 covers general guidance on selection and specification.

STS 204 therefore covers both the security requirements outlined in PAS 24, as well as the more general characteristics in BS 6375. This means that it covers broader, more comprehensive performance requirements.

However, as with PAS 24, there is no specific reference to rooflights or skylights, so this test is not really applicable to glass rooflights for flat roof applications.

[View the full document here.](#)

LPS 1175 Issue 7:2010 security rating 1

LPS Loss Prevention Standards are issued by the Loss Prevention Certification Board, an independent third-party service provided by the Building Research Establishment (BRE) that focuses on fire and security issues.

LPS 1175 sets out the requirements and testing procedures that are needed for a product to gain LPCB approval and to be listed in the LPS recommendations, along with other intruder-resistant building components, strongpoints, security enclosures and free-standing barriers. The standard covers many types of building component, not just windows.

The intruder resistance of the product itself is tested in addition to any in-situ hardware such as locks and hinges, but individual components such as glass, infill materials or locks are not classified in their own right.

Security rating 1 - the lowest requirement according to the test methods outlined in LPS 1175 - is satisfactory for compliance with Building Regulations Part Q. Ratings 1 and 2 are loosely based on domestic risks, while ratings, 3 and 4 relate to commercial risks, and 5 to 8 are for high security situations.

[View the full document here.](#)

LPS 2081 Issue 1:2015 security rating A

LPS 2081 covers a similar group of building components, tests and requirements to LPS 1175, but specifically addresses offering [resistance to opportunist intruders attempting 'stealth' attacks to gain entry](#), which are often carried out in residential areas.

Stealth is where the burglar wants to avoid making significant noise, and would avoid being seen through natural surveillance. The products are tested against the use of bodily force and for tools that can be easily concealed about the body. The tools used in the test are split into two categories.

This makes it more suitable for testing rooflights that are commonly found in domestic and residential applications, where an offender will go to greater lengths to avoid drawing attention to themselves.

Security rating A is the only required test for the Building Regulations Part Q. The product is tested for a maximum of 1 minute using tool category 'a' - including cable cutters, glass cutters, knives, pliers and small screwdrivers.

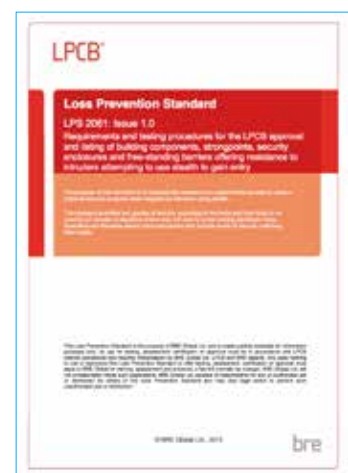
Security rating B (not required for Part Q) is more difficult to achieve and is awarded to products that withstand an attack of 3 minutes with tool category 'b' - bolt cutters, claw hammers, hacksaws and larger screwdrivers.

If the product needs to resist a more sophisticated tool set or withstand an attack for significantly longer than 3 minutes, then it should be tested to LPS1175, which covers categories including commercial and high security risks.

LPS 2081 specifically addresses offering resistance to opportunist intruders attempting 'stealth' attacks to gain entry



'Testing fixed Flushglaze rooflights in line with part Q building regulations'



[View the full document here.](#)

STS 202 Issue 3:2011

As detailed in Secured by Design New Homes 2014, STS 202 covers requirements for the resistance to burglary of various construction products, including hinged pivoted, folding or sliding doorsets, windows, curtain walling, security grilles, garage doors and shutters. Although it does not specifically refer to rooflights or roof windows, there is no specific requirement to test vertically, so it can be used for testing rooflights.

The tests are carried out to one of six resistance classes, which equate to different lengths of attack and types of tools.

BR1 and BR2 resistance equate to the level of attack normally

associated with casual or opportunist burglars, using common hand tools that do not make significant noise; they are loosely based on low-risk domestic properties.

BR3 and BR4 simulate attacks associated with more practiced burglars who are prepared to make noise and take risks, and are based on medium-risk commercial properties.

BR5 and BR6 covers the types of attack made by professional type burglars, who will use power tools with no regard to noise levels and are likely to have knowledge of the construction products that need to be overcome; they are designed to address high-risk, high security properties.

- BR1 and BR2 resistance equate to the level of attack normally associated with casual or opportunist burglars

- BR3 and BR4 simulate attacks associated with more practiced burglars.

4. What is Secured by Design?

Secured by Design (SBD) was established in 1989 and is the official UK Police security initiative owned by the Mayor's Office for Policing and Crime (MOPAC).

It's aim is to reduce crime by combining the **principals of 'designing out crime' through physical security** and layout across all realms of the built environment. The scheme also calls for the installation of security products that meet police approved standards.

SBD works with industry test houses to create and test high level security standards in response to trends in crime. Where a manufacturer has successfully tested its product and been certified by an accredited testing body to the specified standards, it can apply for [Secured by Design membership](#) and licence to utilise the scheme's logo, making it easier for specifier's to identify products that are tested and approved.

Although a product may in principle be secure and good enough to pass these standards, unless it has been tested and certificated it cannot use the Secured by Design mark and will not be supported by the Police.

Secured by Design member company status is awarded to companies producing security products that pass standards and tests nominated by the police service. The standards and related tests must demonstrate the product's effectiveness in preventing or reducing crime, usually by resistance to physical attack.



Secured by Design New Homes 2014

[Secured by Design's New Homes 2014 Document](#) offers further guidance; it aims to promote best practice solutions to 'design out crime' in new residential developments and homes.

Its recommendations are wide-ranging and the high level guidance includes the layout of communal spaces, use of lighting, access and landscaping, and highlights planning decisions that reduce the risk of crime and anti-social behaviour.

Particular attention is paid to doorsets and windows, along with more specific guidance on other building components and security measures.

Section 29 of the document offers a page of guidance specifically about rooflights, with the PAS, STS and LPS standards mentioned above being referenced as necessary certification.

The term 'easily accessible', which is defined in Part Q with some specific measurements and dimensions, is explained a bit more generally here:

"Common sense dictates that easily accessible windows or doorsets are those that can be accessed via a flat roof, balcony or other similar structure e.g. external supporting or decorative balcony detail.

'Easily Accessible', in this context also means that access can be gained by two persons (one climbing, one assisting) without the use of a climbing aid, such as a ladder."

New Homes 2014 notes that laminated glass meeting the requirements of BS EN 356:2000 class P1A should be used in easily accessible rooflights, this type of glass specification is designed to physically hold fractured glass panes together in the event of a breakage so is ideally suited to slow penetration times if forcibly attacked.



Why specify a Secured by Design product?

The Secured by Design logo is the only symbol that guarantees national police approval of a product, providing architects, planners, specifiers, builders and end users with reassurance that it provides a realistic level of resistance to criminal attack. It is widely recognised within the building industry and is increasingly being listed as a mandatory requirement in tenders.

For developers, Secured by Design accredited products can help to demonstrate an effort to reduce crime. Planners recognise the effectiveness of the products and design strategies recommended by Secured by Design; therefore creating a development that is SBD compliant and / or utilises SBD-accredited building and security products is an easy way to ensure compliance with new guidelines.

It is up to the specifier to ensure that a product complies with Building Regulations of course, but SBD provides an easy route to identify which of the many published technical standards indicates a product is an effective crime prevention measure.

This scheme is set up to make it easy for clients to recognise individual products prior to purchase and offer peace of mind that those products have been tested to a national standard that is recognised by Building Control.

For a manufacturer, gaining Secured by Design approval is a significant achievement. It demonstrates a commitment to put their product to the test in order to maximise the safety and security of their customers as well as proving to customers that the product matches performance claims.

What does it take to pass these tests?

We have covered what standards are applicable under Approved Document Q and detailed which of these can be applied to glass rooflights. LPS2081 is the latest of these standards and one of the most relevant for domestic applications due to its focus on stealth attack, but how is this test actually administered and how much abuse do the rooflights really have to take?

In this section, we cover in further detail a specific set of tests carried out on both fixed and opening glass rooflights designed for flat roof applications. Several samples were installed according to manufacturers standard recommendations so as to mimic an actual rooflight installed on site.

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5. Security of glass in rooflights

To achieve security rating A to LPS 2081 Issue 1:2015 the product must withstand a sustained attack on glass, framework and mechanical fixings using hand tools for up to one minute.

The glass can break, but should remain sufficiently intact to prevent an intruder gaining entry into the building. To demonstrate this under controlled conditions an elliptical test block is used to determine whether or not an intruder could pass through any broken barrier.

Glass is the obvious weak point in this type of product so specification is critical; toughened safety glass will break fairly easily using simple tools so in order to withstand an attack for any significant length of time, a laminated

inner pane will be specified. In order to reduce the risk of fracture due to thermal heat stress it will most likely be heat strengthened laminate rather than annealed laminate.

As mentioned previously, although Security Rating A is the only required test for the Building Regulations Part Q, a further test using an enhanced set of tools can prolong the attack for up to three minutes; this is then awarded a *Security Rating B*.



Rooflight on flat roof extension



Examples of toolsets used in LPS 2081 test

Security of rooflight frames

LPS 2081 tests are not only focused on the glass itself but also the frame and the way that the glass is fixed into it. Depending on the material and construction technique, the rooflight frame itself can sometimes be vulnerable to attack.

In this specific test the glass is structurally bonded into an aluminium frame on all sides, which provides improved structural integrity and is able to withstand the test attacks in LPS 2081. A frame like this can be attacked with a number of different tools without failure.

The last resort is to remove the mechanical fixings to the upstand and lever them out with a crowbar or claw hammer. Although it is not impossible to remove a high security rooflight to gain forced entry, if the process takes over three minutes the test stipulates that by this time, most attempts will be abandoned due to the risk of alarms being raised or being discovered.

An LPS 2081 tested frame can be attacked with a number of different tools without failure.

Security of larger modular rooflights

In some cases, glass rooflights will be specified and manufactured in modular sections to allow for larger expanses of glass and will include some kind of structural joint between the glazed panels.

It is important that these joints do not present a weak point in the structure; where available any supporting material and framework systems will also be attacked so that all configurations or variations of the product are considered.

One of the most robust methods is the use of back-to-back angles: two 90-degree right angles arranged in a t-section (pictured right).

These angles are welded to the perimeter frame and are strong enough to prevent the intruder gaining entry for up to three minutes, meaning the product can be awarded security rating B to LPS 2081.



Security of opening rooflights

Opening rooflights are sometimes considered less secure than fixed rooflights because of their potential to be forced open, but this will depend on how the opening section is secured.

Many opening rooflights do not have the same level of locking system when compared to doors and windows, because in most cases they are not as easily accessible.

But with the increase in single-storey home extensions and in turn more easily accessible rooflights, the security of an opening rooflight should be carefully considered.

Locking points can often be the weak link in design; LPS 2081 tests can be performed on hinged, mechanically opening rooflights, where they are subjected to attacks on the opening mechanisms, locking devices and hinges.

To prevent opening sections being forcibly pried open, it is often better to look for products with dual locking systems at either end, which will make any attempt to open the rooflight much more difficult. Electrically operated and motorized systems should not be possible to be 'back driven'.



Part Q security testing process on Visionvent opening glass rooflight.

Consideration should also be given to the location of any interior control switch; if this is possible to access through broken glass it could represent further opportunities to open the rooflight and gain entry. Systems operated by control switches installed at ground level where you might install a traditional light switch will be most successful as they will remain out of arms reach even if the glass fails.

The hinges fixing the opening section to the base frame are another potential weak point with opening rooflights. Any externally visible fixings are open to attack and could be forcibly removed.

To repel intruders alternative design methods such as continuous hinges can be used; these are formed as part of the extrusion itself, allowing the lid and the base frame to be slotted together as a pair without the requirement of additional hardware. The hinges run along the entire width of the product and are not externally visible. Under testing these have proven to be impossible to force open within the time frame allowed.

In summary, all aspects of rooflight design, material and method of installation are interrogated and any weak points will be taken advantage of in order to breach, destroy or forcibly remove or open the rooflight. Given enough time and an aggressive enough toolset, these products will ultimately be defeated, but providing they are successfully tested to an applicable standard they can be safely installed in the environment for which they were designed.

Many opening rooflights do not have the same level of locking system when compared to doors & windows

GLAZINGVISION

securesecure+

stronger than you'd think



Glazing Vision offers two ranges of rooflights - **Secure and Secure+** - which have been tested to LPS 2081:1 2015. The range is **accredited by the LPCB** and they are the first rooflights in the UK to be backed by the official police security initiative, Secured by Design.

'Secure' rooflights have been tested to LPS 2081 security rating A which identifies them as being able to withstand a sustained attack for up to one minute.

'Secure+' rooflights have passed the more stringent LPS 2081 security rating B test, and are able to withstand an attack of up to three minutes.

Products tested so far include Glazing Vision's **fixed Flushglaze rooflight range** including its solo, modular, walk-on specification and wall-abutted variants. Glazing Vision's rooflights are available in both security levels - Secure and Secure+.

Visionvent, Glazing Vision's flagship hinged ventilation rooflight, has also been successfully tested to LPS2081 security rating B.

Both the Secure and Secure+ ranges are fully compliant with Approved Document Q and will be supplied with upgraded laminated glass as standard.



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