



# SPECIFICATION PRODUCT GUIDE

ISSUE 10



## WINDOW STYLES

# Welcome

Wrekin Windows has specialised in supplying PVC-U windows and doors to the social housing sector since 1985. This has given us a clear understanding of the sector and a reputation for delivering high quality, low maintenance PVC-U windows and doors that are energy efficient.

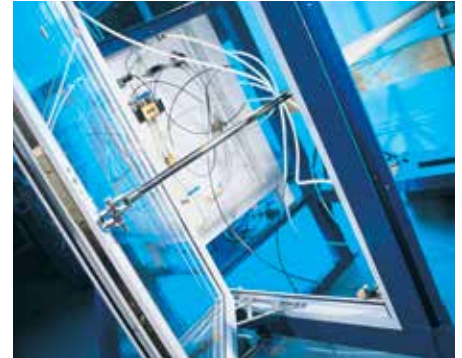
We offer the social housing sector an unrivalled range of windows and doors fabricated using Profile 22, one of the UK's leading systems. Ongoing product development focuses on safety, security, energy efficiency and special needs, and all our products are rigorously tested in-house and externally by accredited independent agencies.

We operate from technologically advanced manufacturing facilities conveniently located near the M54 and M6 motorways and have produced over a million windows for social and affordable housing properties.

- We provide outstanding value through competitive pricing, quality products and services.
- Production and delivery is geared to meeting clients' programme needs, with 'first time' complete property installation.
- Comprehensive 10 year guarantee, including approved hardware.
- Part of the Epwin Group, whose main activities are the extrusion of PVC-U and roofline products, and the manufacture of windows, doors, conservatories and sealed units.
- Nationwide coverage



## Quality Assured



Wrekin Windows holds a comprehensive range of accreditations to ensure that we meet the most stringent project requirements.

- Our windows are produced to BS7412.
- PAS24 compliant options are available to meet the requirements for enhanced security performance.
- We adhere to the BPF code of practice for the survey and installation of plastic windows and doorsets.

## Accreditations



CHAS is the contractors' health and safety assessment scheme designed to ensure safe working on site. It ensures that all members adhere to the strict criteria laid down before commencing any contract.



SECURED BY DESIGN is the initiative launched by the police to ensure high standards of crime prevention measures.



EXOR provides an efficient, outsourced supply chain to central/local government, housing associations, private and public sector organisations.



BBA is the UK's major authority offering approval of construction products, systems and installers.



ISO 9001 ensures consistency and improvement of all our working procedures to ensure our products and services are class leading.



CONSTRUCTIONLINE is the largest online database for pre-qualified contractors and consultants.



ISO 14001 ensures continuous improvement and operation of our environmental management system.



FENSA allows companies to self-certify that their installations comply with current building regulations.



Our windows are CE marked.

## Casement Windows

Wrekin Windows offers a range of integrated open-out windows in a variety of single or multilight styles, using top hung vents, side hung casements and fixed lights, either internally or externally glazed, in white, woodgrain on white or woodgrain finish, fabricated to BS 7412. Round head, circular or lancet windows may be supplied depending on size, style and application. These are available in Fully Chamfered 60mm frames and sashes, Fully Sculptured 70mm frames and sashes and Fully Integrated 70mm frames incorporating 60mm sashes.



### Profile

Acrylic modified high quality impact resistant white PVC-U extrusion, producing a rigid multi-chambered profile to BS EN 12608 manufactured to BS EN ISO 9001.

### Reinforcement

Specific members are reinforced with galvanised mild steel or RCM sections to BS 7412 sealed within the profile central cavity.

### Glazing

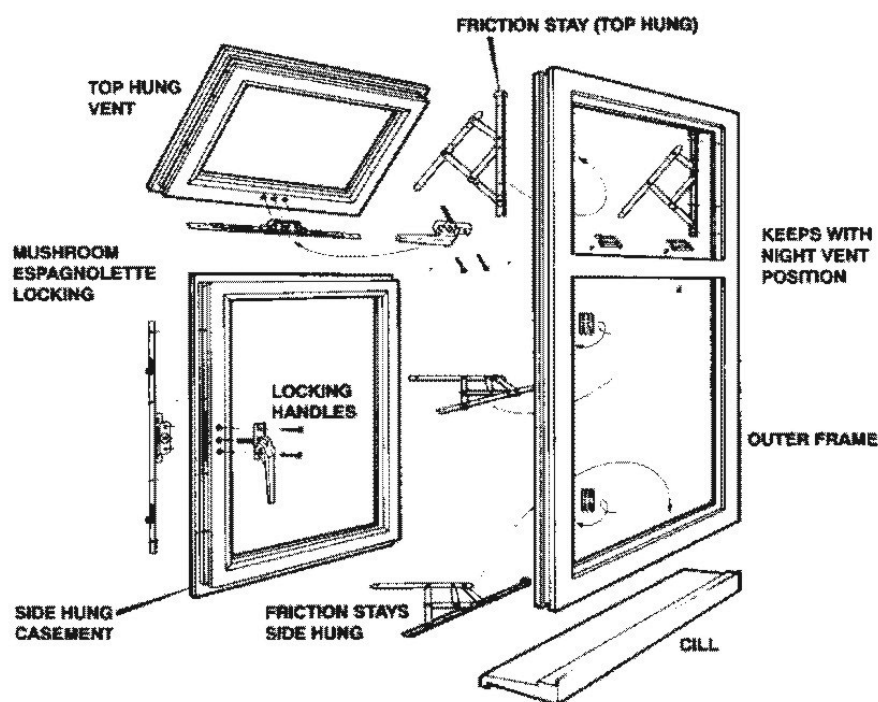
Glazing can be supplied as either double-glazed (24mm & 28mm) or triple-glazed (36mm) finished glass units depending on thermal or acoustic requirements.

### Performance

Double Bubblex weatherseals ensure the performance meets the requirements of BS 6375 Part 1, as shown below. Actual performance will depend on size and style.

TEST	EXPOSURE CATEGORY				
	800Pa	1200Pa	1600Pa	2000Pa	2000+Pa
AIR PERMEABILITY	300Pa.	300Pa.	300Pa.	300Pa.	300Pa.
WEATHER TIGHTNESS	100Pa.	100Pa.	200Pa.	200Pa.	300Pa.
WIND RESISTANCE	800Pa.	1200Pa.	1600Pa.	2000Pa.	2000+Pa

## Casement Windows continued



Run Up Block



Security Clip  
(External glazing only)



Dedicated Keeps



Hinge Protector



Shootbolt Extension



Chrome Handle

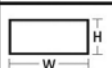
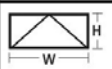



Defender Hinge



Rail Espags

Minimum & Maximum Sizes (Subject to Sealed Unit weight)

	STYLE	LOCKING	MIN. SASH SIZE		MAX. SASH SIZE	
			WIDTH	HEIGHT	WIDTH	HEIGHT
FIXED LIGHT		N/A	340	340	202m <sup>2</sup>	202m <sup>2</sup>
TOP HUNG		SHOOTBOLT ESPAG	290 335	290 316	1235 1235	1235 1235
SIDE HUNG		SHOOTBOLT ESPAG	376 431	290 335	735 735	1335 1335

### Hardware

Vents and casements are hinged using stainless steel friction hinges, or the option of butt hinges with security pin. Locking or non-locking handles are available in a variety of finishes.

All hardware meets the requirements of BS 7412. When fitted with high security hardware, windows meet the requirements of PAS24.

### Locking

The windows are fitted with mushroom-headed espagnolettes or shootbolts for added security, both options with night vent facility.

### Ventilation

In addition to the night vent, controllable or permanent ventilators are offered as an optional extra, fitted within the head profile of the window.

## Tilt and Turn Windows

These all-around locking, internally glazed, open-in, 60-70mm depth windows provide good security and weather tightness. The tilt before turn operation provides improved child safety and the ability to carry out internal and external cleaning without risk - a vital consideration in high-rise applications. In the tilt mode the window offers secure ventilation, an important factor in ground floor installations.

The option of curved or angled head and top rails, to suit design requirements, is an additional feature.

Available in Fully Chamfered 60mm frames and sashes, Fully Sculptured 70mm frames and sashes and Fully Integrated 70mm frames incorporating 60mm sashes.



### Glazing

Glazing can be supplied as either double-glazed (24mm & 28mm) or triple-glazed (36mm) finished glass units depending on thermal or acoustic requirements.

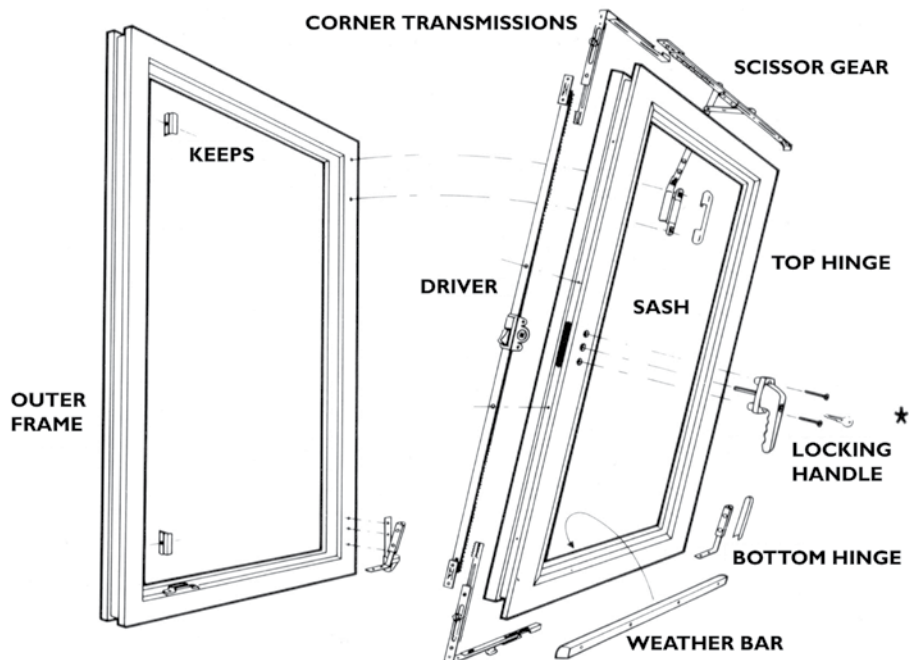
### Performance

Double Bubblex weatherseals ensure the performance meets the requirements of BS 6375 Part 1, as shown below.

Actual performance will depend on size and style.

TEST	EXPOSURE CATEGORY				
	800Pa	1200Pa	1600Pa	2000Pa	2000+Pa
AIR PERMEABILITY	300Pa.	300Pa.	300Pa.	300Pa.	300Pa.
WEATHER TIGHTNESS	100Pa.	100Pa.	200Pa.	200Pa.	300Pa.
WIND RESISTANCE	800Pa.	1200Pa.	1600Pa.	2000Pa.	2000+Pa

## Tilt and Turn Windows continued



Mushroom Striker



TBT Scissor Stay



TBT Bottom Hinge



Security Restrictor



Night Vent



Handle




Slot Vent



VSU

\*Consideration for fire egress must be sought when choosing the type of handle required. Particularly on levels above ground floor.

### Minimum & Maximum Sizes

	STYLE	LOCKING	MIN	DIM	MAX
TBT		TBT GEAR	413	W	1613
			603	H	2333

### Hardware

The Tilt before Turn safety feature ensures the 'Tilt' or ventilation option occurs first, followed by the 'Turn' or cleaning option. The mechanism comprises bichromate finished steel multi-point espagnolette locking, operating around the sash. The number of locking points is dependent upon the window size.

An anti-switch barrier is fitted to prevent selection from tilt to turn, while in the tilt mode and vice versa. The window must be closed before the alternative mode may be selected. A locking handle may be fitted for added security at ground floor level.

### Ventilation

In addition to the tilt mode, controllable or permanent ventilators are offered as an optional extra, fitted within the head profile of the window.



## Fully Reversible Windows

Especially designed for medium-high rise applications and inaccessible locations, our Fully Reversible Window has been manufactured using low carbon technology and pioneers our 'thermal barrier' technology.

These 70mm Fully Reversible Windows have their own unique appearance designed with a deep-bevelled edge to the window profile giving it a striking, but modern look. The window easily rotates 180° allowing for safe and easy cleaning of the outside pane without the window entering the room space itself; avoiding snagging of curtains or blinds. Its high security locking and child resistant safety catches, and weather performance ensures its maximum safety and security.



1) The window can rest in the narrow night ventilation position or with approximately 100mm opening



2) The window can also rest in a more open position approximately 300mm opening



3) Once the safety catch is released the window can be completely rotated



4) The window rotates without entering the room space



5) The special hinge assembly brings the outside of the window to the inside of the room



6) The fully reversed window engages on a safety catch and allows safe and easy cleaning of the outside pane

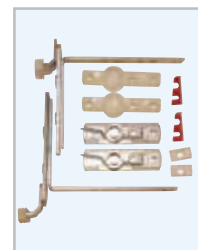
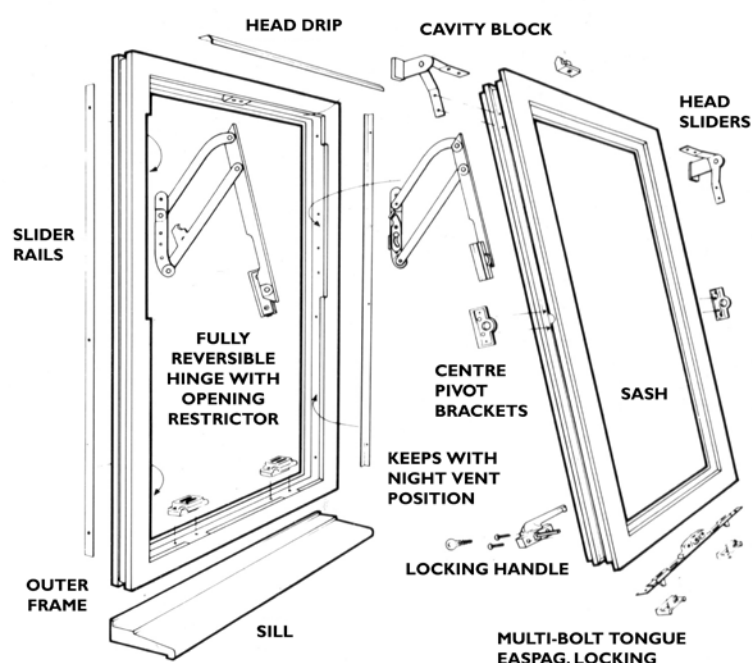
### Performance

The highly innovative 'Aeroframe' has been integrated into this new window system allowing for greater thermal performance through its complex 'thermal barrier' technology. This Fully Reversible Window is a 5 chamber system and achieves a WER 'A+' rating when glazed with argon filled triple glazing. The system eliminates the need for expensive Krypton gas filled units, insulation in the profiles or expensive special reinforcing; therefore reducing cost.

TEST	VALUE
AIR PERMEABILITY	600Pa.
WEATHER TIGHTNESS	300Pa.
WIND RESISTANCE	2400Pa



## Fully Reversible Windows continued



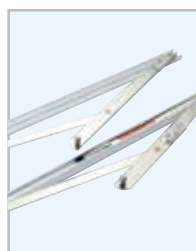
Fully Reversible Accessory Kit



Mushroom Keep



Fully Reversible Gearing



Yale Fully Reversible Hinges




Rail Espagnolette



Handle Options

### Minimum & Maximum Sizes

	STYLE	LOCKING	MIN	DIM	MAX
FULLY REV		ESPAG	502 388	W H	1602 1488

### Reinforcement

Specific members are reinforced with galvanised mild steel or recycled composite material reinforcement to BS 7412 sealed within the profile central cavity.

### Hardware - Locking

Security features multi-point mushroom espagnolette, with night vent facility and lockable handles (dependent upon fire egress requirements)

### Ventilation

Controllable or permanent ventilators can be fitted into the head of the frame.

## Residential Doors

Residential doors with an outer frame depth of 60-70mm may be produced in a variety of styles and are available as single or double units. Offered as internally glazed as standard, either open-in or open-out, with the option of standard frame sill or medium/low threshold, suitable for wheeled traffic. Composite PVC-U smooth skin or feature infill panels can be supplied in white or woodgrain, with either standard or steel reinforced treated core. Welded or mechanically jointed midrails may be fitted if required. The option of curved or angled head and top rails, to suit design requirements, is an additional feature. Matching sidescreens are also available.

### Profile

Acrylic modified high quality impact resistant white PVC-U extrusion, producing a rigid multi-chambered profile, conforming to the requirements of BS EN 12608, manufactured to BS EN ISO 9001.

### Reinforcement

Leaf styles and top and bottom rails, together with outer frame jambs, are reinforced for strength and security with galvanised mild steel to BS 7412, sealed within the profile central cavity. Outer frames can alternatively be reinforced with RCM.

### Secured by Design

Secured by Design is a scheme run by the Police to help homeowners choose security products that meet rigorous Police-approved standards. When you see the Secured by Design hallmark you know you are choosing products that have been rigorously tested and approved by the Police. To achieve accreditation, the lock must withstand a series of tests, including a simulated break-in.

### Glazing

Double-glazing to BS 6262 can be supplied, using 4mm or 6mm safety glass, depending on thermal or acoustic requirements. Double glazed units conform to BS EN 1279. Glazing options include patterned glass; Georgian bars and leading, all internally glazed with post co-extruded beads.

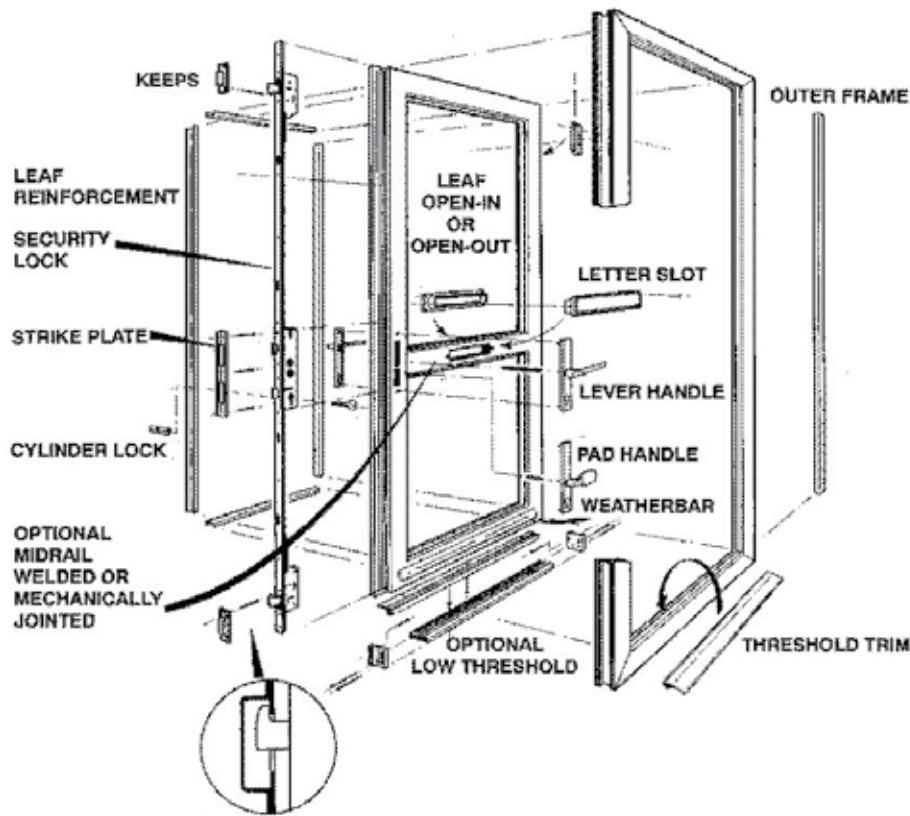
### Performance

Double Bubblex weather seals ensure the performance meets the requirements of BS 6375 Part 1, as shown below. A weather bar is fitted on all open-in doors. Actual performance will depend on size, style and threshold type.



TEST	EXPOSURE CATEGORY				
	800Pa	1200Pa	1600Pa	2000Pa	2000+Pa
AIR PERMEABILITY	300Pa.	300Pa.	300Pa.	300Pa.	300Pa.
WEATHER TIGHTNESS	100Pa.	100Pa.	200Pa.	200Pa.	300Pa.
WIND RESISTANCE	800Pa.	1200Pa.	1600Pa.	2000Pa.	2000+Pa

## Residential Doors continued



### Hardware

Handle furniture is available in a variety of finishes, as lever/lever or lever/pad, depending on application. Butt hinges with security pin, or the option of fully adjustable hinges, are supplied. Letter plates are fitted in midrails where required. Additional hardware, e.g. security devices, hold open arms etc., are offered as optional extras. All hardware meets the requirements of BS 7412.

**Threshold trim:** It is recommended that on doors with PVC-U frame thresholds, the threshold trim is fitted as standard.

### Locking

The doors are fitted with secure multi-point hook bolt locks that have undergone type approval testing to PAS24. In double doors the slave leaf can be secured by means of finger bolts or shoot bolts activated by lever handles to provide a locking frame for the master leaf.



Letter Plate



Lever/Lever Handle



One Piece Keep



Centre Hook Thrown



Safeware 7 Master Lock



Yale Cylinder



2D Adj. Butt Hinge



4 Roller Lock



Safeware 8 High-Security  
Tandem Bolt



Safeware 8+ Optional  
Shootbolt

## Emergency Exit Doors



Selected doors can be supplied with panic bars for emergency or fire exits. Single doors. Single doors use either multi roller or head and threshold shootbolts, double doors use shootbolt mechanisms and all doors are fitted with midrails and are bar operated. Standard or low thresholds can be supplied to suit specific requirements. Combination units are also available with a single door for normal access and an adjacent single panic bar door for emergency.

All doors conform to our residential door specification.

Additionally, panic bar mechanisms meet the requirements of BS EN 1125 as specified and approved by fire officers and local authorities.



## Patio Doors



Wrekin Windows offers a range of high quality and secure PVC-U in-line sliding patio doors in a selection of different pane and finish options. The multi-chambered sash and outer frame profiles construction offers improved durability and thermal insulation.

- Slim stepped 86mm outer frame for minimal plaster cutback
- Multi chambered profile for greater thermal insulation
- Lowline gaskets extruded to sash frame for greater visible glass area
- 2/3/4 pane
- Anti-jacking system 6 point lock
- 3 woodgrain finishes plus, woodgrain on white
- Stainless steel easy glide track system.
- Concealed drainage and double wool piling for improved draft proofing
- Secure by Design option

## Useful Information

### PROFILE

#### Maximum and Minimum Sizes

If windows/doors are required to be fabricated outside of these limits shown in the charts on the previous pages, please consult the Technical Department.

#### Composite Windows

- Any opening or fixed light in a frame must conform to the sizes stated in the charts on the previous pages.
- On crucifix frames with mullions and transoms that span the total width and height, the smallest dimension (width or height) must be reinforced continuously to achieve optimum performance.

#### BS Kitemark Compliance

The manufacture of a product within the maximum overall sizes stated, and reinforced where required with the recommended steels, does not signify that the product automatically complies with BS Kitemark provisions.

To conform to BS Kitemark requirements the following criteria must be met:

- The manufacturing company must be approved to BS EN ISO 9001 or, alternatively, operate a system which conforms to those standards.
- The product must be fitted with a sealed unit manufactured to BS 5713 (BS EN 1279 PT 2)
- The quality of hardware, weatherseals and gaskets fitted must conform to approved levels, using parts as recommended by us.
- The product must not exceed the maximum overall sizes for stated profiles.
- Where required, the profiles must be reinforced with the recommended steels.

If in any doubt regarding conformity with BS Kitemark requirements, please contact the Technical Department for advice.

The above information is provided for general guidance only and may be subject to change without notice.

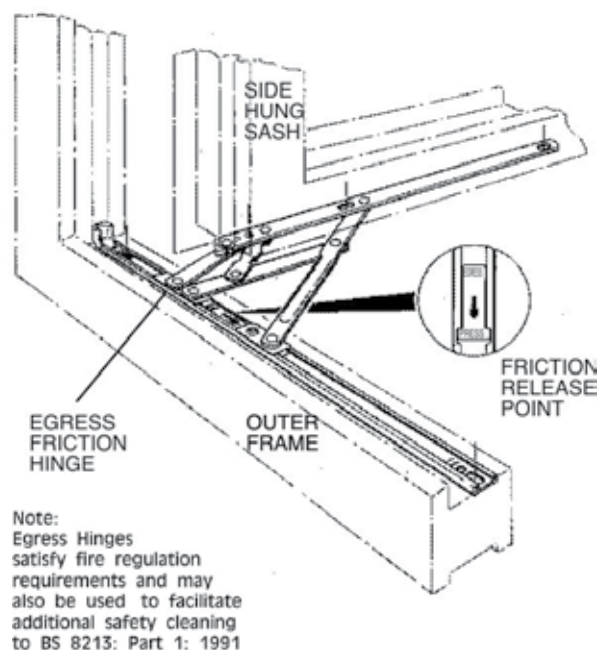
### HARDWARE

To maintain the quality of our window/door systems, hardware must be good quality and designed to suit the particular system. Wrekin Windows works closely with hardware suppliers, in some cases agreeing unique changes to ensure the window/door provides maximum security, weathering and reliability.

#### Windows

On Casement Windows, suitably maintained friction stays fulfil the function of hinging the sash, but also serve to:

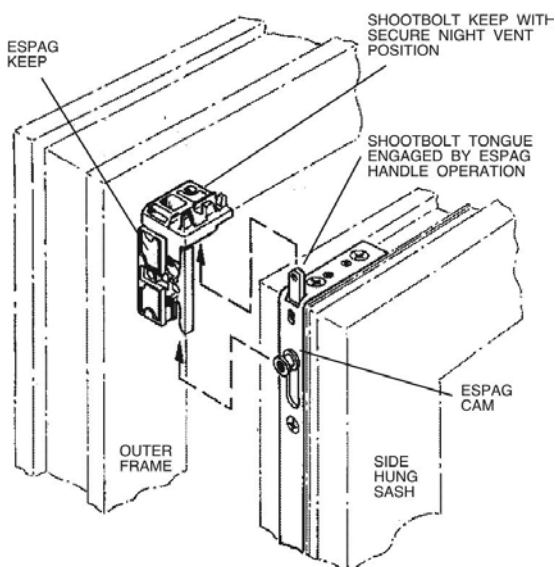
- Provide effective closing/sealing of the sash to frame at the corners.
- Offer constant opening/closing friction during the lifetime of the window.
- Effectively support the sash weight during opening/closing – particularly important on side-hung applications.
- Provide an essential element in achieving the requirements of BS 7950.
- Allow for egress in case of fire, providing additional modifications can be incorporated. Moreover, whilst the standard hinge allows cleaning from the inside, additional release mechanisms can be included to allow greater access on side-hung windows. (See diagram).



## Useful Information continued

Espagnolette locking, now almost exclusively used for weathering and securing PVC-U Casement Windows, are available in two options:

- Mushroom cams, 1, 2, or 3 per espagnolette, depending on size, engaging with die cast keeps. All cams are eccentrically adjustable to allow final adjustment and provide a good level of security.
- Shootbolt locking can be provided either in addition to, or instead of mushroom cams, and serves to fully secure the corners of the sash locking jamb. (Shootbolt locking is essential to meet the requirements of BS 7950).



### BS7950

Certification is available for a full range of Casement Windows options, together with an 'open-in' Tilt and Turn option utilising multi-point locking with mushroom cams.

### Restrictors

Locking child restrictors are available as an option, to BS 8213

### Vents

Controllable or permanent ventilators to suit 2000, 4000 or 6000mm<sup>2</sup> free air are available together with gas ventilators where necessary. Where a room only has one window, two vents will be required to achieve 8000mm<sup>2</sup>.

Compliance with Building Regulations Approved document F1 is achievable.

### Doors

Hinges on the range of Wrekin Windows' doors are die-cast with a stainless steel and three way adjustability to offer quick on-site setting of the leaf/frame relationship - particularly useful on double doors.

Three quality hinges are fitted per leaf and to offer improved security at the hinge jamb, two dog bolts can be fitted in to the hinge cavity to provide ultimate security in the event of attack

Wrekin Windows uses high quality, high security, durable door locks, including a versatile clean face multi point three hook lock with optional shootbolts top and bottom to give a maximum of five locking points, and a seven point lock including three hooks and four pre-compression rollers.

The door locks are fully tested to current security standards.

## GLASS

### The thermal performance of Glass

Calculated in accordance with BS EN673 - Normal exposure conditions (U values are rounded to the nearest 0.1W/m<sup>2</sup>K in accordance with the above standard).

Cavity Width	6	8	10	12	14	16	18	20
4mm Float / Air / 4mm Float	3.3	3.1	3.0	2.9	2.8	2.7	2.7	2.8
4mm Float / Argon / 4mm Float	3.0	2.9	2.8	2.7	2.6	2.6	2.6	2.6
4mm Float / Air / PKG	2.7	2.3	2.1	1.9	1.8	1.7	1.7	1.8
4mm Float / Argon / PKG	2.2	1.9	1.8	1.6	1.5	1.5	1.5	1.5
4mm Float / Air / 4mm Float / Air / 4mm Float	2.3	2.1	2.0	1.9	1.8	1.8	1.7	1.7
4mm Float / Argon / Pilkington Optitherm™ SN						1.1		

### Maximum sizes

CLEAR GLASS (Annealed, Toughened or Laminated) is obtainable in very large sizes, but the maximum width or height should not exceed 2500mm. The maximum glass area is dependent on the type of glazing and the situation of the installation:

## Useful Information continued

GLAZING OPTIONS			
THICKNESS	ANNEALED	LAMINATED	TOUGHENED
4mm	2m <sup>2</sup>	N/A	3m <sup>2</sup>
6mm	5m <sup>2</sup>	4.5m <sup>2</sup>	7m <sup>2</sup>
4+4	4m <sup>2</sup>	N/A	6m <sup>2</sup>
6+6	10m <sup>2</sup>	9m <sup>2</sup>	7m <sup>2</sup>

Note:- The above table is extracted from BS6262 and is based on a Design Wind Pressure of 1200 Pa

PATTERNED GLASS should not exceed a maximum size of 1320mm x 2140mm

Glass Weight	
Single Glaze	4mm thick = 10 Kg/m <sup>2</sup> 6mm thick = 15 Kg/m <sup>2</sup>
Double Glaze	4-16-4 = 20 Kg/m <sup>2</sup> 6-12-6 = 30 Kg/m <sup>2</sup>

### Handling

It should be noted that large units are more prone to damage, due to the difficulty of handling and access limitations (size and weight), probably requiring additional personnel, both in factory and on site.

### Safety Glass

All glazing must conform to BS 6262 'British Standard Code of Practice for GLAZING for BUILDINGS'.

The following basic information on safety glazing is provided for general guidance only.

Annealed Glass = Float, polished plate and patterned glass.

Safety Glass = Toughened or laminated glass.

TOUGHENED GLASS is produced by subjecting annealed glass to a process of heating and rapid cooling which can increase its strength to four or five times that of annealed glass.

- It should be pointed out that toughened glass is a finished product, and as such cannot be cut or drilled.
- All such work on the glass must be carried out prior to toughening.

- On fracturing, toughened glass will disintegrate into small particles which are unlikely to cause the cutting and piercing injuries, which could occur with fractured annealed glass.

LAMINATED GLASS is produced by combining two or more panes of glass with layers of polyvinylbutyral (pvb), or with resin interlayers.

- The performance varies with the number and types of glass and interlayers, to achieve safety, security, bullet, blast and fire resistance etc.
- Laminated glass can be cut to size and supplied from stock by the supplier.
- When fractured, the pieces of glass are held together by the interlayers and the danger of injuries are minimised.

### Windows

- Safety glass must be used for glazing windows that are wholly or partially within 800mm from floor level and other risk areas, such as stairways and landings etc.
- In critical applications, provided the small dimension of the glass edge is 250mm or less, annealed glass of a suitable thickness may be used. If the glass edge exceeds 250mm then safety glass must be specified.

### Doors

- Glazing that falls wholly or partly within 1500mm from floor or ground level must be safety glass. There are exclusions to this rule dependent on the dimensions of the glazing and also for glazed side panels.
- More detail is contained within BS 6262 part 4 or Building Regulations Approved Document N.
- Where safety glass is required, it is recommended that toughened glass is used as the standard safety glass and laminated glass only supplied when specified.
- If in doubt when choosing glass for a particular application, you are strongly advised to seek advice from your glass supplier.

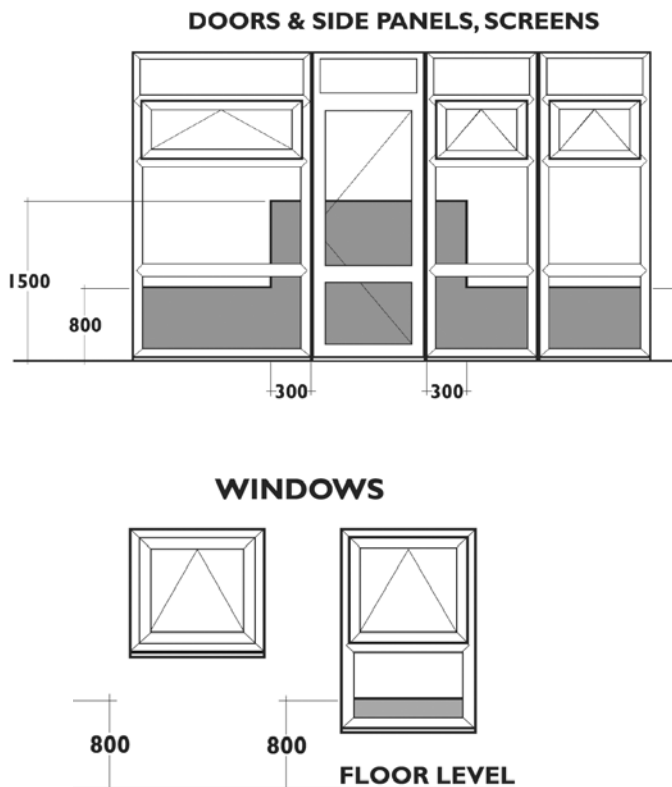


## Useful Information continued

### Critical locations for Safety Glass

The following locations may be considered 'critical' in terms of safety:

- Between finished floor level and 800mm above that level in internal and external walls and partitions (see diagram)
- Between finished floor level and 1500 mm above that level in a door or in a side panel (see diagram).
- Areas of high public traffic, these may include:
  - Corridors and assembly areas.
  - Any area where children gather or play.
  - Vulnerable situations e.g. landings, balconies, stairways and at the bottom of stairs.



### Satisfying the requirements

#### Glazing in Doors

Glazing in doors which is wholly or partially within 1500mm from floor level shall be Minimum Class C to BS 6206 and marked accordingly. If the smaller dimension of the pane is greater than 900mm it shall be Minimum Class B to BS 6206 and marked accordingly.

### Low Level Glazing

Glazing which is wholly or partially within 800mm of the floor level shall be Minimum Class C to BS 6206 and marked accordingly.

### Glazing Adjacent to Door

Glazing which is wholly or partially within 300mm of the edge of a door and which is wholly or partially within 1500mm from floor level shall be Minimum Class C to BS 6206 and marked accordingly. If the smaller dimension of the pane is greater than 900mm it shall be Minimum Class B to BS 6206 and marked accordingly.

## THERMAL PERFORMANCE

Approved Document 'L' of the Building Regulations covering England and Wales, concerning the conservation of fuel and power, requires PVC-U windows and doors sold into the replacement markets to achieve a maximum U value of 2.0 W/m<sup>2</sup> deg K. There is an exclusion from this requirement for replacement doors with less than 50% glazing.

New build is slightly different. Here there are three options to demonstrate compliance:

- The Elemental Method – this specifies U values for construction elements. The requirements for windows are as for replacement windows and doors above, but there is no exclusion for doors with less than 50% glazing.
- The Target U Value Method – this establishes a Target U Value for a building and allows opportunities for 'trade off' between different building elements.
- The Carbon Index Method - this uses the SAP (Standard Assessment Procedure) to calculate the Carbon Index of the building which must achieve a specified level.

The latter two methods can only be applied to specific buildings. As a supplier of window systems, therefore, our most sensible approach is to establish compliance to the U values given in the Elemental Method.

A similar approach is taken in Scotland where Part 'J' of the Scottish Technical Standards has been amended and all PVC-U windows and doors must achieve a maximum U value of 1.8 W/m<sup>2</sup> deg K by the Elemental Method. There is no exclusion in Scotland for replacement doors with less than 50% glazing although there is a minor concession to a U value of 2.0 W/m<sup>2</sup>

## Useful Information continued

deg K where the efficiency of the heating system can be shown to exceed certain minimum values.

Similarly, the current Elemental Method requirement in the Republic of Ireland is for U value of 2.2W/m<sup>2</sup> deg K and for Northern Ireland a U value of 3.3 W/m<sup>2</sup> deg K is required.

The route to demonstrating compliance is strictly laid down and can be by mathematical simulation or by physical testing of a window of a certain size and style given in GGF document 2.2 2002 – Window and Door System U-Values : Provision of Certified Data.

Profile 22 has been active on both routes to compliance and can confirm that:

60mm frames glazed with 4/16/4 Pilkington K glass, air filled, aluminium spacer units achieve a U value of 1.9 W/m<sup>2</sup> deg K and compliant for use in England and Wales, and Ireland. 70mm frames glazed with 4/16/4 Pilkington K glass, air filled, aluminium spacer units achieved a U value of 1.8 W/m<sup>2</sup> deg K, compliant for use in England and Wales, Ireland and Scotland.

The key elements that determine the thermal performance of a window or door are the glass and the construction of the sealed unit. The build specification of the glass units used above are based on standard, commercially available sealed units. There are, however, more thermally efficient glasses, together with 'warm edge' spacer bars and a range of alternative gas fills. These options open up a whole new range of combinations and performances although some may not be available on a widely commercial basis. For more information on these options, please consult the Technical Department.

## VENTILATION

### Building Regulations

Approved Document F1\* 1995 requires that ventilation openings should be reasonably secure, adjustable and typically located 1.75 m above floor level, so as to avoid discomfort due to cold drafts and ingress from rain.

\*Approved Document "K" 1997 in Scotland.

N.B. Document 'L' 2002: Trickle Ventilators are excluded from U Value calculations and testing. Ventilators in add-on (over the frame) extensions are deemed ancillary items.

Replacement windows now constitute a 'material change' and where compliance with Part 'L' is not prejudiced, compliance

with Part 'F' - Ventilation, Part 'B' - Fire Safety, Part 'J' Heat Producing Appliances and Part 'N' Safety Glazing should be taken into account.

### Air Flow Requirements

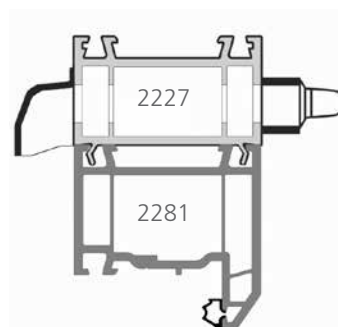
Habitable Room	8000 mm <sup>2</sup>
Kitchen	4000 mm <sup>2</sup>
Utility Room	4000 mm <sup>2</sup>
Bathroom (with or without WC)	4000 mm <sup>2</sup>
Sanitary Accommodation (separate from bathroom)	4000 mm <sup>2</sup>
Rooms with gas appliances (based on BTU output)	15000 mm <sup>2</sup>

### Types of Ventilator

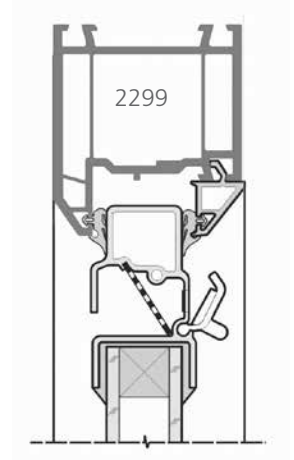
Suitable for Wrekin Windows and Doors.

Profile 22 fenestration can be used in conjunction with through frame hit and miss trim ventilators, (fitted in various sashes, and add ons) glaze-in ventilators (normally suitable for 20mm, 24mm and 28mm glazing cavities) and a proprietary overframe ventilator.

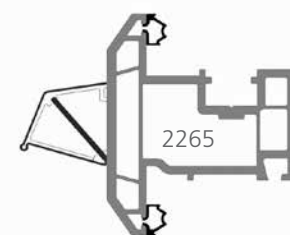
### Trim Ventilator Through Add-on



### Glaze-in Ventilation



### Through Sash Ventilation



## Useful Information continued

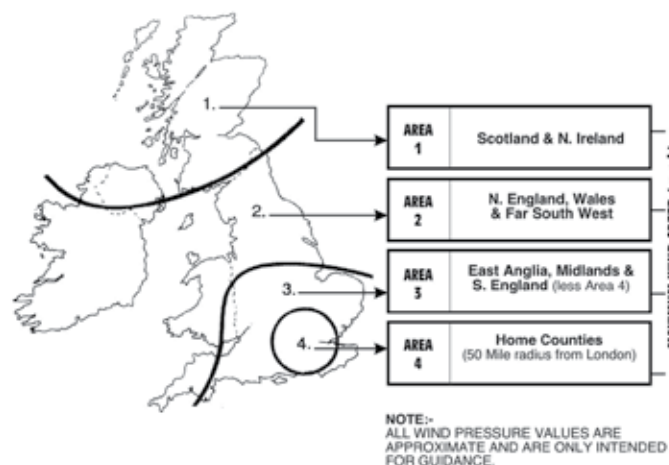
### WIND PRESSURE

The maximum wind pressure to which an installed unit may be subjected is dependent upon the following:

- The maximum wind speed likely to be experienced at the geographical location of the site.
- The Ground Roughness Category, i.e. the amount of obstruction which will interrupt the air flow.
- The height above ground.  
Other factors which influence the wind pressure, e.g. pressure coefficients (Based on  $C_p = 1.4$ ) and topography etc., have been included in the calculations to simplify the method of obtaining wind pressure values.

To find the maximum wind pressure for a specific site:

- Refer to the map and chart and select the geographical area in which the site is located.
- Read across and note the maximum wind speed value specified for that area.
- Select the curve on the graph which relates to the Ground Roughness Category which best describes the site location.
- Relate the specified wind speed value to the selected curve and read off the wind pressure in Pascals on the lower scale.
- Refer below to the notes on height factors.



#### Note 1

The wind speed is the maximum gust velocity which is likely to be exceeded only once in 50 years, measured at a height of 10m above the ground in open country.

#### Note 2

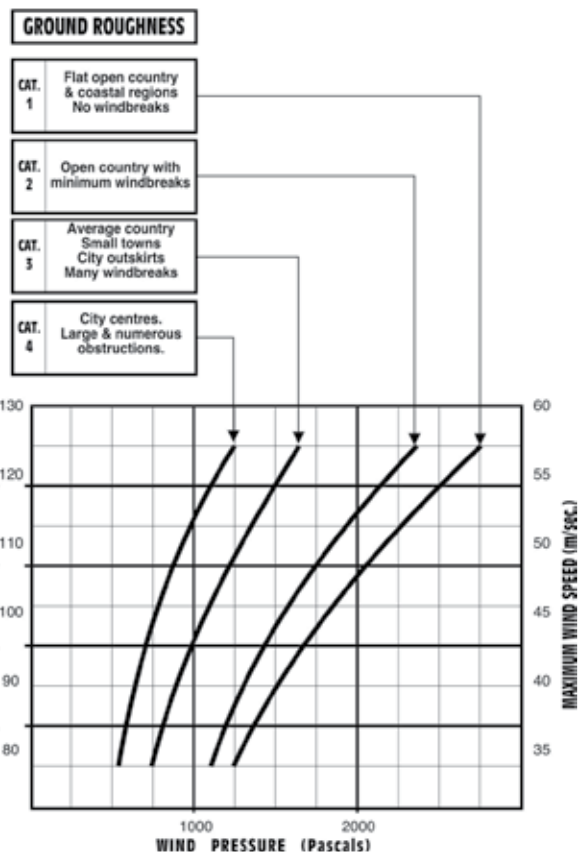
Wind speeds in excess of 120mph may be experienced on exposed headlands and islands in Northern & Western coastal regions.

Height Note:

The graphs represent values for buildings 10m high (to eaves or parapet). For buildings 5m high multiply wind pressure values by factor of 0.8, for 3m high by factor of 0.7.

For building heights above 10m refer to BS Publication BS 6399.

Acceptable levels of window performance are vital to achieve required standards, eliminate costly corrective action, maintain customer confidence and uphold the reputation of Wrekin Windows.



## Useful Information continued

Profile and reinforcement choice, window size and configuration will all affect window performance. The product variations are innumerable and therefore, until the specific parameters are known, it is impossible to provide predictable performance results.

Standards require that doors and windows meet the specification of BS 7412, for Air Permeability, Watertightness and Wind Resistance, as shown in the following chart:

TEST	DESIGN WIND PRESSURE			
	1200Pa	1600Pa	2000Pa	2400Pa
AIR PERMEABILITY	200Pa.	300Pa.	300Pa.	300Pa.
WEATHER TIGHTNESS	100Pa.	200Pa.	200Pa.	300Pa.
WIND RESISTANCE	1200Pa.	1600Pa.	2000Pa.	2400Pa.

The units tested shall avoid air and water leakage and resist wind pressures, measured in Pascals, for the tests listed and to the values indicated under the four exposure categories.

Specifiers are invited to contact the Technical Department for advice, where special exposure categories are specified, unusual difficulties may be experienced, or where installation in exposed locations can be expected to be subjected to above average climatic conditions.

The information on wind pressure, found within this section, is presented in simplified form and is only intended for guidance.

For detailed information covering all aspect of wind loading, window performance and testing etc, refer to the current issue of the following BSI publications.

- **BS 6375 : Part 1**  
Performance of Windows  
Part 1 Classification of Weathertightness
- **BS 6399 Loading for Building (Formerly CP3)**  
Part 1 Code of Practice for dead and imposed loads  
Part 2 Code of Practice for windloads  
Part 3 Code of Practice for imposed roof loads
- **BS 5368 : Method of Testing Windows**  
Part 1 Air Permeability Test  
Part 2 Watertightness Test  
Part 3 Wind Resistance Test
- **BS 7412**



## Useful Information continued

### PVC-U AND THE ENVIRONMENT

Approximately 57% of the weight of PVC-U is derived from salt (sodium chloride), a virtually limitless raw material. It is therefore more economical in the use of oil than most other synthetic products.

The energy used to manufacture PVC-U windows is substantially less than that used for metal windows, meaning their lower energy consumption helps to reduce carbon dioxide emissions. Carbon dioxide is one of the gasses involved in the so called "greenhouse effect".

If the 25 million plus PVC-U windows installed in the UK were to be replaced by hardwood it is estimated that 4 million trees would need to be felled.

#### Recycling

PVC-U is easily and efficiently recycled. Over 95% of industrial scrap resulting from the manufacture of PVC-U products is collected and recycled.

If buildings are modified after the installation of PVC-U windows, the windows may be re-used or recycled.

#### Cutting Carbon Dioxide Emissions

Up to 20% of heat lost in buildings can be attributed to the windows. The more heat that is required to heat a building means that more energy is required to produce that heat, increasing the levels of carbon dioxide emissions, which is a known contributing factor to the so-called greenhouse effect. Typically, a double glazed PVC-U window can reduce heat loss by up to 60% for standard double glazed units, and 75% for specially treated double glazed units or triple glazed units.

Comparisons are based upon a single glazed timber window against PVC-U window frame. Therefore, the energy saved by fixing PVC-U windows is a major contributory factor for combating carbon dioxide emissions.

Building Regulations Document L April 2002 requires that, as well as windows fitted in new build applications, replacement windows are also now included. Therefore windows inserted after 1st April 2002, must be fitted with high performance, low emissivity glass providing PVC-U windows with a thermal U value of 2.0W/m<sup>2</sup> deg K or less, in accordance with Table A1 "Building Regulations April 2002".

The revision to the Building Regulations is a result of the Government's commitment to the Kyoto Agreement to reduce carbon dioxide emissions by 47% in existing dwellings, and 21% in new dwellings by the end of this decade.

Wrekin Windows is committed to this directive and we undertake to develop our products to achieve these aims.

### WINDOWS - SAFE OPENING AND CLOSING

#### Safe Opening and Closing

Windows, skylights and ventilators which can be opened by people in or about the building shall be so constructed or equipped that they may be opened, closed or adjusted safely. Guidance is given in BS 8213: Part 1. Note that BS 8213 is currently being revised and will recommend that a risk assessment is carried out for each installation to identify situations where, for example, the fitting of a window restrictor may be appropriate. The information contained here is taken from an existing published document.

#### Performance

The safety requirement will be met if windows, skylights, and ventilators which open, can be operated safely.

#### Satisfying the Requirements

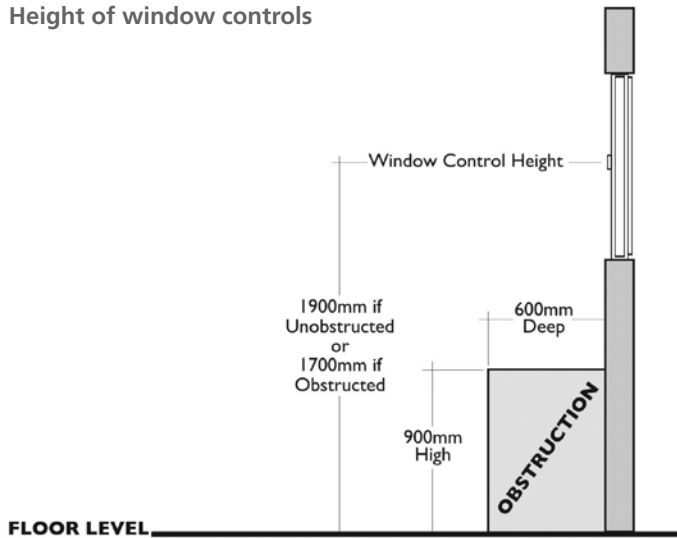
The following notes outline some ways of complying with the requirements.

#### Location of Controls

- Where controls can be reached without leaning over an obstruction they should not be more than 1.9m above the floor or other permanent stable surface provided to give access. Small recesses, such as window reveals, should be ignored.
- Where there is an obstruction the control should be lower, e.g. not more than 1.7m. Where there is a 600mm deep obstruction (including any recess) the control should be no more than 900mm high. (See Diagram below).
- Where controls cannot be positioned within the safe reach from a permanent stable surface, a safe means of remote operation, such as a manual or electrical system should be provided.

## Useful Information continued

### Height of window controls



### Prevention of Falls

Where there is a danger of the operator or other person falling through the window above ground floor level, suitable opening limiters should be fitted or guarding should be provided.

## WINDOWS - SAFE ACCESS FOR CLEANING

### Safe access for cleaning windows

Provision shall be made for windows or glazed surfaces to be safely accessible for cleaning.

### Performance

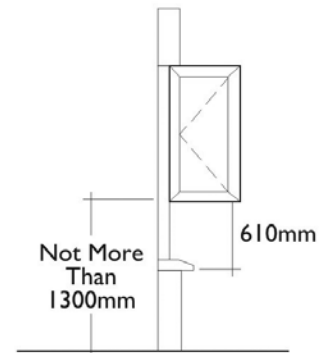
The safety requirement will be met if provision is made for safe means of access for cleaning both sides of glazed surfaces where there is a danger of falling more than two metres.

### Satisfying the Requirements

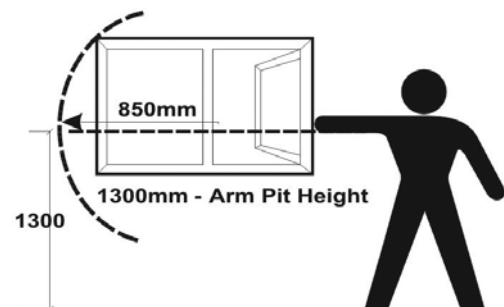
Where glazed surfaces cannot be cleaned safely by a person standing on the ground, a floor, or other permanent stable surface, the requirement should be satisfied by provisions such as the following:

- Provision of windows of a size and design that allow the outside surface to be cleaned safely from inside the building (see Diagram 1). Windows which reverse for cleaning should be fitted with a mechanism which holds the window in the reversed position. Additional guidance is given in BS 8213: Part 1 Windows, doors and rooflights.

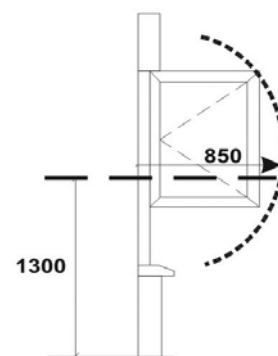
Diagram 1- Safe reaches for Cleaning



**A) DOWNWARDS REACH THROUGH AN OPEN LIGHT**



**B) SIDE REACH THROUGH AN OPENING LIGHT**

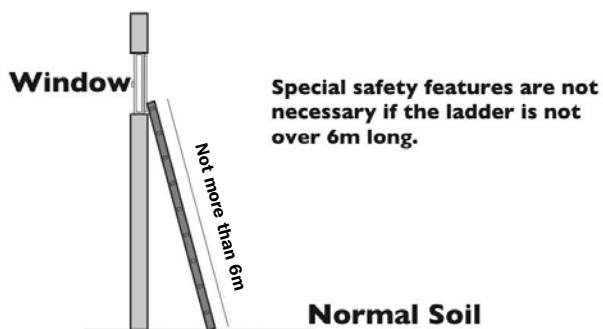


**C) REACH FOR CLEANING AN OPEN CASEMENT WITH REFLEX HINGES**

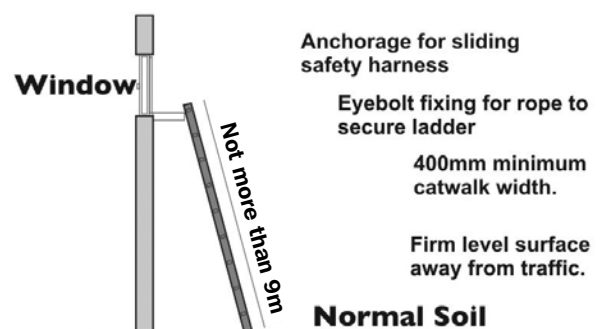
## Useful Information continued

- Provision of an adequate area of firm level surface, in a safe place, to allow use of portable ladders not more than 9m long (measured from the ground to the upper support). Where ladders up to 6m long will be used, normal soil will provide a suitable standing surface (see Diagram 2);
- Where ladders over 6m long will be used suitable tying or fixing points should be provided. (see Diagram 3).

**Diagram 2 - Ladders not more than 6m long**



**Diagram 3 - Ladders not more than 9m long**



- Provision of walkways at least 400mm wide, either with guarding at least 1100mm high, or with anchorages for sliding safety harnesses (see Diagram 3).
- Provision for access equipment such as suspended cradles or travelling ladders, with attachments for safety harnesses.
- Provision of suitable anchorage points for safety harnesses or abseiling hooks.
- Only in circumstances where other means cannot be used, space for scaffolding towers should be provided, and located so that glazed surfaces can be cleaned.

## Useful Information continued

### WINDOWS - FIRE SAFETY AND MEANS OF ESCAPE

#### Dwelling Houses - Floors not more than 4.5m above ground level

Where required, windows shall be designed and installed to provide appropriate means of escape in case of fire from the building to a place of safety outside the building. Windows shall be capable of being used for escape safely and effectively at all times.

#### Performance

The safety requirement will be met if there are sufficient number of escape routes, suitably located to enable persons to escape to a place of safety in the event of fire.

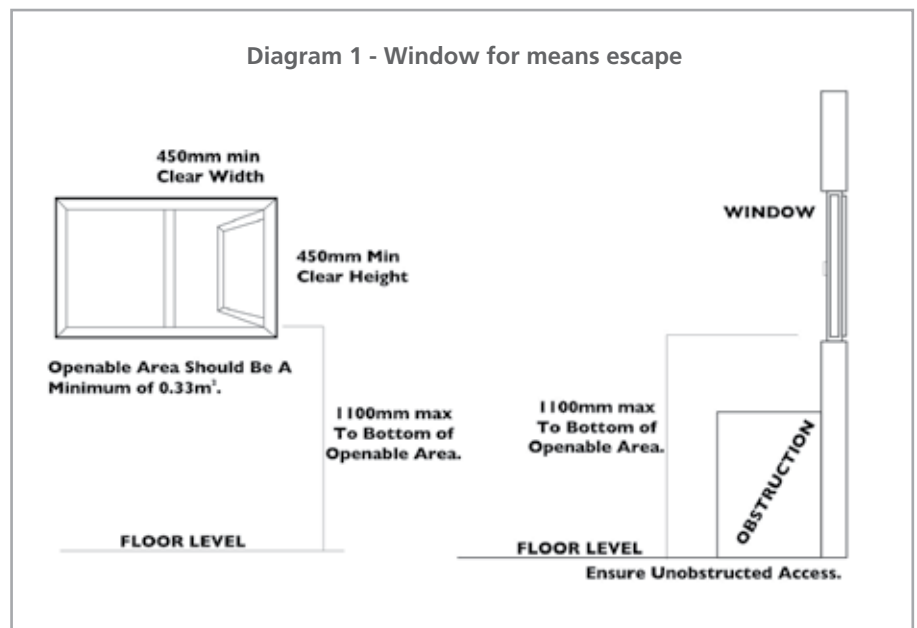
#### Satisfying the Requirements

On the ground storey all habitable rooms, except for kitchens, should either open directly onto a hall leading to the entrance or other suitable exit or be provided with a window or door. On the upper storey(s) all habitable rooms, except for kitchens, of a house served by only one stairway should be provided with a window or external door.

#### Emergency Egress Windows and External Doors

Any window provided for emergency egress purposes and any external door provided for escape should comply with the following conditions.

- The window should have an unobstructed openable area that is at least 0.33m<sup>2</sup> and at least 450mm high and 450mm wide (the route through the window may be at an angle rather than straight through). The bottom of the openable area should be not more than 1100mm above the floor. (see diagram 1)
- The window or door should enable the person escaping to reach a place free of danger from fire. This is a matter of judgement in each case, but in general a courtyard or back garden from which there is no exit other than through other buildings would have to be at least as deep as the dwelling is high to be acceptable.



### SERVICE AND MAINTENANCE

#### Installation

Product installation should reflect the recommendations laid down by the BPF codes of practice for the survey and installation of PVC-U windows and doorsets.

#### Maintenance

Wrekin's comprehensive range of high quality, low maintenance PVC-U windows and doors require minimal maintenance, such as periodical lubrication and cleaning to remove atmospheric grime.

Please refer to Wrekin's Maintenance handbook for additional information.



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