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**Testing of Smart
Systems Limited's
'Alitherm 700' top hung
and parallel opening
windows and fixed lights
windows to the
requirements of
BS 7950:1997**

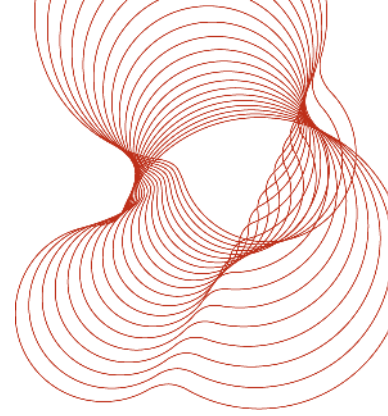
Prepared for:
Smart Systems Limited
Arnolds Way
Yatton
North Somerset
BS49 4QN

6 September 2011

Test report number 271913



0578



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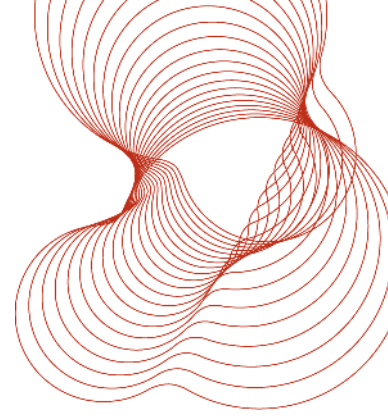
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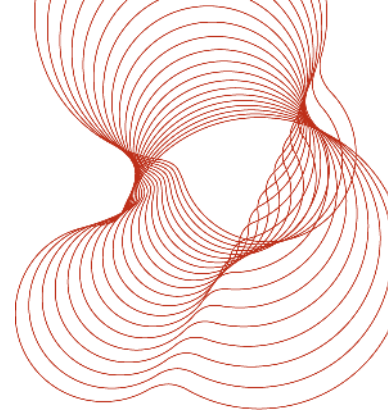
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1 Introduction

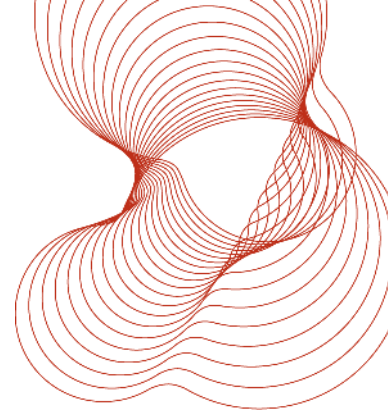
This report details the results of tests performed in accordance with the test methods defined in BS 7950:1997 Incorporating Amendments Nos.1, 2 and 3 - *Specification for enhanced security performance of windows for domestic applications*¹, on 'Alitherm 700' top hung and parallel opening windows and fixed lights windows manufactured by Smart Systems Limited, Arnolds Way, Yatton, North Somerset, BS49 4QN.

Parallel opening windows were outside the scope of BS 7950:1997¹ and therefore not covered by the scope of BRE Global Limited's UKAS accreditation. The parallel opening windows therefore were assessed using the methodology detailed in Section 4 of this report.

2 Origin of test request

At the request of Kevin Cole of Smart Systems Limited, Arnolds Way, Yatton, North Somerset, BS49 4QN, BRE Global Limited issued quotation number Q5127 on 13 June 2011 covering the testing of the windows to BS 7950:1997¹. The quotation was accepted on 28 June 2011 by Mr Mark Walford of Smart Systems Limited.

Testing was conducted on 11 July 2011 against project number 271913 under the BRE Global Limited Terms and Conditions for Testing (PN145/6²).



3 Details of test specimens

Two window specimens were submitted on 11 July 2011 for testing to the requirements of clause 7 of BS 7950:1997¹. These were allocated unique BRE reference numbers.

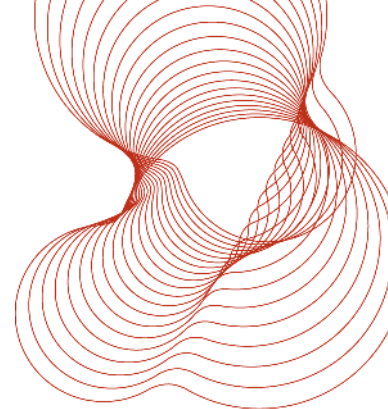
The design and component details of the windows tested were as follows. This was based on the documentation provided by Smart Systems Limited listed in Annex A.

All samples were kept in the laboratory for at least 1 hour prior to testing.

3.1 Specimens 271913/1 and 271913/2

Table 1 General description

Name and address of manufacturer:	Smart Systems Limited.
Product designation (e.g. trade name / model):	Alitherm 700.
Configuration:	Outward opening top hung window next to an outward opening parallel window over two fixed lights (internally glazed and externally glazed).
Material:	Aluminium.
Overall dimensions:	1200 mm wide by 1400 mm high.
Description of outer frame:	Aluminium profiles ETC710 and ETC730.
Description of sash:	Aluminium profile ETC720.
Description of hardware:	Saracen Valiant five point locking systems, each incorporating two espagnolettes, two shootbolts and a deadbolt, and operated by a key locking handle. The locking system engaged into Smart Systems keeps. The top hung sash had Securistyle Stirling friction stays and security claws. The parallel opening sash had three Securistyle Parallel Plus scissor stays.
Description of glazing/infill:	Glazed with 28 mm thick (overall) sealed glazing units comprising 4 mm thick toughened glass, 20 mm air gap and 4 mm thick toughened glass.



Description of seals:	EDPM weatherseals and glazing gaskets
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Table 2 Outer frame details

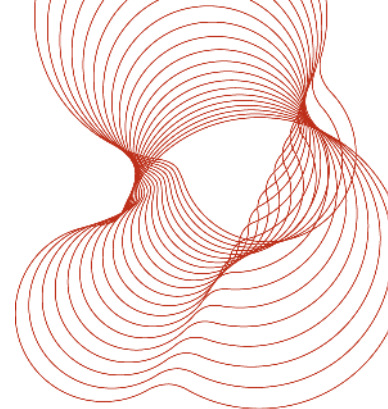
Component description	Supplier	Part No./Code
Outer frame	Smart Systems Limited	ETC710
Mullion	Smart Systems Limited	ETC730
Outer frame jointing method:	Mitre jointed, glued and crimped joints	
Outer frame surface treatment:	Mill finish	

Table 3 Sash details

Component description	Supplier	Part No./Code
Sash profile	Smart Systems Limited	ETC721
Internally beaded rebate adaptor	Smart Systems Limited	ETC747
External glazing bead adaptor	Smart Systems Limited	ETC748
Sash/leaf jointing method:	Mitre jointed, glued and crimped joints	
Sash/leaf surface treatment:	Mill finish	

Table 4 Hardware details

Hardware Description	Supplier/Model	Smart Systems Part Code	Fixings
Locking system on top hung and parallel opening windows	ERA Saracen Valiant	ACET710 ACET711 ACET713	No.7 by 1" long countersunk stainless steel self tapping screws (ACET060)
Keeps	Smart Systems	Included in kit ACET710	No.7 by 1" long countersunk stainless steel self tapping screws (ACET060)
Top hung hinges	Securistyle Stirling	ACINS16	No.8 by 38 mm long flange head stainless steel self tapping screws (ACET068)



Hardware Description	Supplier/Model	Smart Systems Part Code	Fixings
Top hung security claws	Securistyle Vector Excluder	-	No.8 by 38 mm long flange head stainless steel self tapping screws (ACET068)
Parallel opening hinges	Securistyle Parallel Plus	ACETPPS67L ACETPPS67R ACETPPS35R	No.8 by 38 mm long flange head stainless steel self tapping screws (ACET068)
Is a key required to unlock the hardware from the inside?			Yes

Table 5 Glazing/infill details

Component description	Supplier	Part No./Code
Glazing bead	Smart Systems Limited	ETC766
Security glass retainers on externally beaded fixed light	GT Windows	Securi-Clip
Internally or externally glazed:	Internally beaded on the opening vents and one fixed light. Externally beaded on the other fixed light.	

Table 6 Gasket details

Component description	Supplier	Part No./Code
Pane gasket	Smart Systems Limited	Inner – ACVG34 Outer – ACVG231
Frame gasket	Smart Systems Limited	ACET160
Sash gasket	Smart Systems Limited	ACET160

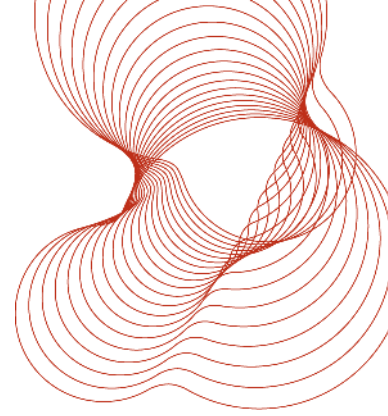
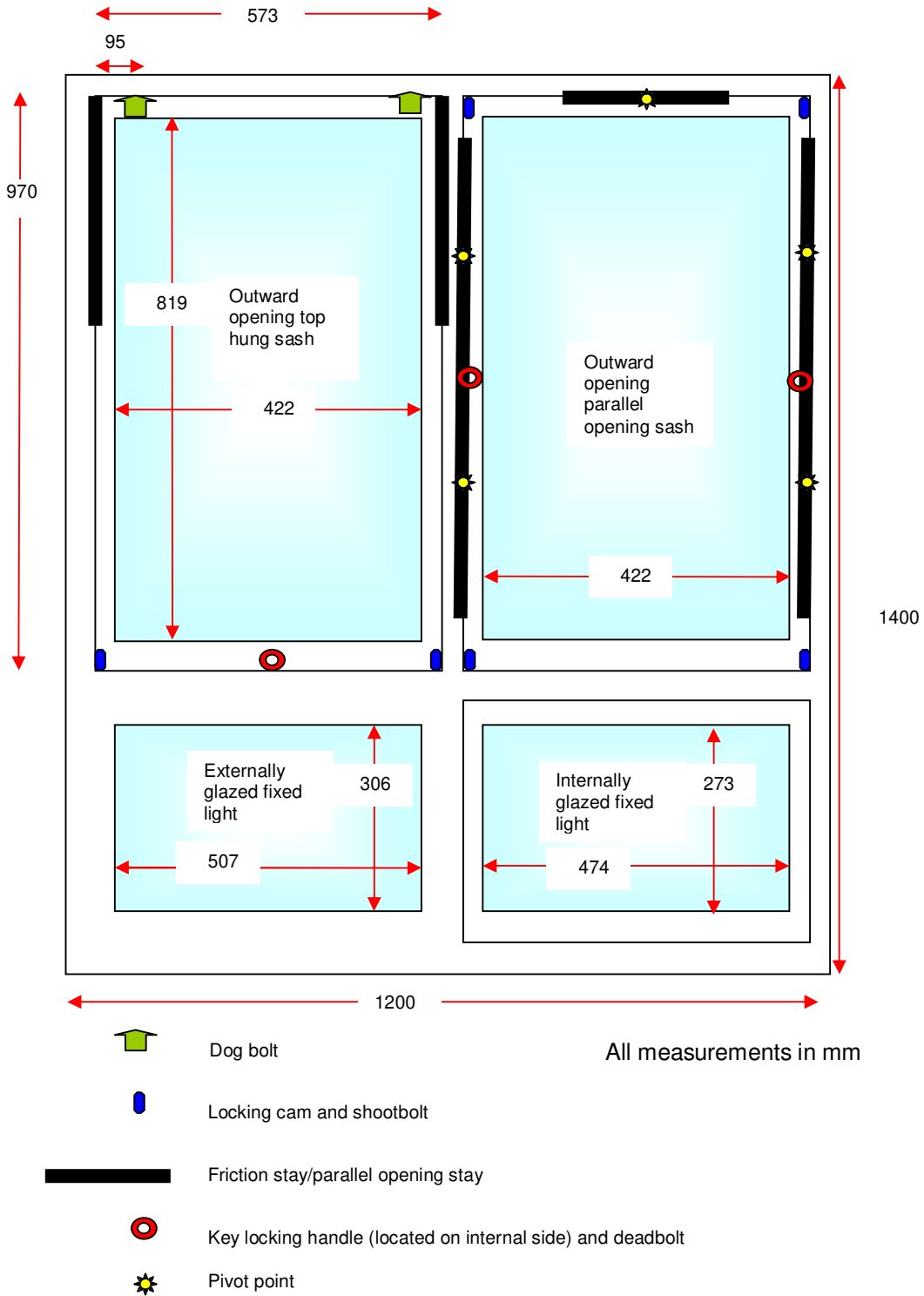


Figure 1 Specimens 271913/1 and 271913/2 (external view)



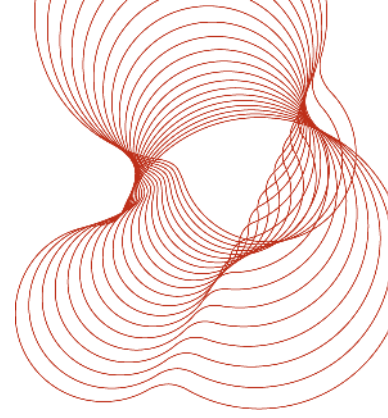


Figure 2 External face of specimen window



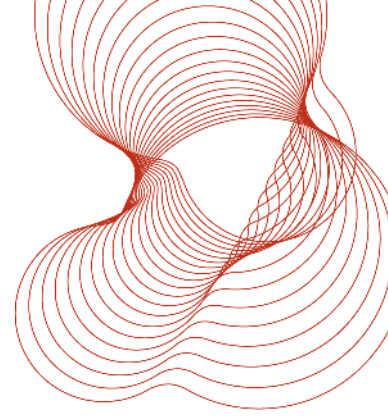
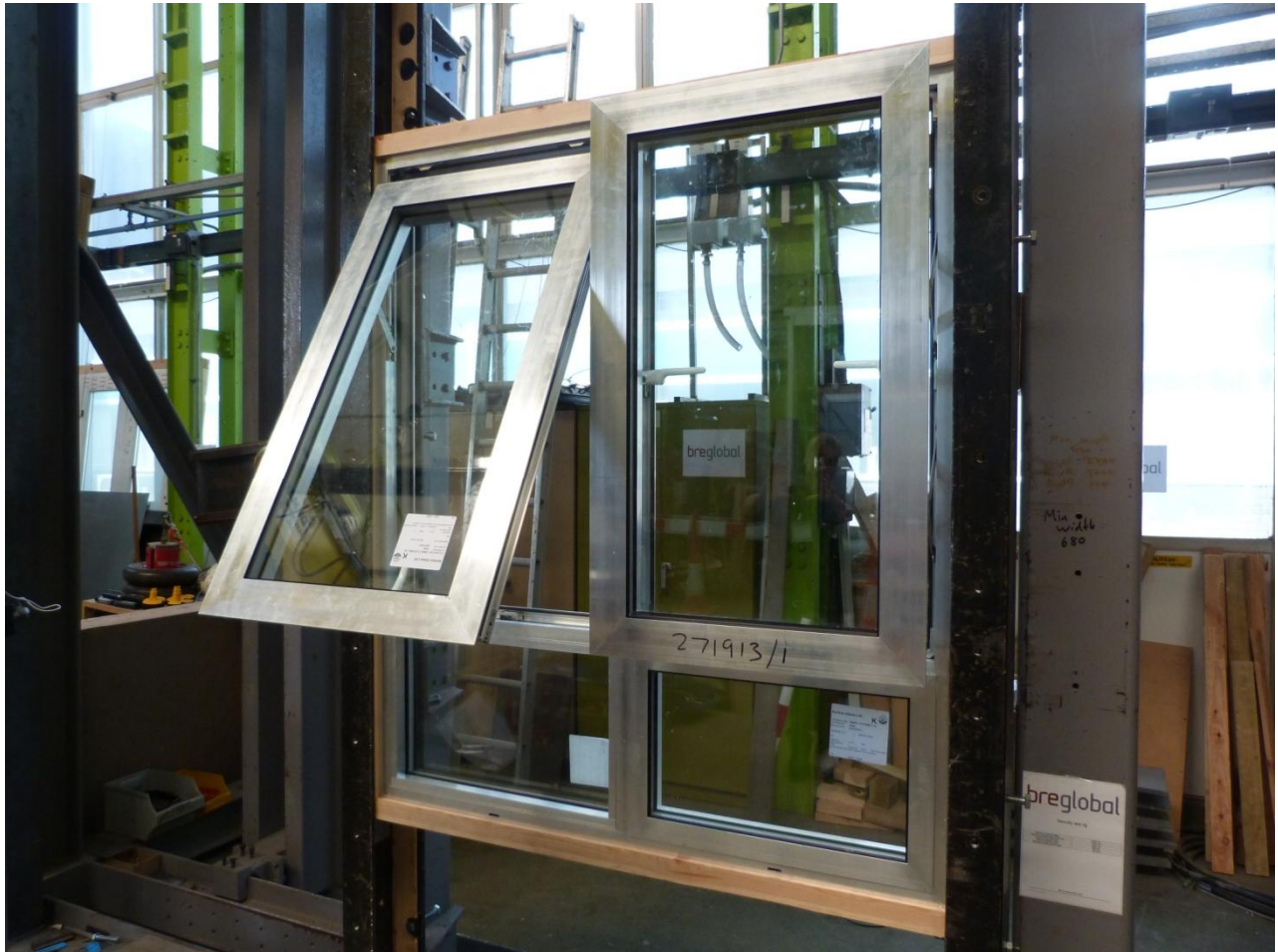


Figure 3 External face of outward opening windows with vents open



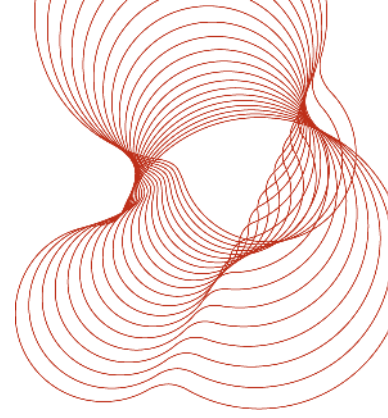


Figure 4 Friction stays and security claws on top hung sash



Figure 5 Scissor stays and keeps on parallel opening sash



Figure 6 Locking system keeps



Figure 7 Locking system



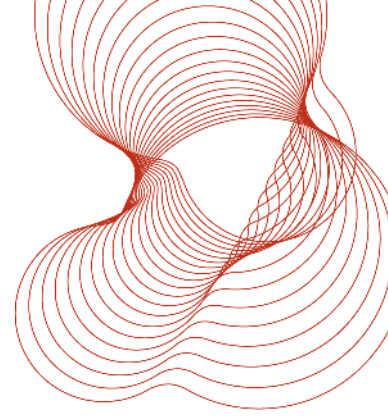


Figure 8 Externally glazed light viewed from attack side



Figure 9 Internally glazed light viewed from attack side

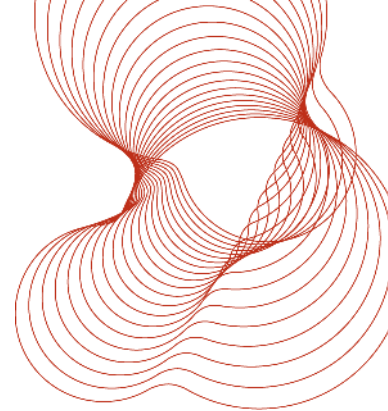


Figure 10 Externally glazed light viewed from non-attack side



Figure 11 Internally glazed light viewed from non-attack side





4 Test programme

The test methods were carried out in accordance with the procedures described in:

1. Clause 5.1 and Annex A of BS 7950:1997¹ where applicable*.
2. The BRE specific procedures Series F³.

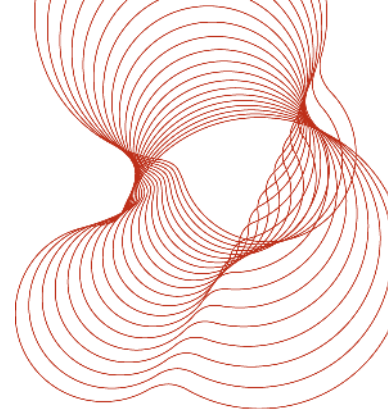
Parallel opening windows were outside the scope of BS7950:1997¹. The parallel opening windows were generally tested in accordance with the procedures defined above, the only deviation being that additional loading cases were used when testing the windows in accordance with the mechanical loading test (Clause A.6). The following additional loading cases were applied to the parallel opening window during the mechanical loading test[†]:

- Each corner was loaded as per loading case 3.
- Each scissor stay pivot was loaded as per loading case 8.

In order to carry out the tests the windows were fitted into the BRE Global Limited security test rig. Testing was conducted by Mr C Dunton and Mr P Mason of BRE Global Limited. At the start of the test, the temperature and humidity within the laboratory were 20.4°C and 56.7% RH respectively. For a period of one hour before and throughout the rest of the test programme the temperature and humidity of the laboratory was measured and found to be within the limits specified in Annex A.1 of BS 7950:1997¹.

* *Parallel opening windows were outside the scope of BS7950:1997¹ and therefore not covered by the scope of BRE Global Limited's UKAS accreditation.*

† *The preparation of this test schedule was not covered by the scope of BRE Global Limited's UKAS accreditation.*



5 Test results summary

A summary of each test result is given in Table 7.

Full details of the results for each test are given in Annex B.

Table 7 Results of BS 7950:1997¹ tests on the Smart Systems Limited top hung windows

Test	Test Method	Clause	Result	Observations/Comments
Specimen 271913/1				
1	Manipulation test	A.4	Pass	No entry achieved.
2	Manual glazing removal test	A.5.1	Pass	No entry achieved.
3	Manual check test	A.7	Pass	No entry achieved. No additional mechanical loading test required.
Specimen 271913/2				
4	Mechanical glazing removal	A.5.2	Pass	No entry achieved.
5	Mechanical loading test	A.6	Pass	No entry achieved.

Table 8 Results of BS 7950:1997¹ tests on the Smart Systems Limited parallel opening windows*

Test	Test Method	Clause	Result	Observations/Comments
Specimen 271913/1				
1	Manipulation test	A.4	Pass	No entry achieved.
2	Manual glazing removal test	A.5.1	Pass	No entry achieved.
3	Manual check test	A.7	Pass	No entry achieved. No additional mechanical loading test required.
Specimen 271913/2				
4	Mechanical glazing removal	A.5.2	Pass	No entry achieved.
5	Mechanical loading test	A.6	Pass	No entry achieved.

* Parallel opening windows were outside the scope of BS7950:1997¹ and therefore not covered by the scope of BRE Global Limited's UKAS accreditation. The parallel opening windows therefore were assessed using the methodology detailed in Section 4 of this report.

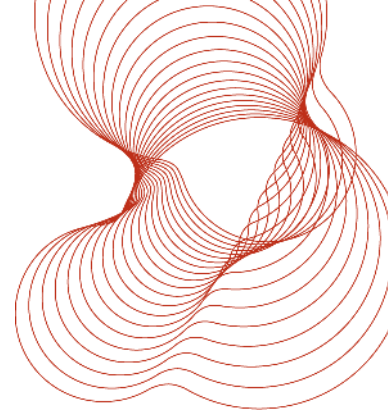
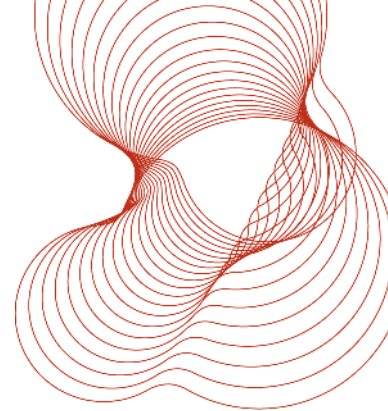


Table 9 Results of BS 7950:1997¹ tests on the Smart Systems Limited externally glazed fixed lights

Test	Test Method	Clause	Result	Observations/Comments
Specimen 271913/1				
2	Manual glazing removal test	A.5.1	Pass	No entry achieved.
Specimen 271913/2				
4	Mechanical glazing removal	A.5.2	Pass	No entry achieved.

Table 10 Results of BS 7950:1997¹ tests on the Smart Systems Limited internally glazed fixed lights

Test	Test Method	Clause	Result	Observations/Comments
Specimen 271913/1				
2	Manual glazing removal test	A.5.1	Pass	No entry achieved.
Specimen 271913/2				
4	Mechanical glazing removal	A.5.2	Pass	No entry achieved.



6 Conclusions

The 'Alitherm 700' top hung vent and fixed lights incorporated in the specimen submitted by Smart Systems Limited as detailed in Section 3, met the enhanced security performance requirements of BS 7950:1997¹.

The 'Alitherm 700' parallel opening vents^{*} submitted by Smart Systems Limited as detailed in Section 3 were tested to the principles of BS 7950:1997¹ using the methodology defined in Section 4[†]. As a result of those tests, entry was not achieved through the vent.

The results detailed in this report relate only to the specimens tested.

This report should not be used to convey or infer approval or certification of the product by BRE Global Limited unless it is supported by a valid certificate for the product issued by BRE Global Limited and is listed in the Red Book. Furthermore, this report should not be used to convey or infer conformity of products of alternative sizes and configurations without further testing or expert assessments, because such differences may affect the windows performance to the requirements of BS 7950:1997¹.

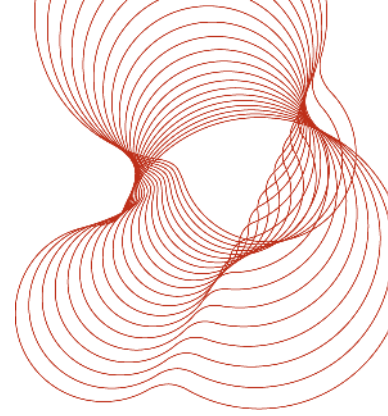
Copies of this report shall only be distributed in full without any abridgement or amendment.

7 References

1. BS 7950:1997 Incorporating Amendments Nos. 1, 2 and 3, *Specification for enhanced security performance of windows for domestic applications*. British Standards Institution.
2. PN145/6 *Standard terms and conditions of testing*. BRE Global Limited, 6 April 2008
3. BRE Specific procedures Series F. BRE Global Limited.

^{*} *Parallel opening windows were outside the scope of BS7950:1997¹ and therefore not covered by the scope of BRE Global Limited's UKAS accreditation.*

[†] *The preparation of that test schedule was not covered by the scope of BRE Global Limited's UKAS accreditation.*



Annex A - Documents supplied by Smart Systems Limited

Document Reference	Title	Date
CMD0237.1	Product Component Questionnaire Form	24 August 2011
Test 700/01	Alitherm 700	10 June 2011
-	Alitherm 700 parallel & casement system typical sectional details	August 2011

Testing of Smart Systems Limited's 'Alitherm 700' top hung and parallel opening windows and fixed lights windows to the requirements of BS 7950:1997

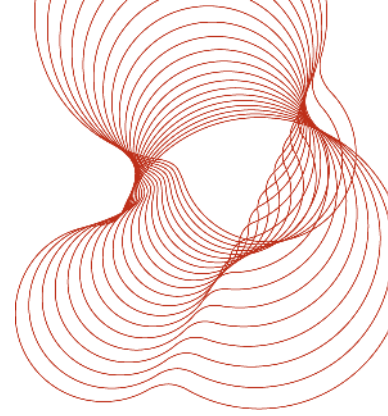
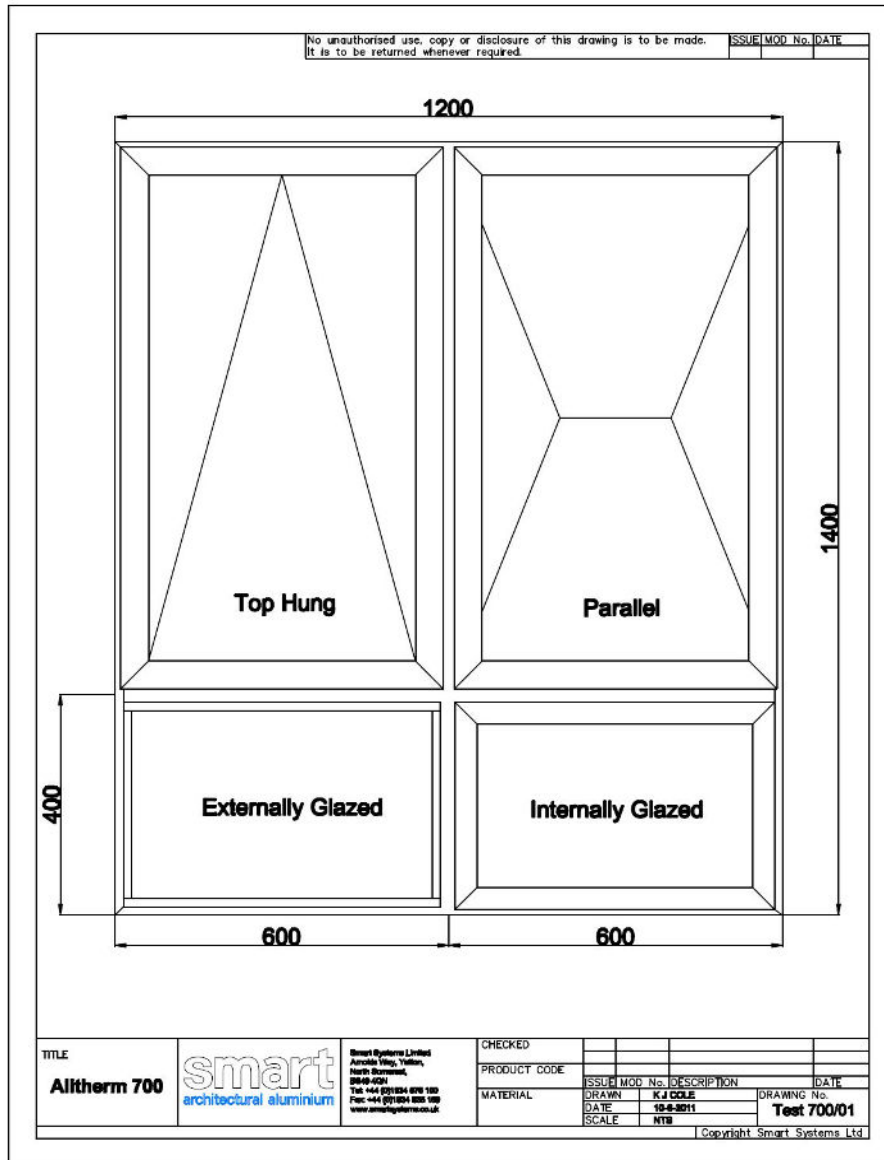


Figure 12 'Alitherm 700' drawing received from Smart Systems Limited



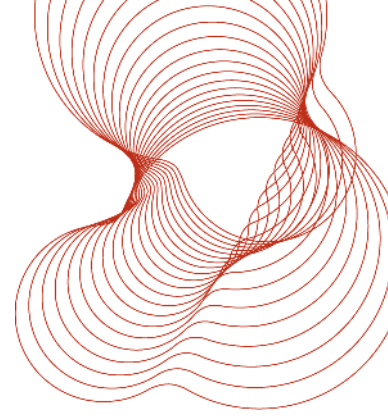
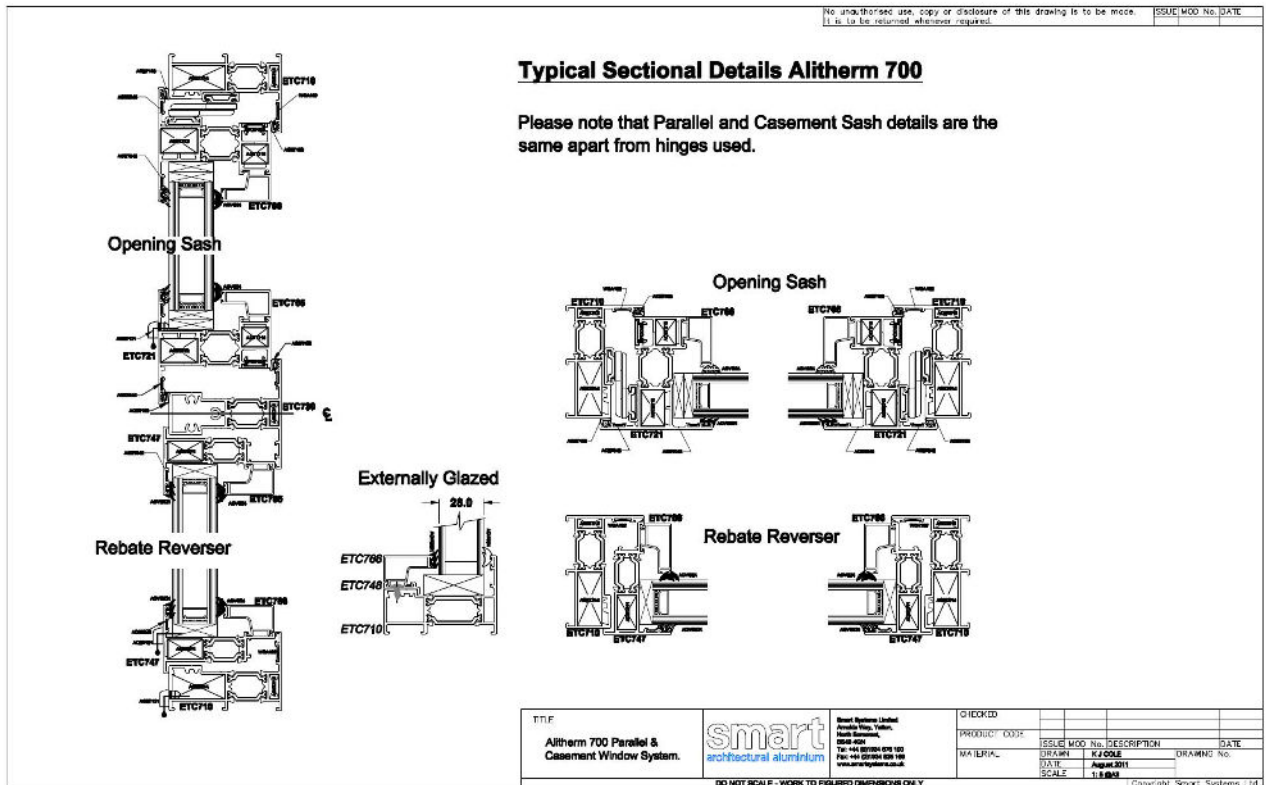
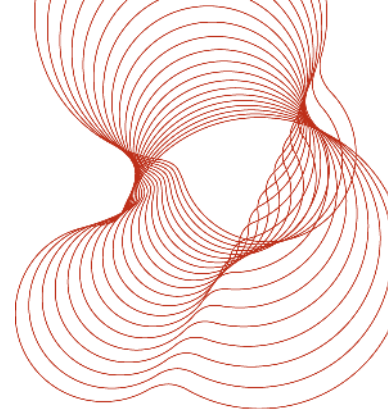


Figure 13 'Alitherm 700 parallel & casement system' typical sectional details received from Smart Systems Limited





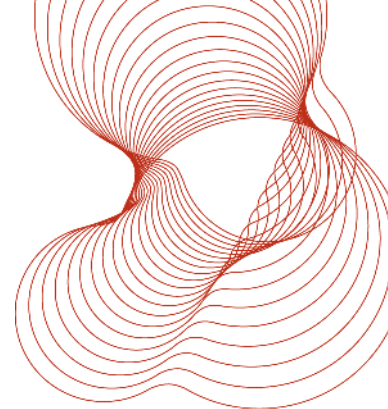
Annex B - Full test results

Clause A.4 - Manipulation test (Specimen 271913/1)

The test was conducted in accordance with the requirements of Clause A.4.

Test date: 11 July 2011

Attack Location	Tools	Overall Time (secs)	Observations
Top hung sash at corner locking point	Two paint scrapers, two small screwdrivers	180	Unable to access the lock. No entry achieved.
Top hung sash at central locking point	Two paint scrapers, two small screwdrivers	180	Unable to access the lock. No entry achieved.
Top hung sash at hinge	Two paint scrapers, two small screwdrivers	180	Unable to access the hinge. No entry achieved.
Parallel opening sash at corner locking point	Two paint scrapers, two small screwdrivers	180	Unable to access the lock. No entry achieved.
Parallel opening sash at central locking point	Two paint scrapers, two small screwdrivers	180	Unable to access the lock. No entry achieved.
Parallel opening sash at hinge	Two paint scrapers, two small screwdrivers	180	Unable to access the hinge. No entry achieved.
Test stopped	It was evident that entry would not be possible through the window using this test method with the tools available. No further locations were tested. No entry achieved.		

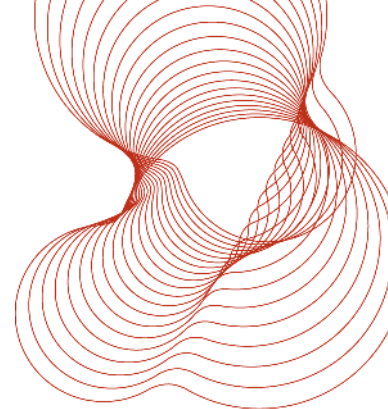


Clause A.5.1 – Manual glazing removal test (Specimen 271913/1)

The test was conducted in accordance with the requirements of Clause A.5.1.

Test date: 11 July 2011

Attack Location	Tools	Overall Time (secs)	Observations
Top hung sash	Craft knife, small screw driver, 6 mm screwdriver, 6 mm wood chisel, paint scraper	180	Profile surrounding the glazing deformed along a length of 60 mm. No entry achieved.
Parallel opening sash	Craft knife, small screw driver, 6 mm screwdriver, 6 mm wood chisel, paint scraper	180	Profile surrounding the glazing deformed along a length of 60 mm. No entry achieved.
Externally glazed fixed light. Between the glazing unit and the glazing unit frame.	Craft knife, small screw driver, 6 mm screwdriver, 6 mm wood chisel, paint scraper	180	Profile surrounding the glazing deformed along a length of 40 mm. No entry achieved.
Externally glazed fixed light. Between glazing unit frame and system frame.	6 mm screwdriver, 6 mm wood chisel, paint scraper	180	Glazing frame deformed along a length of 30 mm. No entry achieved.
Internally glazed fixed light	Small screwdriver, 6 mm screwdriver	180	Beading removed after 80 seconds. Unable to remove the glazing clips within the remaining time.



Clause A.7 - Manual check test (Specimen 271913/1)

The test was conducted in accordance with the requirements of Clause A.7.

Test date: 11 July 2011

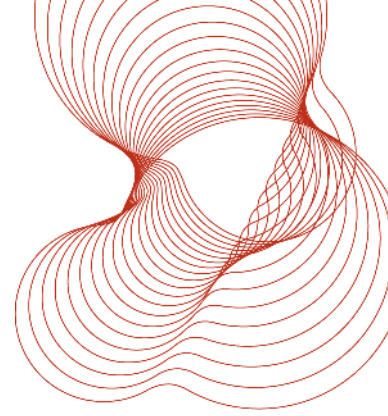
Attack Location	Tools	Overall Time (secs)	Observations
Side edge of top hung sash	Two nail bars	180	No entry achieved.
Top edge of top hung sash	Two nail bars	180	No entry achieved.
Bottom edge of parallel opening sash	Two nail bars	180	No entry achieved.
Test stopped	It was evident that entry through the window was unlikely to be achieved in the maximum allowed time of 15 minutes using the tools permitted by the standard. Therefore the manual check test was halted. No entry was achieved. No additional loading test was required.		

Clause A.5.2 – Mechanical glazing removal tests (Specimen 271913/2)

The test was conducted in accordance with the requirements of Clause A.5.2.

Test date: 11 July 2011

Location	Load (kN)	Observations
Externally glazed fixed light		
Top left corner of externally glazed fixed light	2	No damage. No entry achieved.
Bottom left corner externally glazed of fixed light	2	No damage. No entry achieved.
Top right corner of externally glazed fixed light	2	No damage. No entry achieved.
Bottom right corner externally glazed of fixed light	2	No damage. No entry achieved.
Internally glazed fixed light		
Top left corner of internally glazed fixed light	2	No damage. No entry achieved.
Bottom left corner internally glazed of fixed light	2	No damage. No entry achieved.
Top right corner of internally glazed fixed light	2	No damage. No entry achieved.



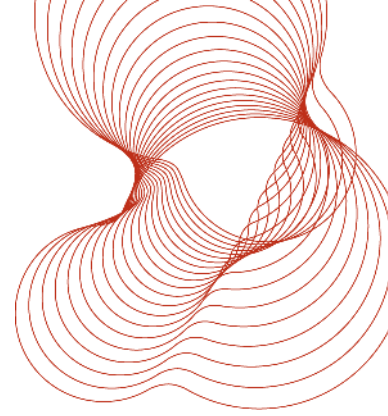
Location	Load (kN)	Observations
Bottom right corner internally glazed of fixed light	2	No damage. No entry achieved.
Top hung sash		
Top left corner of top hung sash	2	No damage. No entry achieved.
Bottom left corner of top hung sash	2	No damage. No entry achieved.
Top right corner of top hung sash	2	No damage. No entry achieved.
Bottom right corner of top hung sash	2	No damage. No entry achieved.
Parallel opening sash		
Top left corner of parallel opening sash	2	No damage. No entry achieved.
Bottom left corner of parallel opening sash	2	No damage. No entry achieved.
Top right corner of parallel opening sash	2	No damage. No entry achieved.
Bottom right corner of parallel opening sash	2	No damage. No entry achieved.

Clause A.6 - Mechanical loading test (Specimen 271913/2 – top hung sash)

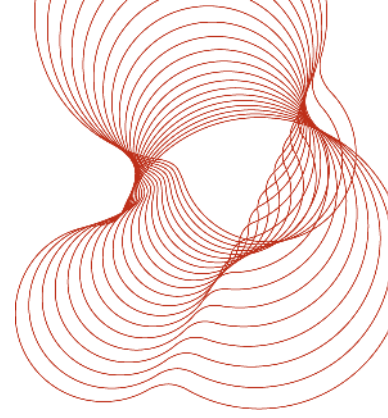
The test was conducted in accordance with the requirements of Clause A.6.

Test date: 11 July 2011

Location	Case (From Table B1 in BS 7950:1997 ¹)	Parallel To Plane Load	Perpendicular To Plane Load	Observations
Side hung sash hinge / security claw	1/5	At right angles to the edge (1 kN), then along the edge towards the opposite edge (1 kN).	3 kN	Load held.
Corner/cam	3/4	Along the edge in the direction to disengage the nearest locking point (1 kN), then at right angles to the edge towards the opposite edge from the nearest locking point (1 kN).	3 kN	Load held.
Deadbolt	4	Along the edge in the direction to disengage the bolt and at right angles to the edge (1 kN).	3 kN	Load held.



Location	Case (From Table B1 in BS 7950:1997¹)	Parallel To Plane Load	Perpendicular To Plane Load	Observations
Corner/cam	3/4	Along the edge in the direction to disengage the nearest locking point (1 kN), then at right angles to the edge towards the opposite edge from the nearest locking point (1 kN).	3 kN	Load held.
Side hung sash hinge / security claw	1/5	At right angles to the edge (1 kN), then along the edge towards the opposite edge (1 kN).	3 kN	Load held.

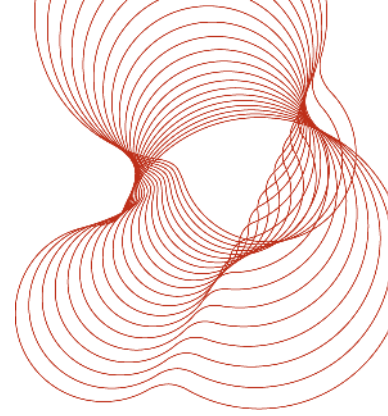


Clause A.6 - Mechanical loading test (Specimen 271913/2 – parallel opening sash)

The test was conducted in accordance with the requirements of Clause A.6 and the methodology given in section 4.

Test date: 11 July 2011

Location	Case (From Table B1 in BS 7950:1997¹)	Parallel To Plane Load	Perpendicular To Plane Load	Observations
Corner/cam	3/4	Along the edge in the direction to disengage the nearest locking point (1 kN), then at right angles to the edge towards the opposite edge from the nearest locking point (1 kN).	3 kN	Load held.
Pivot point	-	At right angles to the edge (1 kN).	3 kN	Load held.
Deadbolt	4	Along the edge in the direction to disengage the bolt and at right angles to the edge (1 kN).	3 kN	Load held.
Pivot point	-	At right angles to the edge (1 kN).	3 kN	Load held.
Corner/cam	3/4	Along the edge in the direction to disengage the nearest locking point (1 kN), then at right angles to the edge towards the opposite edge from the nearest locking point (1 kN).	3 kN	Load held.
Corner/cam	3/4	Along the edge in the direction to disengage the nearest locking point (1 kN), then at right angles to the edge towards the opposite edge from the nearest locking point (1 kN).	3 kN	Load held.
Pivot point	-	At right angles to the edge (1 kN).	3 kN	Load held.



Location	Case (From Table B1 in BS 7950:1997 ¹)	Parallel To Plane Load	Perpendicular To Plane Load	Observations
Deadbolt	4	Along the edge in the direction to disengage the bolt and at right angles to the edge (1 kN).	3 kN	Load held.
Pivot point	-	At right angles to the edge (1 kN).	3 kN	Load held.
Corner/cam	3/4	Along the edge in the direction to disengage the nearest locking point (1 kN), then at right angles to the edge towards the opposite edge from the nearest locking point (1 kN).	3 kN	Load held.
Pivot point	-	At right angles to the edge (1 kN).	3 kN	Load held.

=====REPORT ENDS=====