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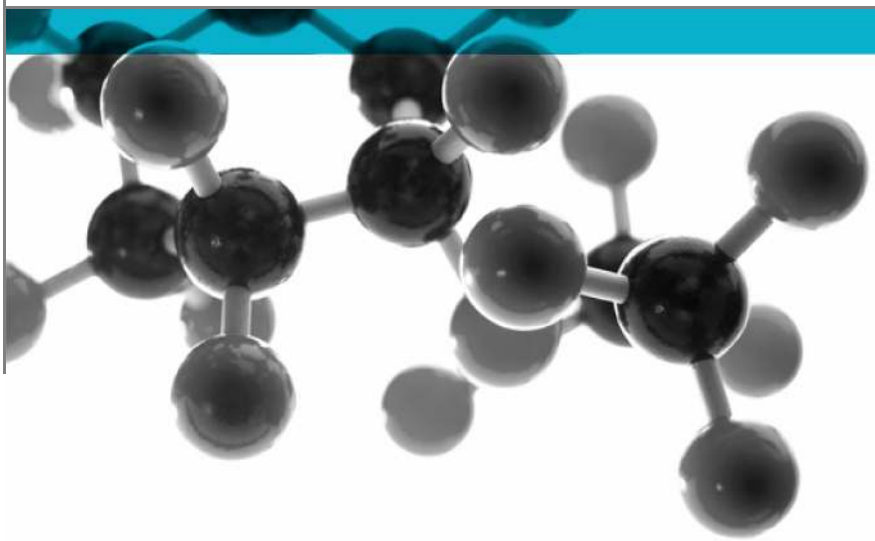
PAS 24:2016

Annex C



Test of: Arbor-Fenex 68f Alu Clad Timber Composite Tilt & Turn Window

Enhanced security performance requirements for windows

A Report To:
Selectron Elektrokimya Sanayi ve Ticaret Ltd Sti
Dereboyu Cd. Sengul Sk. No: 6 34303 Halkali / Istanbul Turkey

Document Reference:
WIL 382225

Date: 06/10/2017

Copy: 1

Issue No.: 1

Testing
Advising
Assuring

UKAS TESTING
0621

TEST CONCLUSIONS

Samples of:
Manufacturer Selectron Elektrokimya Sanayi ve Ticaret Ltd Sti
Product Window
Model Arbor-Fenex 68f Alu Clad Timber Composite Tilt & Turn Window

have been tested in accordance with: PAS24:2016 Annex C.
By Exova Willenhall, a UKAS accredited Testing Laboratory (No. 0621)

At Key Industrial Park, Fernside Rd, Willenhall, West Midlands, WV13 3YA.
Results and comments as detailed below:

Clause No.	Description	Compliance
4	**Enhanced security performance requirements**	**No**
4.1.1	Classification of use	No
4.2	Infill medium	No
4.3	Letterplates	N/A
4.4	Classification	W
5	**Marking**	**No**
6	**Design and general requirements**	**No**
Annex C	**Enhanced security performance for windows**	**Yes**
C.4.3	Manipulation test	Yes
C.4.4.2	Infill manual test	Yes
C.4.4.3	Infill mechanical test	Yes
C.4.5	Mechanical loading test	Yes
C.4.6	Manual check test	Yes
C.4.7	Additional mechanical loading test	N/A

No inferences can be made regarding performance against other requirements of this standard

Tests marked N/A are not applicable to the sample under test.
Tests marked N/T were not applied to the sample under test

AUTHORISATION

Tests performed by: Nick Steventon, Trainee Test Engineer

Report issued by: Nick Steventon, Trainee Test Engineer

Signed 

Date 6th October 2017

For and on behalf of Exova (UK) Ltd

Report authorised by: Mark West, Door & Window Laboratory Manager

Signed 

Date 6th October 2017

For and on behalf of Exova (UK) Ltd

Report issued: 06 October 2017

UKAS TESTING
0621

NOTE.
Tests marked “Not UKAS Accredited” are not covered by the Laboratory UKAS accreditation schedule.

The laboratory has tested the product supplied by the client as sampled in accordance with their own requirements

CONTENTS **PAGE NO.**

TEST DETAILS

CLIENT DETAILS

Company name	Selectron Elektrokimya Sanayi ve Ticaret Ltd Sti
Address	Dereboyu Cd. Sengul Sk. No: 6 34303 Halkali Istanbul Turkey
Contact	Hüseyin ÇALIŞKAN

ORDER DETAILS

Order number	F/A 170404
Dated	04/04/2017

SAMPLE DETAILS

Outer frame	1100 x 1600mm
Opening casements	1012 x 1512mm
Configuration	Single tilt before turn casement open-in
Material	Aluminium clad timber composite
Details of Hardware	
Hinge	Maco Tilt and turn hinges BS15 55443
Lock	Maco Multi espag lock 96561
Handles	Maco Rhapsody Handle 59501
Seals	Schlegel PE Liner, PU Foam, PP Plastic QL 3053, QL 3054

TEST DETAILS

Test specification	PAS 24:2016
Full test	Yes
Test to clauses	Annex C
Sample received	16/05/2017
Test started	17/05/2017
Test completed	17/05/2017
Special Test requirements	
Other reports to be used in conjunction with this report	

TEST PROCEDURE

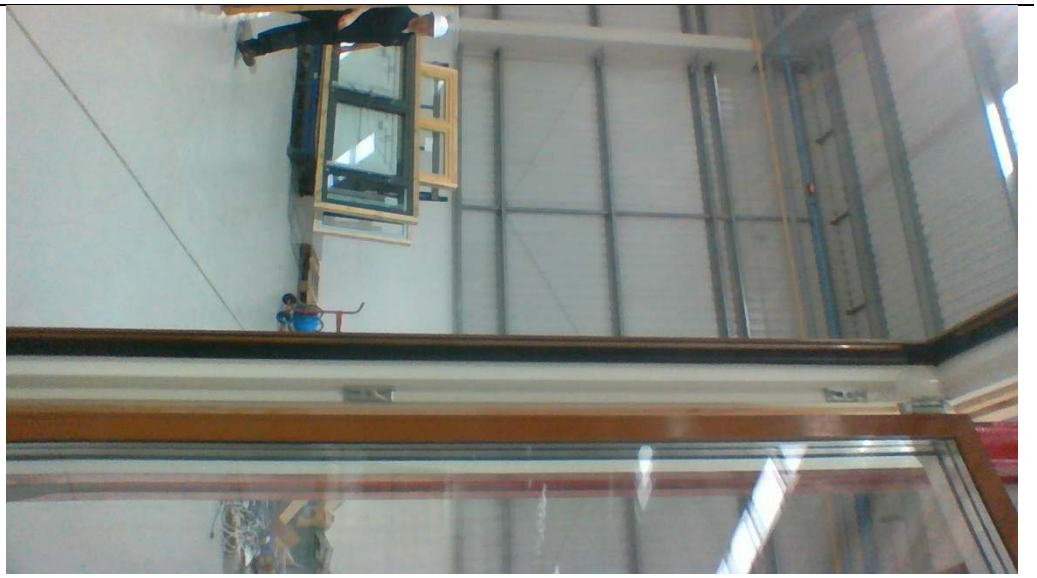
Introduction	This test report should be read in conjunction with the Standard PAS 24:2016 Enhanced security performance requirements for doorsets and windows in the UK. The specimens were judged on their ability to comply with the performance criteria as required in PAS24:2016 Annex C.
Instruction To Test	Initial requirement was for a classification of W for windows.
Test Specimen Construction	A description of the test construction is given in the Schedule of Components. The description is based on a detailed survey of the specimens and information supplied by the sponsor of the test.
Installation	The window was supplied mounted within a timber sub-frame of nominal section 75mm x 100mm fitted flush with the exterior face, in accordance with the clients fitting instructions.
Sampling	The samples were not independently witnessed or selected and were provided direct from the test sponsor.
Test Climate	The sample was conditioned in the laboratory in the range 15-30 °C and 25-75% humidity for at least 12 hours. The temperature and humidity in the lab was maintained in the range 19.8-20.6°C and 51.2-67.5% humidity for the duration of the test.

INITIAL OBSERVATIONS

The internal face of the sample

Sample locking hardware

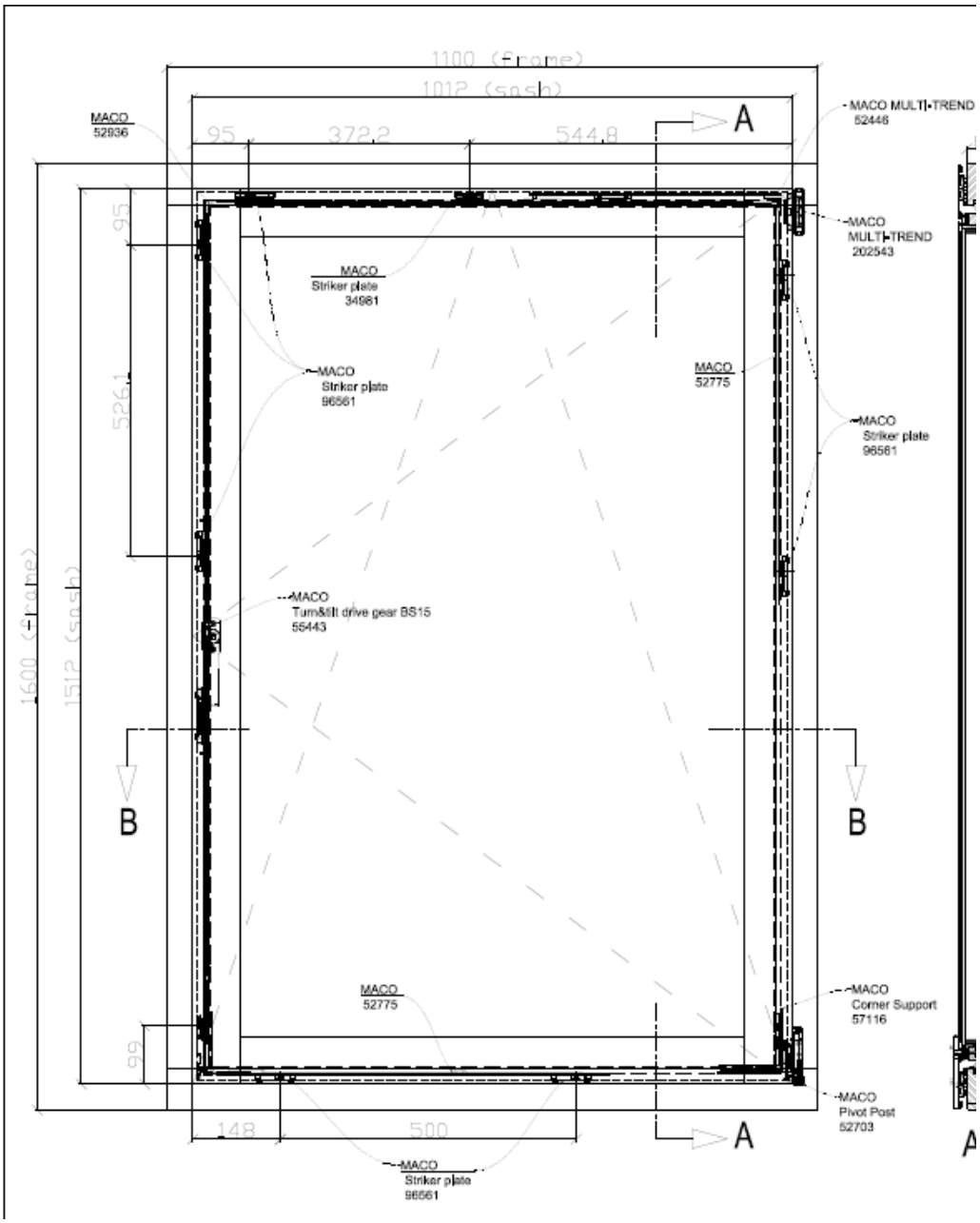
Sample hinge hardware



Sample handle

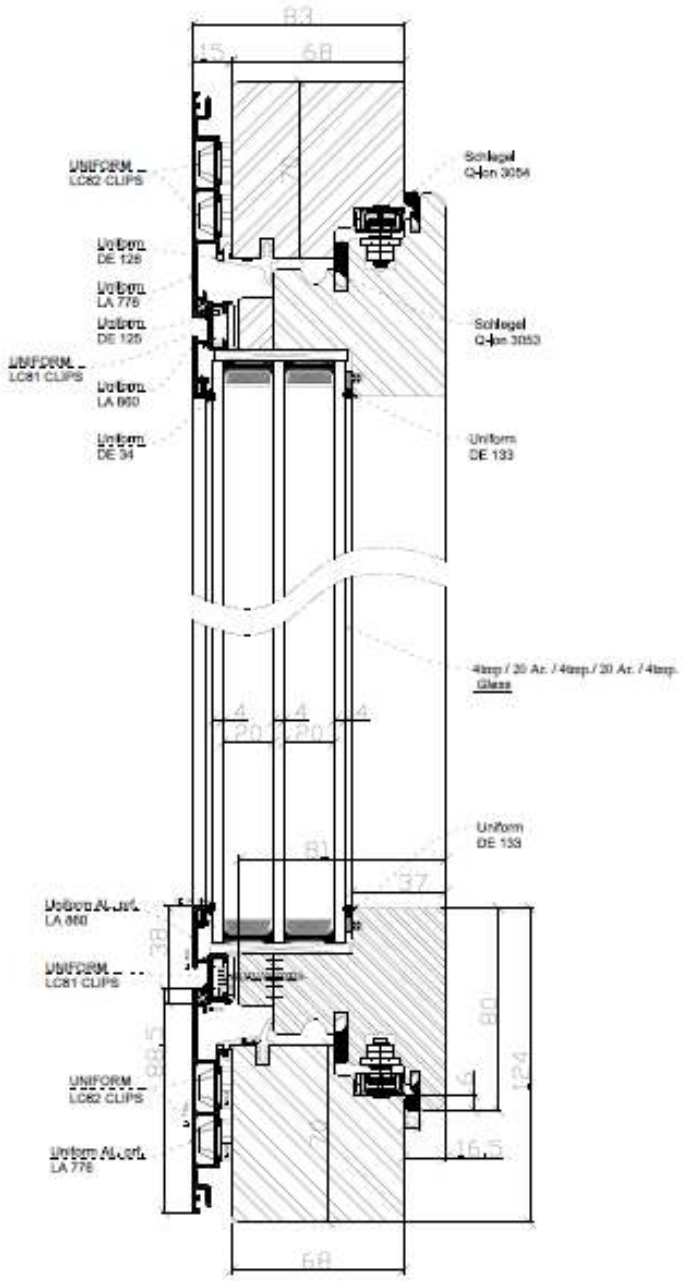
TEST SPECIMEN

Figure 1- General Elevation of Test Specimen (External Face)



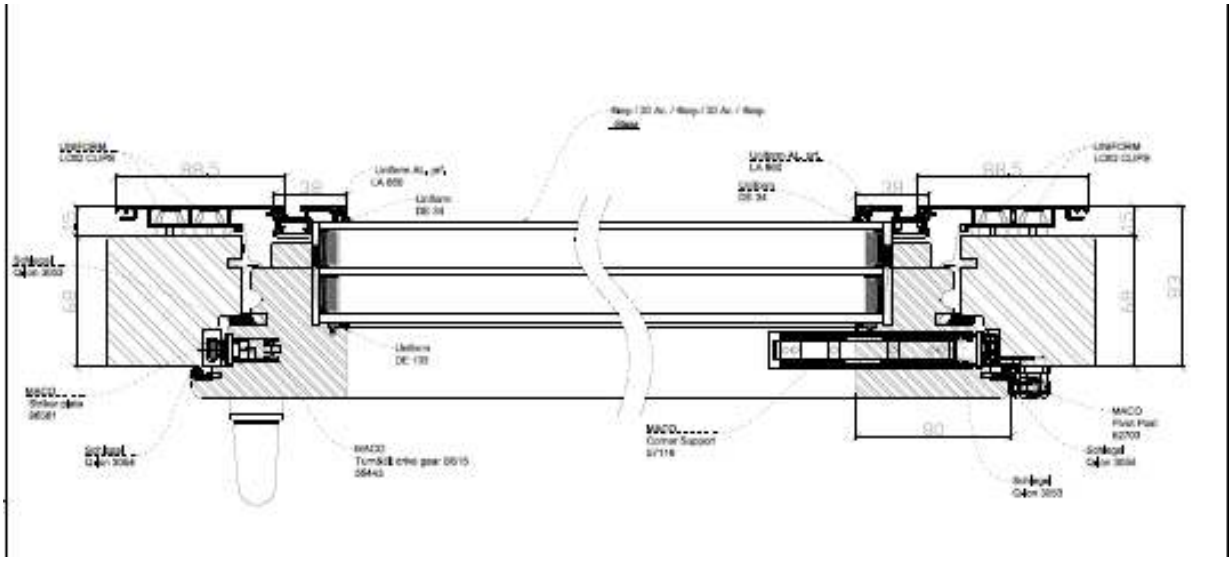
Do not scale. All dimensions are in mm

Figure 2 – Horizontal section



Do not scale. All dimensions are in mm

Figure 3 – Vertical section



Do not scale. All dimensions are in mm

SCHEDULE OF COMPONENTS

(Refer to Figures 1 to 3)
(All values are nominal unless stated otherwise)
(All other details are as stated by the sponsor)

Variants

None

Item		Description
1. Window frame head		
Supplier	:	Hecht & Kloth
Material	:	Wood / Pine
Density	:	450 kg/m^3 (stated)
Glazing / casement rebate size	:	18mm
Section size	:	70 x 68mm
Fixing jamb to head joints	:	Finger Joint / Conduit
Details of adhesive		
i. supplier	:	Soudal
ii. reference	:	D4105333
2. Window frame jamb		
Supplier	:	Hecht & Kloth
Material	:	Wood / Pine
Density	:	450 kg/m^3 (stated)
Glazing / casement rebate size	:	18mm
Section size	:	70 x 68 mm
Fixing jamb to sill joints	:	Finger Joint / Conduit
Details of adhesive		
i. supplier	:	Soudal
ii. reference	:	D4105333
3. Window frame sill		
Supplier	:	Hecht & Kloth
Material	:	Wood / Pine
Density	:	450 kg/m^3 (stated)
Glazing / casement rebate size	:	18mm
Section size	:	70 x 68mm
4. Window frame weather seals		
Supplier	:	Schlegel (Germany)
Reference	:	QL 3053, QL 3054
Material	:	PE Liner, PU Foam, PP Plastic
Fixing method	:	Put into the seal groove

Item		Description
5. Window frame cladding		
Supplier	:	Uniform (Italy)
Profile code	:	LA 776
Material	:	Aluminium
Grade	:	6063 T6
Gauge / wall thickness	:	1.7mm
Section size	:	
Fixing cladding to frame		Clips (Clip fitted onto face of timber)
i. type	:	Screw
ii. size	:	16 x 18 x 13mm
iii. quantity	:	46
6. Window casement (s)		
Overall Size		1100 x 1600 mm
Supplier	:	FENEX / ARBOR
Profile codes		
i. stile profile code	:	68f-s
ii. rail profile code	:	68f-r
Material	:	Scottish Pine
Density	:	450 kg/m^3 (stated)
Glazing rebate size	:	18mm
Casement framing section size	:	68 x 70mm
Glazing rebate	:	18mm
Corner fixing method	:	Finger Joint / Conduit
Details of adhesive		
Details of adhesive		
i. supplier	:	Soudal
ii. reference	:	D4105333
7. Window casement glass		
Supplier	:	YILDIZ CAM
Thickness / configuration	:	52mm - Configuration 4mm Toughened /20 /4mm Clear / 20 /4 mm Toughened Argon, Aluminium Spacer
Overall size	:	880 x 1380 mm
Nominal edge clearance	:	4mm
8. Glazing setting blocks		
Supplier	:	Hecht & Kloth (Germany)
Material	:	Wood /Pine
Thickness	:	4mm
Section size	:	54 x 60 mm
9. Glazing tape (internal face)		
Supplier	:	Uniform (Italy)
Reference	:	DE 133
Material	:	EPDM
Thickness	:	3mm
Section size	:	8x11 mm
Fixing method	:	Put into the seal groove.

Item		Description
10. Glazing tape (external face)		
Supplier	:	Uniform (Italy)
Reference	:	DE 34
Material	:	EPDM
Thickness	:	3 mm
Section size	:	9x9 mm
Fixing method	:	Put into the seal groove.
11. Glazing beads		
Glazing method	:	Uniform (Italy) LA 860
Material	:	Aluminium Cladding
Fixing method		
i. type	:	Screw
ii. size	:	3.5 x 25 mm
iii. centres	:	200 mm
12. Window casement cladding		
Supplier	:	Uniform (Italy)
Profile code	:	LA776 & LA 860
Material	:	Aluminium Profile
Gauge / wall thickness	:	1.7mm
Section size	:	15 x 38mm
Fixing cladding to casement		Clips
i. type	:	LC81 Turning
ii. size	:	17 x 52 x 11 mm
iii. quantity	:	24
13. Glazing security clips		
Supplier	:	Uniform (Italy)
Description	:	LC 81, LC 62
Reference	:	LA 776, LA 860
Material	:	Aluminium Profile
Position	:	80 mm from corners and at 100 mm (Frame) 200mm (Sash) centres
Fixings		Clips fitted onto face of timber
i. type	:	Screw
ii. size	:	3.5 x 25 mm
iii. quantity	:	1
14. Tilt and turn hardware		
Supplier	:	MACO (Austria)
Description	:	Turn & Tilt drive gear BS15 55443
Reference	:	BS15 55443
Material	:	Steel
Fixing hardware to casement		
i. type	:	Screw
ii. size	:	3.5 x 35 mm
iii. quantity	:	10

Item		Description
Fixing hardware to frame		
i. type	:	Screw
ii. size	:	3.5 x 35 mm
iii. quantity	:	10

15. Lock Keeps

Supplier	:	MACO (Austria)
Description	:	MACO Striker plate
Reference	:	96561
Quantity	:	7 pieces
Fixing keeps to frame		
i. Type	:	Screw
ii. Size	:	3,5x35
iii. Quantity	:	2

16. Lever handles

Supplier	:	MACO (Austria)
Description	:	MACO Rhapsody Handle
Reference	:	59501
Fixings		
i. Type	:	Machine Screws
ii. size	:	M5 x 40mm
iii. quantity	:	2

PERFORMANCE CRITERIA & TEST RESULTS

Clause	Result		Compliance
4.1.1 Classification of use	Windows shall be classified according to their intended use for all relevant characteristics in accordance with BS 6375 and the relevant material specific standard.	No evidence supplied by client for BS6375-1. Report WIL 382224 supplied for BS6375-2.	**NO**
4.1.3 Windows	Windows must meet the requirements of Annex C of PAS24:2016 or RC2N of BS EN 1627	Window meets the requirements of Annex C of PAS24.	**YES**
4.2 Infill medium requirements	Where non-key locking hardware is fitted each glazed area shall include at least one pane of laminated glass meeting the requirements of BS EN 356:2000 Class P1A.	No evidence supplied by client	**NO**
4.3 Letterplates	Window not fitted with a letterplate, not applicable.		**N/A**
4.4 Classification	Following testing to Annex C the final classification shall be determined as W for a window.	Window classified as W for windows.	**NOT CLASSIFIED**
5 Marking	Window assembly shall be permanently marked, in a position that is visible and accessible when the window is open, with the following information: • The number and date of the specification and the classification, i.e. PAS24:2016 W. • The date of manufacture (at least year and quarter) • The name or trade mark or other means of identifying the manufacturer	Pre-certification prototype only. No labels supplied as yet. Customer advised of labelling requirements for production windows.	**NO**

Clause	Result		Compliance
6.2 Installation instructions	The manufacturer shall supply full instructions for assembly, installation and maintenance	Pre-certification prototype only. No installation instructions supplied as yet. Customer advised of installation instruction requirements for production windows.	**NO**

Clause	Result	Pass / Fail
Annex C: Enhanced security performance requirements for windows		
C.4.3 Manipulation test	Attacks were made using a paint scraper to try and manipulate the locking point. Total attack time was 3 minutes but the locking point could not be disengaged. Entry not achieved. Attacks were made using a screwdriver to try and manipulate the locking point. Total attack time was 3 minutes but the locking point could not be disengaged. Entry not achieved. Attacks were made using a craft knife to try and cut the hinge point out. Total attack time was 3 minutes but the hinge could not be fully cut out. Entry not achieved.	**Pass W**
C.4.4.2 Manual test on infill	Attacks were made with the craft knife, 6mm and 25mm chisels to try and remove the beading and try to lever out the glazing. Total attack time was 3 minutes but the beading could not be removed. Entry not achieved.	**Pass W**
C.4.4.3 Mechanical test on infill	2.0kN loads were applied to the top left, top right, bottom right and bottom left corners of the glazing. All loads were held and no entry was achieved	**Pass W**
C.4.5 Mechanical loading test	Attempts to apply Mechanical loads to all the hinge points and locking points were made with the following results obtained. **Point 1: Top hinge** 1kN parallel load (down) and 3kN perpendicular load held for 10s. 1kN parallel load (horizontal) and 3kN perpendicular load held for 10s. **Point 2: 1st locking cams** 1kN parallel load (horizontal) and 3kN perpendicular load held for 10s. 1kN parallel load (down) and 3kN perpendicular load held for 10s. **Point 3: 2nd locking cams/free corner of casement** 1kN parallel load (horizontal) and 3kN perpendicular load held for 10s. 1kN parallel load (down) and 3kN perpendicular load held for 10s. **Point 4: 3rd locking cams** 1kN parallel load (down) and 3kN perpendicular load held for 10s. 1kN parallel load (horizontal) and 3kN perpendicular load held for 10s. **Point 5: 4th locking cams/free corner of casement** 1kN parallel load (down) and 3kN perpendicular load held for 10s 1kN parallel load (up) and 3kN perpendicular load held for 10s. 1kN parallel load (horizontal) and 3kN perpendicular load held for 10s. **Point 6: 5th locking cams**	**Pass W**

Clause	Result	Pass / Fail
	1kN parallel load (horizontal) and 3kN perpendicular load held for 10s. 1kN parallel load (up) and 3kN perpendicular load held for 10s. **Point 7: Bottom hinge** 1kN parallel load (upwards) and 3kN perpendicular load held for 10s. 1kN parallel load (horizontal) and 3kN perpendicular load held for 10s **Point 8: 6th locking cams** 1kN parallel load (up) and 3kN perpendicular load held for 10s. 1kN parallel load (horizontal) and 3kN perpendicular load held for 10s. All loads were held and no entry was achieved.	
C.4.6 Manual check test	Attacks were made with the screwdriver and nail bar to try and lever the sash away from the frame and gain entry. Total attack time was 3 minutes. Entry not achieved. Attacks were made with the screwdriver and nail bar to try and lever the sash away from the frame and gain entry. Total attack time was 3 minutes. Entry not achieved Attacks were made with the screwdriver and nail bar to try and lever the sash away from the frame and gain entry. Total attack time was 3 minutes. Entry not achieved	**Pass** **NO VULNER-ABILITY IDENTIFIED**
C.4.7 Additional mechanical loading test	Testing was not required as no vulnerabilities were identified in the manual check test.	**NOT REQUIRED**

CONCLUSIONS

Evaluation against objective	The windows as provided by the client were subjected to enhanced security testing in accordance with PAS24:2016 Annex C and achieved the requirements for a classification of W for windows.
Observations & comments	

LIMITATIONS

Limitations	The results relate only to the behaviour of the specimens of the element of construction under the particular conditions of test. They are not intended to be the sole criteria for assessing the potential performance of the element in use, nor do they reflect the actual behaviour in use.
Range of assemblies covered by this report	It is our opinion that the range of assemblies covered by this report are limited to the following ▪ Assemblies with identical hardware fitted no further apart than in the tested assembly ▪ Assemblies of the same or smaller overall dimensions to the tested assembly
Uncertainty of Measurement	The uncertainties of measurements calculated for a confidence level of 95% throughout these tests are within the limits of these tolerances.

REVISION HISTORY

Issue No :	**Re - Issue Date :**
Revised By:	**Approved By:**
Reason for Revision:	
Issue No :	**Re - Issue Date :**
Revised By:	**Approved By:**
Reason for Revision:	

END OF REPORT