PERFORMANCE & TESTING

A window has a multitude of functions. It must let in light, provide a view, allow ventilation, insulate thermally and acoustically, protect against the weather, break-ins and fire.

PERFORMANCE & TESTING
BACKGROUND INFORMATION

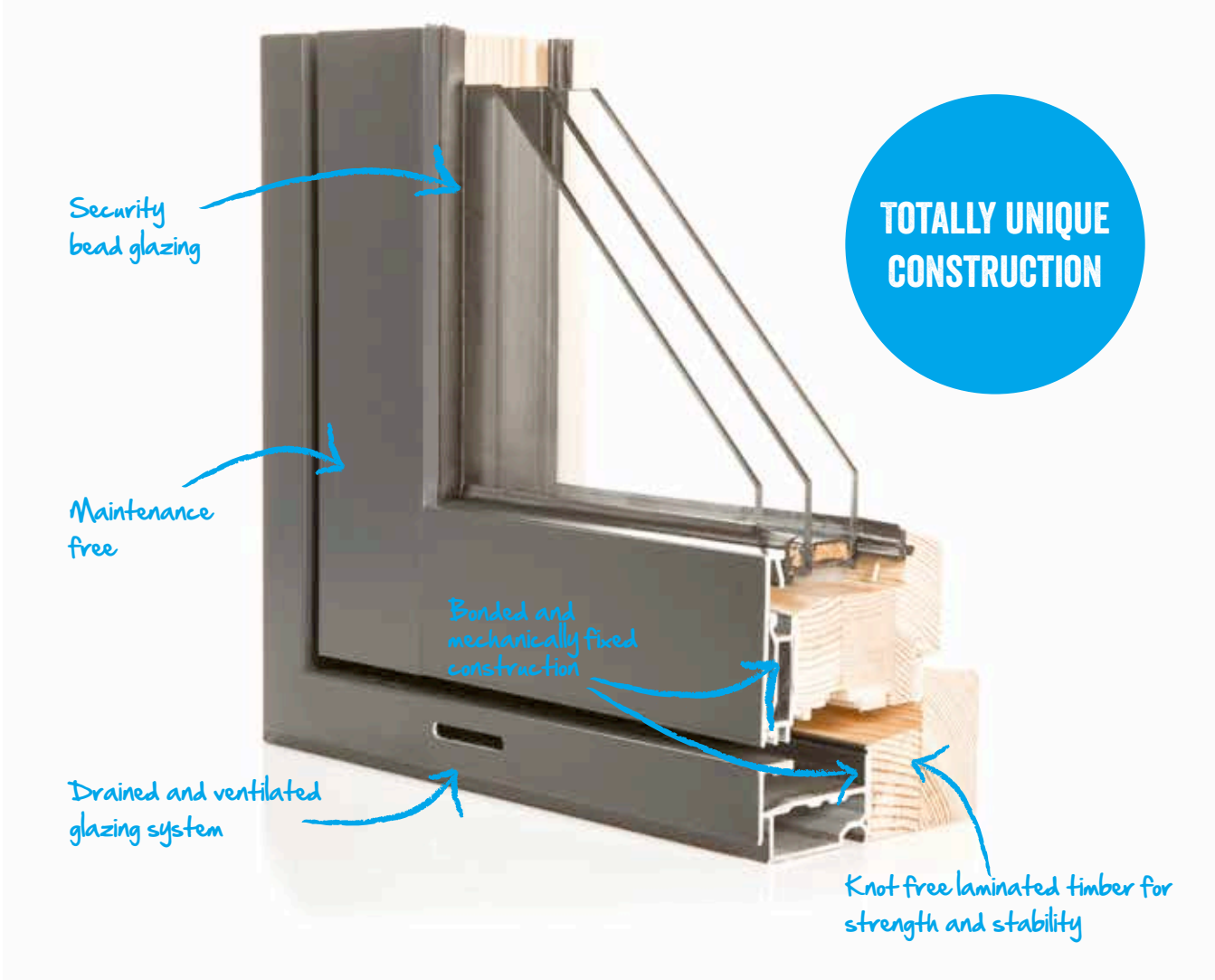
Designed to exceed all contemporary standards, our products are constructed from a combination of high-tech components and hand-assembled craftsmanship.

A continuous programme of design development and testing ensures Westcoast remain at the very forefront of advanced fenestration technology.

Westcoast windows and doors are independently Type Tested for all Essential Characteristics by The Technical Research Institute of Sweden (SP) and together with Exova BM Trada in the UK, they audit all factory production activities and carry out ongoing product testing to monitor continuity of Quality and Performance.

The following pages set out key performance information from physical testing or calculation and where included in our Declarations of Performance (DoP) in accordance with Construction Products Regulation 2011 and CE marketing requirements they will represent minimum performance or a range of values which are subject to method of operation, size and glazing specification.

For specific performance data, please consult Westcoast Windows technical support department.



WEATHERTIGHTNESS

The Westcoast range of windows and doors are performance tested for weathertightness, strength, operation and basic security and they are classified in accordance with:

BS6375-1:2015 Classification for weathertightness
BS6375-2:2009 Classification for operation and strength characteristics
BS6375-3:2009 Classification for additional performance characteristics

A summary of the results achieved is set out in the tables below:

CLASSIC, DESIGN AND ANTIK SERIES WINDOWS

Summary of testing and classification			Result
Test	**Test Standard**	**Classification Standard**	
Air permeability	BS EN 1026: 2000	BS EN 12207: 2000	600Pa (Class 4)
Watertightness	BS EN 1027: 2000	BS EN 12208: 2000	900Pa (Class E900)
Wind resistance	BS EN 12211: 2000	BS EN 12210: 2000	2000Pa (Class A5)
Resistance to racking	BS EN 14608: 2004	BS EN 13115: 2001	Class 3
Resistance to static torsion	BS EN 14609: 2004	BS EN 13115: 2001	Class 3
Resistance to repeated opening and closing	BS EN 1191: 2000	BS EN 12400: 2002	10,000 cycles (Class 2)
EN 14351 Part 1 Clause 4.8 load bearing capacity of safety devices tested to the principles of EN 14609: 2004			No apparent damage
Operating forces	BS EN 12046-2: 2003	BS EN 13115: 2001	Class 1
BS 6375 Part 3: 2009 annex A Basic security test			Pass

CLASSIC, DESIGN AND ANTIK SERIES HINGED FRENCH WINDOWS (OPEN OUT)

Summary of testing and classification			Result
Test	**Test Standard**	**Classification Standard**	
Air permeability	BS EN 1026: 2000	BS EN 12207: 2000	600Pa (Class 4)
Watertightness	BS EN 1027: 2000	BS EN 12208: 2000	450Pa (Class 8A)
Wind resistance	BS EN 12211: 2000	BS EN 12210: 2000	1600Pa (Class A4)
Resistance to racking	BS EN 14608: 2004	BS EN 13115: 2001	Class 3
Resistance to static torsion	BS EN 14609: 2004	BS EN 13115: 2001	Class 3
Resistance to repeated opening and closing	BS EN 1191: 2000	BS EN 12400: 2002	10,000 cycles (Class 2)
EN 14351 Part 1 Clause 4.8 load bearing capacity of safety devices tested to the principles of EN 14609: 2004			No apparent damage
Operating forces	BS EN 12046-2: 2003	BS EN 13115: 2001	Class 1
BS 6375 Part 3: 2009 annex A Basic security test			Pass

WEATHERTIGHTNESS

CLASSIC AND ANTIK SERIES HINGED FRENCH WINDOWS (OPEN IN)

Summary of testing and classification			Result
Test	**Test Standard**	**Classification Standard**	
Air permeability	BS EN 1026: 2000	BS EN 12207: 2000	600Pa (Class 4)
Watertightness	BS EN 1027: 2000	BS EN 12208: 2000	900Pa (Class E900)
Wind resistance	BS EN 12211: 2000	BS EN 12210: 2000	2000Pa (Class A5)
Resistance to racking	BS EN 14608: 2004	BS EN 13115: 2001	Class 3
Resistance to static torsion	BS EN 14609: 2004	BS EN 13115: 2001	Class 3
Resistance to repeated opening and closing	BS EN 1191: 2000	BS EN 12400: 2002	10,000 cycles (Class 2)
EN 14351 Part 1 Clause 4.8 load bearing capacity of safety devices tested to the principles of EN 14609: 2004			No safety device present
Operating forces	BS EN 12046-2: 2003	BS EN 13115: 2001	Class 1
BS 6375 Part 3: 2009 annex A Basic security test			Pass

CLASSIC, DESIGN AND ANTIK SERIES DOORS

Summary of testing and classification			Result
Test	**Test Standard**	**Classification Standard**	
Air permeability	BS EN 1026: 2000	BS EN 12207: 2000	600Pa (Class 4)
Watertightness	BS EN 1027: 2000	BS EN 12208: 2000	100Pa (Class 3A)
Wind resistance	BS EN 12211: 2000	BS EN 12210: 2000	1200Pa (Class C3)
Exposure category		BS 6375: Part 1: 2009	1200
PAS 24-1: 2007 + A1: 2009 – Clauses A.4, A.5, A.6, A.7, A.9, A.10 and A.11			Pass
PAS 23-1: 1999 – Clauses 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 6.9, 6.10, 6.11 and 6.14			Pass

CLASSIC AND DESIGN SLIDING DOORS

Summary of testing and classification			Result
Test	**Test Standard**	**Classification Standard**	
Air permeability	BS EN 1026: 2000	BS EN 12207: 2000	600Pa (Class 4)
Watertightness	BS EN 1027: 2000	BS EN 12208: 2000	600Pa (Class 9A)
Wind resistance	BS EN 12211: 2000	BS EN 12210: 2000	1200Pa (Class C3)

THERMAL INSULATION

PART L

The main focus on the environmental performance of buildings is currently the conservation of fuel and power and in particular, the reduction of CO_2 emissions.

In order to comply with the energy efficiency requirements of Building Regulations 2010, the following series of Approved Documents have been published in order to provide practical guidance which includes, amongst other considerations, the thermal performance of the building fabric.

Document L1A	Conservation of fuel and power in new dwellings
Document L1B	Conservation of fuel and power in existing dwellings
Document L2A	Conservation of fuel and power in new buildings other than dwellings
Document L2B	Conservation of fuel and power in existing buildings other than dwellings

For new build projects, Part L also explains how compliance with energy efficiency requirements can be demonstrated by meeting five separate criteria by calculation (e.g. SAP or Standard Assessment Procedure) and reporting CO_2 Emission Rates, plus, in the case of dwellings, Fabric Energy Efficiency Rates.

Criterion 1 is a regulation and therefore mandatory and states that the actual CO_2 emission rate must be no greater than the target CO_2 emission rate.

Other criteria deal variously with matters such as overall standards of energy efficiency, limiting design flexibility, solar and heat gain, air permeability and the quality of construction and consistency of building performance.

Each Part L document provides either a limiting fabric parameter (new build) or a minimum Standard for controlled fittings (existing buildings) which for windows and doors are:

	ENGLAND	WALES	SCOTLAND
L1A	2.0 W/m²K	1.6 W/m²K	1.6 W/m²K (Part J)
L1B	1.6 W/m²K (windows) 1.8 W/m²K (doors)	1.6 W/m²K	1.6 W/m²K (Part J)
L2A	2.2 W/m²K	2.2 W/m²K	1.6 W/m²K (Part J)
L2B	1.8 W/m²K*	1.8 W/m²K*	1.6 W/m²K (Part J)

*1.6 W/m²K if domestic in character

THERMAL INSULATION

PART L

ENERGY EFFICIENCY

Heat loss is measured by the thermal transmittance characteristics of a material or U-value. It is expressed in Watts/m²Kelvin which is a measurement of the amount of energy conducted per square metre multiplied by the temperature difference on either side of the material. The lower the U-value, the greater its thermal insulation properties.

Whole window U-values are calculated in accordance with EN ISO 10077-2 using THERM, a software programme for modelling and calculating heat flow through a framing system. The properties of all the component parts of a window are included in the calculation to ensure an accurate declaration of the performance for the whole product. U-values are an essential characteristic for CE Marking purposes and a mandatory requirement under Construction Products Regulation 2011.

Westcoast windows and doors are factory double or triple glazed with 28mm, 36mm or 48mm duel sealed units constructed to EN 1279-2:2002, incorporating the latest 'warm edge' technology, single or multiple low emissivity coated glass and argon gas filling as standard.

A summary of typical whole window U-values is set out in the table below.

Glass Specification	**Classic Series** (W/m²K)	**Design Series** (W/m²K)	**Antik Series** (W/m²K)
28mm Double (1 x low e)	1.4	N/A	1.4
36mm Triple (1 x low e)	1.3	N/A	1.3
36mm Triple (2 x low e)	1.2	N/A	1.2
48mm Triple (1 x low e)	N/A	1.2	N/A
48mm Triple (2 x low e)	N/A	1.0	N/A

ACOUSTICS
BACKGROUND INFORMATION

PART E

With any new commercial or domestic building development, renovation or replacement project, consideration should be given to the acoustic requirements of the windows.

Windows are often a poor barrier to noise from external sources entering your home, such as road and rail traffic, planes or just general neighbourhood noise, and the type of windows chosen can make a great difference to the internal environment.

The standard unit for measuring sound pressure levels is the decibel, abbreviated to dB where 0dB is the lower threshold of normal hearing and 130dB is the upper threshold of pain. A change of 3dB is only just perceptible whereas 5dB would be clearly noticeable and an increase of 10dB is roughly equivalent to a doubling of loudness.

The annoyance produced by noise depends on a variety of factors including frequency and as a result, different scales have been derived to allow for these factors including dB(A), a scale used to measure mid-frequency noise which is most discernible to the human ear.

The soundproofing characteristics of building components is measured in dB(Rw) values. Known as the weighted sound reduction index, it is a laboratory-measured rating used to describe the ability of a window or door to provide sound insulation across a wide frequency range – the higher the number, the better the performance.

To take into account low frequency noise such as road & rail traffic, a correction factor (Ctr) has been introduced to the Rw scale and this is expressed as dB(Rw+Ctr).

When selecting products, such as soundproofing windows, it is vitally important to compare whole window test results rather than just a declared performance value of the glass because the quality of the frame construction, the assembly of weather seals and gaskets and the closing tightness of opening lights has a significant impact on actual performance.

Westcoast Windows provide 3rd Party independently tested standard entry level windows and doors with superior sound reduction of 34 dB(Rw) and 29 dB (Rw+Ctr) and can provide a huge selection of tested combinations of opening windows, fixed lights and doors up to 48 dB(Rw).

ACOUSTICS
ACOUSTIC TEST REPORT SUMMARY

PART E

CHILTERN DYNAMICS PHYSICAL TESTS

Report No.	Product	Glazing Specification	Whole Window Noise Reduction		
			R_w (dB)	$R_w + C$ (dB)	$R_w + C_{tr}$ (dB)
F12022/P006	TSG180	88.2 VSG Sil-18Ar-66.2 VSG Sil	46	45	42
F12022/P001	TSG180	88.2 VSG Sil-18Ar-66.2 VSG Sil	46	45	41
F12022/P008	TSG180	66.2 VSG Sil-10Ar-4 float-12Ar-44.2	46	45	41
F12022/P007	TSG180	88.2 VSG Sil-18Ar-66.2 VSG Sil	44	44	41
F12022/P009	TSG180	66.2 VSG Sil-10Ar-4 float-12Ar-44.2	44	43	40
F12022/P005	TSG180	88.2 VSG Sil-18Ar-66.2 VSG Sil	43	42	39
F12022/P020	TSG180	88.2 VSG Sil-18Ar-66.2 VSG Sil	43	43	39
F12022/P016	TSG180	10 float-20Ar-33.1 VSG Sil	43	42	37
F12022/P017	TSG180	10 float-20Ar-33.1 VSG Sil	42	41	37
F12022/P014	TSG180	10 float-20 Ar-33.1 VSG	41	39	35
F12022/P015	TSG180	10 float-20 Ar-33.1 VSG	40	39	35
F12022/P012	TSG180	4 float-18Ar-33.1 VSG Sil	40	38	33
F12022/P013	TSG180	4 float-18 Ar-33.1 VSG Sil	39	37	33
F12022/P011	TSG180	4 float-18 Ar-33.1 VSG	38	37	33
F12022/P018	TSG180	4 float-20Ar-4 float	35	34	30
F12022/P019	TSG180	4 float-20Ar-4 float	35	34	29
F12022/P026	FKG	88.2 VSG Sil-18 AR-66.2 VSG Sil	48	47	41
F12022/P028	SHID	66.2 VSG Sil-15 Ar-44.2 VSG Sil	43	42	38
F12022/P027	FDG	66.2 VSG Sil-15 Ar-44.2 VSG Sil	42	41	38

R_w is calculated according to SS-EN ISO 717-1 R_{Atr} according to NT ACOU 061 (= $R_w + C_{tr}$ according to ISO 717-1)

ACOUSTICS
ACOUSTIC TEST REPORT SUMMARY

PART E

SWEDISH INSTITUTE (SP) PHYSICAL TESTS

Report No.	Product	Glazing Specification	Whole Window Noise Reduction		
			R_w (dB)	$R_w + C$ (dB)	$R_w + C_{tr}$ (dB)
P503584 Enc. 1	TSG180	33.1 VSG Sil-15air-6 float	39	37	33
P503584 Enc. 2	TSG180	44.1 VSG Sil-20air-8 float	42	40	36
P503584 Enc. 3	TSG180	66.1 VSG Sil-15air-WSG Sil 44.2	44	42	39
P503584 Enc. 4	TSG180	66.1 VSG Sil-15air-WSG Sil 44.2*	46	44	40
P503584 Enc. 5	TSG180	8 float-15air-4 float	37	36	33
P603528 Enc. 1	SHI	8 float-15air-4 float	36	35	32
P603528 Enc. 2	SHI	33.1 VSG Sil-15air-6 float	37	35	31
P603528 Enc. 3	SHI	44.1 VSG Sil-20air-8 float	40	39	34
P603528 Enc. 4	SHI	66.1 VSG Sil-15air-WSG Sil 44.2	40	39	35
P603528 Enc. 5	SHI	66.1 VSG Sil-15air-WSG Sil 44.2**	44	43	38
P603528 Enc. 6	SHI	44.1 VSG Sil-20air-8 float	43	41	35

* Sash sealed with tape ** Additional weather strip

SWEDISH INSTITUTE (SP) CALCULATED TESTS

Report No.	Glazing Unit	Glazing Specification	Whole Window Noise Reduction	
			R_w (dB)	$R_w + C_{tr}$ (dB)
Px01680-en	Double	4 float-20Ar-4 float	34	29
Px01680-en	Double	4 float-18Ar-33.1 VSG	37	32
Px01680-en	Double	6 float-18Ar-4 float	37	32
Px01680-en	Double	10 float-12Ar-33.1 VSG	41	36
Px01680-en	Triple	4 float-12Ar-4 float-12Ar-4 float	34	29
Px01680-en	Triple	6 float-10Ar-4 float-12Ar-4 float	37	31
Px01680-en	Triple	4 float-12Ar-4 float-10Ar-33.1 VSG	38	32
Px01680-en	Triple †	4 float-38air-4 float-12Ar-4 float	41	35

† 2+1 coupled sash

R_w is calculated according to SS-EN ISO 717-1 R_{Atr} according to NT ACOU 061 (= $R_w + C_{tr}$ according to ISO 717-1)

ACOUSTICS
TERMINOLOGY & FAQs

PART E

AMBIENT NOISE

Ambient noise includes all sound present in a given environment. This usually includes sounds from many sources both near and far.

dB

The unit of measurement of sound. dB is an abbreviation of decibel. Variations of dB are used for different types of noise measurement. Most commonly dB (A).

dB (A)

The 'A' weighting scale is used to measure noise that corresponds roughly to the overall level of noise that is discerned by the average human ear. The human ear is more susceptible to mid-frequency noise than high and low frequencies and therefore this 'A 'weighting approximates the sensitivity of the human ear by filtering only these frequencies.

FREQUENCY

The number of vibrations of sound waves emitted per second is known as the frequency and is expressed in Hertz. Building acoustics is concerned with frequencies of the 50 to 5,000 Hz range. These are divided into bands of frequencies or octaves.

R_w

Known as the weighted sound reduction index. It refers to the ability of a building structure to provide sound insulation. The higher the number, the better sound insulation.

$R_w + C$

C is the value added to R_w to take into account the characteristics of particular medium and high frequency noises i.e. music, TV and speech (sometimes collectively called pink noise).

$R_w + C_{tr}$

C_{tr} is the value added to R_w to take into account the characteristics of particular medium and low frequency noises i.e. urban traffic, distant aircraft.

FREQUENTLY ASKED QUESTIONS

HOW DOES ACOUSTIC LAMINATED GLASS WORK?

A PVB (Polyvinyl Butyral) interlayer is sandwiched between glass panes to absorb sound and help keep noise out of the building. The thickness of these sandwiching panes as well as the configuration of other glass panes and cavity spacing within double or triple glazing can dramatically effect the sound performance of the overall glass unit.

CAN SOUND PERFORMANCE OF A WINDOW BE DETERMINED BY THE GLASS ALONE?

No. The choice of window frame will effect the overall insulating performance of the entire window. Poor quality frames can allow sound to penetrate. A real physical test of the window frame and glass together is the only true way of achieving trusted performance data.

SECURITY

PART Q

To comply with Building Regulations, windows and doors must be sufficiently robust and fitted with appropriate hardware in order to be able to resist physical attack by a casual or opportunist burglar.

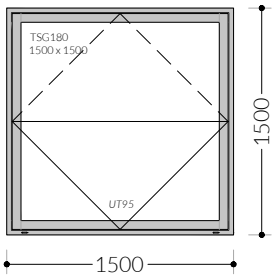
Approved Document Q: security, dwellings – covers the standards for doors and windows to resist physical attack by a burglar. It includes standards on being both sufficiently robust and fitted with appropriate hardware. This also supports requirement Q1 of schedule 1 to the Building Regulations 2010. Requirement Q1 applies only in relation to new dwellings and provides 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.

Performance can be demonstrated by evidencing that the product is manufactured to a design that has been shown by test to meet the security requirements of British Standard PAS 24:2016.

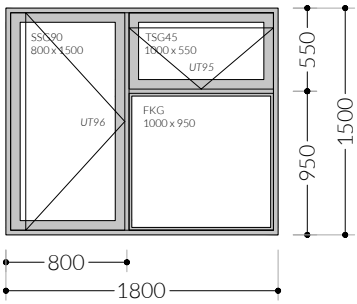
PAS 24:2016 provides a method of testing and assessing the enhanced security performance requirements of doors and window types intended to resist the levels and methods of attack experienced in the UK and normally associated with the casual burglar.

All principle Westcoast composite windows and doors have not only been successfully tested to PAS 24:2016 but Westcoast are also a Secured by Design licence holder, an award that requires member companies to regularly undertake re-testing and auditing through independent UKAS accredited 3rd Party certification schemes to ensure consistency of product quality and performance.

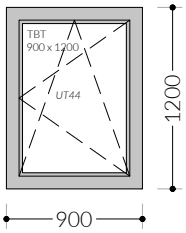
Westcoast Windows approved window & doors:



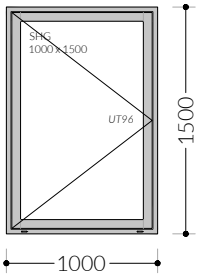
Top Hung Reversible
(outward opening)



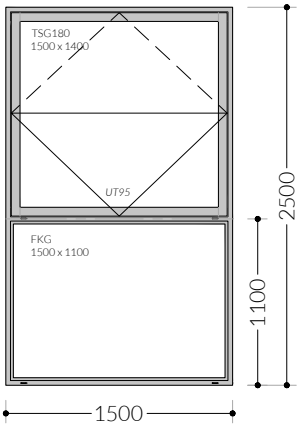
Multi-light Window
(outward opening)



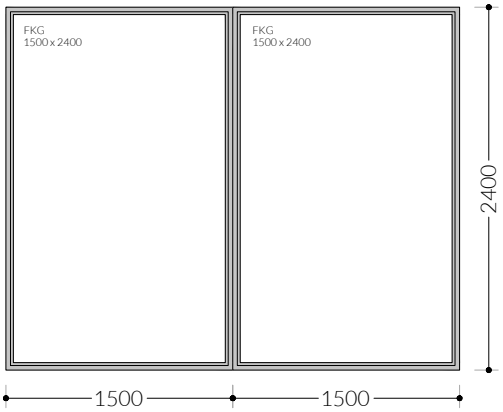
Tilt before Turn
(inward opening)



Side Hung*
(outward opening)



Combination Window
(outward opening)



Coupled Fixed Light *
(outward opening)

CONTINUED OVERLEAF...

SECURITY

PART Q

Westcoast Windows approved window & doors: