



Test Report No: WTH2403#2-1 Rev 1

Date: 13/05/2024

Testing of: Side hung by side hung casement window

Tested to: PAS 24 : 2022

Prepared for: Nico Manufacturing Ltd

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AUTHORISATION

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Report produced by: D.Kury Position: Senior Test Engineer

Signature: 

Date: 19/09/2024

For and on behalf of Nico Manufacturing Ltd Test Laboratory

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Signature: 

Date: 19/09/2024

For and on behalf of Nico Manufacturing Ltd Test Laboratory

Date of issue of report 19/09/2024

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TEST REQUESTED BY

Origin of test request

Company Name	Nico Manufacturing Ltd
Company Address	Oxford Road Clacton on Sea Essex CO15 3TJ
Contact	Ian Harrison
Contact position	Sales & Marketing Director

Quotation Details

Quotation No.	WTH2403
Dated:	23/01/2024□

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DETAILS OF TEST

Description	Projecting casement window
Model / type	Side hung next to side hung
Make / Brand	Eurocell modus
Any special requirements	

Test Specification	PAS24:2022 Enhanced security performance requirements for doorsets and windows in the UK
Date sample received	07/03/2024
Date testing started	13/05/2024
Date testing finished	04/06/2024
Job No.	WTH2403
Any special requirements	

C.4.3 Manipulation test. - Shall be conducted prior to the infill medium removal test. Maximum overall attack time shall be 15 minutes although no single technique shall be used for more than than 3 minutes. The total rest time which is taken between techniques is unlimited for this test. If fixings are exposed, repeat the manipulation test after the additional mechanical loading test. If the additional mechanical loading test is not required and the fixings are exposed, repeat the manipulation test after the mechanical loading test. The overall attack time shall be 3 minutes with the primary intention of releasing fasteners exposed as a result of the mechanical load tests.

Using the limitations in A.2 and the tools listed in A.2.2 and where applicable A.2.3.3, A.2.3.5, A.2.3.6 and A.2.3.7 attempt various methods of manipulation such as: removal of trim sections, removal of any hinge pin, insertion of a tool to disengage locking devices, undoing/manipulation of fasteners in accessible hardware and applying a physical force by hand to dislodge locking devices.

C.4.4.2 Infill medium removal test, Manual. - Using a variety of tools as detailed in Annex A of PAS24:2022 attempts are made to remove gaskets, beads, security devices and then infill medium from the exterior face of the glazing system. Test duration is 3 minutes.

C.4.4.3 Infill medium removal test, Mechanical. - A load of 2000N is applied to each corner of the infill medium in turn via a plywood block 150mm x 150mm (±5mm) of 25mm thickness and each load is held for 10 seconds. If failure is exhibited at the corners loading is continued along each section in an attempt to deglaze the window.

C.4.5 Mechanical loading test. - Loading consists of the application of a 1000N parallel to plane load which is held until a 3000N perpendicular to plane load has been applied and removed. Loads are applied to each corner and at each locking and hinge point of each opening sash. Loading cases (table C.1) and sequence of loading (figure C.14) are shown in PAS 24:2022.

C.4.6 Manual check test. - Using the tools specified in PAS 24:2022 B.4.6.2 attempts are made to gain entry by levering at any location and in any direction such that the combined location and direction of the force applied does not replicated the standard mechanical loading cases. If entry is gained the new location and the direction of applied loads shall be noted and an additional mechanical loading test shall be performed.

Test duration 15 minutes with no single technique being used for more than 3 minutes

C.4.7 Additional mechanical loading test. - Carry out load test in accordance with C.4.5 using the loading configuration defined in C.4.6.

The samples were mounted in timber sub frames (nominal 100mm x 50mm in section).
The samples were mounted in the test rig without any twists or bends that might influence the test result.

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DETAILS OF SAMPLE

Sample number	WTH2403A
Sample details	Side hung next to side hung casement window
Fabricator	Quantum Windows Ltd
Material:	PVC-U, Eurocell Modus profile Eurocell part numbers; Frame - LSF1021W, Sash - LSF1005W, Transom/Mullion - LSF1002W, Transom/Mullion reinforcement - EWS801P
Finish	Gloss White
Lock & keeps	Lock - Nico PAS Espag, part no 9291422 Keeps - Nico PAS Espag Keep, part no 9205L/R
Hinges & protectors	Hinges (large sash) - Nico 17mm Atlas Quad, part no 8471L and Nico 17mm stack 14" Atlas, part no 8571R. Hinges (Small sash) - 16" Standard, part no 8240L and 16" Standard Restrictor, part no 8340R. Hinge protectors - Nico Xtra bolt, part no 8100
Handle	Fab & Fix inline white
Fixings	Lock - 4.3 x 25mm c'sk head pierce point Keeps - 4.3 x 25mm c'sk head pierce point Hinges - 4.3 x 30mm c'sk head pierce point to sash, 4.2 x 21mm pan head pierce point to frame Hinge protectors - 4.3 x 30mm c'sk head pierce point Weather interlock wedges - 4.3 x 25mm c'sk head pierce point
Weather sealing	Co extruded gaskets Interlocking wedges, part no EWS7201W
Glass (or infill)	4-20-4mm clear toughened double glazed units
Glazing system	Co extruded gaskets Internally bead glazed - LSF1301W
Sample dimensions	1470mm (h) x 1678mm (w), mullion 739mm
Additional information	Clip in leading ramp - LSF1202W

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DETAILS OF SAMPLE

Sample number	WTH2403B
Sample details	Side hung next to side hung casement window
Fabricator	Quantum Windows Ltd
Material:	PVC-U, Eurocell Modus profile Eurocell part numbers; Frame - LSF1021W, Sash - LSF1005W, Transom/Mullion - LSF1002W, Transom/Mullion reinforcement - EWS801P
Finish	Gloss White
Lock & keeps	Lock - Nico PAS Espag, part no 9291422 Keeps - Nico PAS Espag Keep, part no 9205L/R
Hinges & protectors	Hinges - Nico 17mm Atlas Quad on small sash, part no 8471L and Nico 17mm stack 14" Atlas for other 3 hinges, part no 8571L/R Hinge protectors - Nico Xtra bolt part no 8100
Handle	Fab & Fix inline white
Fixings	Lock - 4.3 x 25mm c'sk head pierce point Keeps - 4.3 x 25mm c'sk head pierce point Hinges - 4.3 x 30mm c'sk head pierce point to sash, 4.2 x 21mm pan head pierce point to frame Hinge protectors - 4.3 x 30mm c'sk head pierce point Weather interlock wedges - 4.3 x 25mm c'sk head pierce point
Weather sealing	Co extruded gaskets Interlocking wedges, part no EWS7201W
Glass (or infill)	4-16-4-16-4mm clear toughened triple glazed units
Glazing system	Co extruded gaskets Internally bead glazed - LSF1302W
Sample dimensions	1470mm (h) x 1678mm (w), mullion 939mm
Additional information	Clip in leading ramp - LSF1202W

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CONCLUSIONS OF TEST

Clause No.	Test Description	Test result
C.4.3	Manipulation test prior to infill removal test	Pass
C.4.3	Manipulation test if fixings are exposed after mechanical loading test or additional mechanical loading test	Pass
C.4.4.2	Infill removal test - manual	Pass
C.4.4.3	Infill removal test - mechanical	Pass
C.4.5	Mechanical loading test	Pass
C.4.6	Manual check test	No entry gained
C.4.7	Additional mechanical loading test	N/A

Classification (As per clause 4.4)	W
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The results contained in this report apply only to the samples tested as received and to the specific tests carried out within this report.

Test specimen details

Details of the samples construction and hardware components is based on information supplied by the test client, while these details have been checked and verified where possible WTH accepts no responsibility for the accuracy of details supplied.

Test Specimen setup

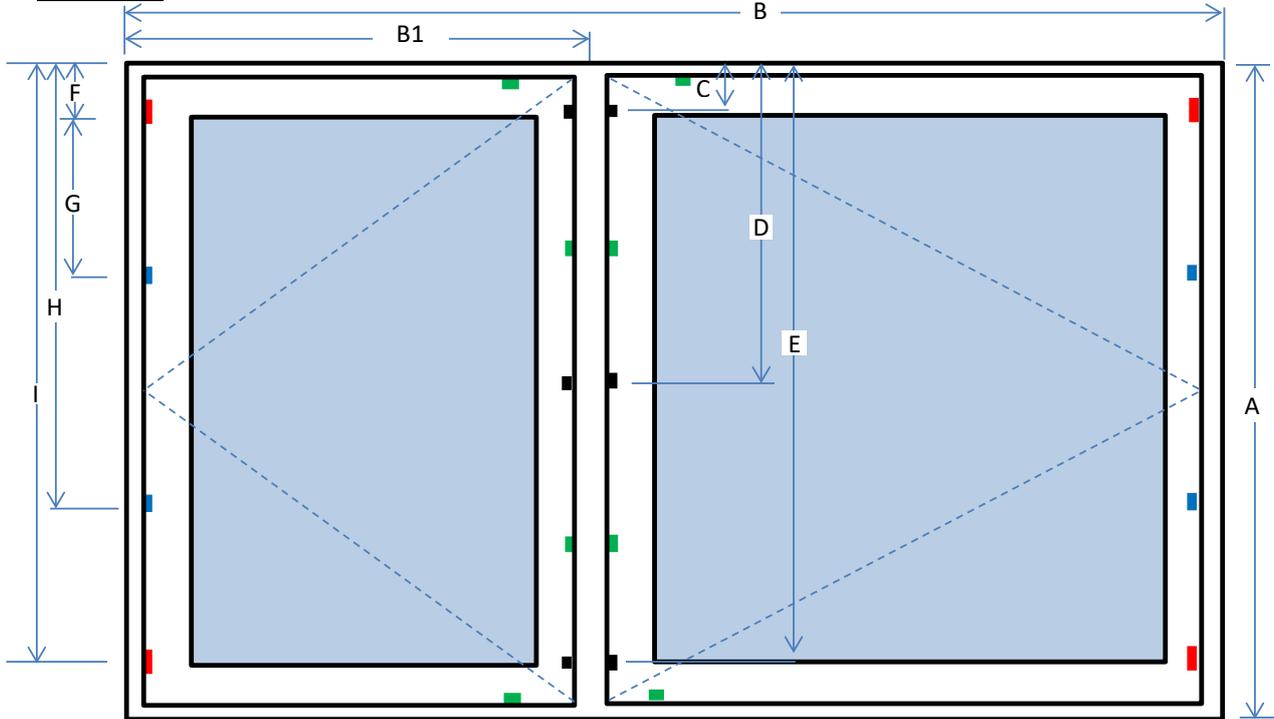
The test specimen was mounted at a height of ???mm from the working floor level to the underside of the sill or sub-sill.

Note : The test specimens were kept in the test laboratory for a minimum of 12 hours at environmental conditions of between 15°C to 30°C, and 25% to 75% RH before each test was undertaken as specified in PAS 24:2022 Clause C.4.1



TEST WINDOW DRAWING

WTH2403A



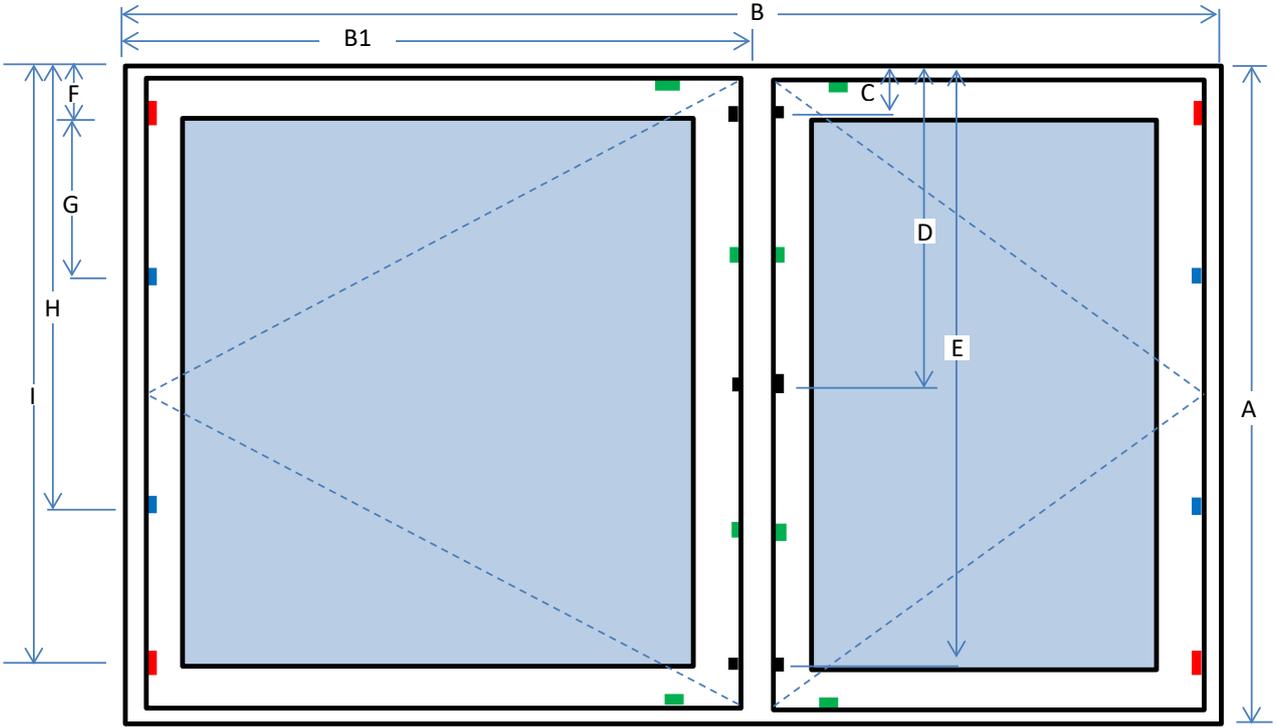
- █ Hinge protectors
- █ Riser block
- █ Pull in wedge
- Lock point

A	=	1470	mm
B	=	1678	mm
B1	=	739	mm
C	=	95	mm
D	=	730	mm
E	=	1360	mm
F	=	90	mm
G	=	405	mm
H	=	975	mm
I	=	1380	mm



TEST WINDOW DRAWING

WTH2403B



- Hinge protectors
- Riser block
- Pull in wedge
- Lock point

A	=	1470	mm
B	=	1678	mm
B1	=	939	mm
C	=	95	mm
D	=	730	mm
E	=	1365	mm
F	=	95	mm
G	=	395	mm
H	=	975	mm
I	=	1370	mm

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MANIPULATION TEST

Sample No	Temperature	Measured Humidity	Adjusted humidity	Date
WTH2403A	21.1 °C	63.1 %RH	63.1 %RH	17/05/2024

Clause 4.3 Manipulation test prior to infill removal test. (Maximum overall time limit 15 minutes)

Cross point screwdriver used to reach and loosen hinge screws on at left sash bottom L/H lock point - No entry gained
 Paint scraper used to lever right sash at R/H lock point, Cross point screwdriver used to reach and loosen hinge screws - No entry gained
 Craft knife used to cut away left sash profile adjacent to R/H lock point - no entry gained
 Paint scraper used to lever left sash at R/H lock point. Wire used to disengage cam from keep - No entry gained

As no further potentially vulnerable attack points could be identified, the test was halted.

INFILL MEDIUM REMOVAL TEST

Sample No	Temperature	Measured Humidity	Adjusted humidity	Date
WTH2403A	21.7 °C	62.9 %RH	62.9 %RH	17/05/2024

Clause 4.4.2 Infill manual test

Craft knife used to cut vee notch in sash profile, 6mm chisel used to remove upstand in glazing rebate - No entry gained

MANUAL CHECK TEST

Sample No	Temperature	Measured Humidity	Adjusted humidity	Date
WTH2403A	22 °C	62.1 %RH	62.0 %RH	17/05/2024

Clause 4.6 Manual check test (note tools used and time taken)

2 off nail bars used to lever at mid point hinge side of left sash - No entry gained
 2 off nail bars used to lever right sash mid way between L/H and centre lock points - No entry gained
 Nailbar and screwdriver used to lever and wedge at mid point hinge side of sash - No entry gained
 2 off nail bars used to lever right sash mid way between L/H and R/H lock points - No entry gained

As no further potentially vulnerable attack points could be identified, the test was halted

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MANIPULATION TEST

Sample No	Temperature	Measured Humidity	Adjusted humidity	Date
WTH2403B	22.2 °C	57.7 %RH	57.3 %RH	04/06/2024

Clause 4.3 Manipulation test prior to infill removal test. (Maximum overall time limit 15 minutes)

Craft knife used to cut away left sash profile at the bottom hinge to access the hinge protector - no entry gained
 Craft knife used to cut away left sash profile at the bottom lock point to access cam - no entry gained
 Credit card and metal wire used on right sash profile at the bottom lock point to access cam - no entry gained
 Craft knife used to cut away right sash profile at the bottom lock point to access cam - no entry gained
 Craft knife used to cut away right sash profile at the bottom hinge to access the hinge protector - no entry gained

INFILL MEDIUM REMOVAL TEST

Sample No	Temperature	Measured Humidity	Adjusted humidity	Date
WTH2403B	22.3 °C	56.7 %RH	56.3 %RH	04/06/2024

Clause 4.4.2 Infill manual test

Craft knife used to cut vee notch in the left sash profile, 6mm chisel used to cut through to beading
 - No entry gained

MANUAL CHECK TEST

Sample No	Temperature	Measured Humidity	Adjusted humidity	Date
WTH2403B	22.6 °C	58.4 %RH	58.1 %RH	04/06/2024

Clause 4.6 Manual check test (note tools used and time taken)

2 nail bars used to lever at mid point hinge side of left sash - No entry gained
 2 nail bars used to lever at mid point between the L/H and R/H bottom corners of the right sash -
 No entry gained
 2 nail bars used to lever left sash mid way between the bottom and centre lock points - No entry gained

As no further potentially vulnerable attack points could be identified the test was halted.

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INFILL MEDIUM REMOVAL TEST

Sample No	Temperature		Measured Humidity		Adjusted humidity		Date
WTH2403A	22.3	°C	57.3	%RH	56.9	%RH	17/05/2024

Clause 4.4.3 Infill mechanical test

All four corners of glazing loaded in turn to 2000N and held for 10 seconds - No entry gained

ADDITIONAL MECHANICAL LOADING TEST

Sample No	Temperature		Measured Humidity		Adjusted humidity		Date
		°C		%RH	-4.0	%RH	

Clause 4.7 Additional mechanical loading test

MANIPULATION TEST

Sample No	Temperature		Measured Humidity		Adjusted humidity		Date
WTH2403A	22.3	°C	57.4	%RH	57.0	%RH	17/05/2024

Clause 4.3 Manipulation test if fixings exposed after mechanical loading test or additional mechanical loading test. (Test time 3 minutes)

No fixings visible

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INFILL MEDIUM REMOVAL TEST

Sample No	Temperature		Measured Humidity		Adjusted humidity		Date
WTH2403B	22	°C	57.1	%RH	56.7	%RH	04/06/2024

Clause 4.4.3 Infill mechanical test

All four corners of glazing loaded in turn to 2000N and held for 10 seconds - No entry gained

ADDITIONAL MECHANICAL LOADING TEST

Sample No	Temperature		Measured Humidity		Adjusted humidity		Date
		°C		%RH	-4.0	%RH	

Clause 4.7 Additional mechanical loading test

MANIPULATION TEST

Sample No	Temperature		Measured Humidity		Adjusted humidity		Date
WTH2403A	22.1	°C	57.3	%RH	56.9	%RH	04/06/2024

Clause 4.3 Manipulation test if fixings exposed after mechanical loading test or additional mechanical loading test. (Test time 3 minutes)

No fixings visible



MECHANICAL LOAD TEST

Clause 4.5 Mechanical Load test

Sample No	Temperature	Measured Humidity	Adjusted humidity	Date
WTH2403A	21.3 °C	64.1 %RH	64.2 %RH	16/05/2024
Load location	Parallel to plain load (1000N)	Perpendicular to plain load (3000N)	Observations / Assessment	
1 Top hinge and hinge protector L/H sash Vertically down	Load applied	Load applied	No entry gained	
	1007N	2998N		
	Applied for (s)	Applied for (s)		
	22s	10s		
1 Top hinge and hinge protector L/H sash Horizontal	Load applied	Load applied	No entry gained	
	1002N	3002N		
	Applied for (s)	Applied for (s)		
	27s	10s		
2 Top opening corner of L/H sash and Top lock point Vertically down	Load applied	Load applied	No entry gained	
	1005N	3002N		
	Applied for (s)	Applied for (s)		
	29s	10s		
2 Top opening corner of L/H sash and Top lock point Horizontal + mullion pull	Load applied	Load applied	No entry gained	
	997N	3007N		
	Applied for (s)	Applied for (s)		
	33s	10s		
3 Centre lock point L/H sash Vertically down	Load applied	Load applied	No entry gained	
	1004N	3008N		
	Applied for (s)	Applied for (s)		
	27s	10s		
3 Centre lock point L/H sash Horizontal + mullion pull	Load applied	Load applied	No entry gained	
	1001N	3032N		
	Applied for (s)	Applied for (s)		
	34s	10s		
4 Bottom opening corner of L/H sash and bottom lock point lock point Vertically down	Load applied	Load applied	No entry gained	
	997N	3000N		
	Applied for (s)	Applied for (s)		
	32s	10s		
4 Bottom opening corner of L/H sash and bottom lock point lock point Vertically up	Load applied	Load applied	No entry gained	
	998N	3008N		
	Applied for (s)	Applied for (s)		
	33s	10s		
4 Bottom opening corner of L/H sash and bottom lock point lock point Horizontal + mullion pull	Load applied	Load applied	No entry gained	
	1007N	3007N		
	Applied for (s)	Applied for (s)		
	33s	10 s		
5 Bottom hinge and hinge protector L/H sash Vertically up	Load applied	Load applied	No entry gained	
	1004N	3012N		
	Applied for (s)	Applied for (s)		
	33s	10s		
5 Bottom hinge and hinge protector L/H sash Horizontal	Load applied	Load applied	No entry gained	
	1009N	3012N		
	Applied for (s)	Applied for (s)		
	34s	10s		

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MECHANICAL LOAD TEST CONT.

Clause 4.5 Mechanical Load test

Sample No	Temperature	Measured Humidity	Adjusted humidity	Date
WTH2403A	21.9 °C	63.7 %RH	63.7 %RH	16/05/2024
Load location	Parallel to plain load (1000N)	Perpendicular to plain load (3000N)	Observations / Assessment	
6 Top hinge and hinge protector R/H sash Vertically down	Load applied	Load applied	No entry gained	
	1002N	3007N		
	Applied for (s)	Applied for (s)		
	26s	10s		
6 Top hinge and hinge protector R/H sash Horizontal	Load applied	Load applied	No entry gained	
	1010N	2998N		
	Applied for (s)	Applied for (s)		
	29s	10s		
7 Top opening corner of R/H sash and Top lock point Vertically down	Load applied	Load applied	No entry gained	
	1001N	3012N		
	Applied for (s)	Applied for (s)		
	27s	10s		
7 Top opening corner of R/H sash and Top lock point Horizontal + mullion pull	Load applied	Load applied	No entry gained	
	1004N	3012N		
	Applied for (s)	Applied for (s)		
	34s	10s		
8 Centre lock point R/H sash Vertically down	Load applied	Load applied	No entry gained	
	1008N	3004N		
	Applied for (s)	Applied for (s)		
	32s	10s		
8 Centre lock point R/H sash Horizontal + mullion pull	Load applied	Load applied	No entry gained	
	1000N	3010N		
	Applied for (s)	Applied for (s)		
	34s	10s		
9 Bottom opening corner of R/H sash and bottom lock point Vertically down	Load applied	Load applied	No entry gained	
	1005N	3016N		
	Applied for (s)	Applied for (s)		
	35s	10s		
9 Bottom opening corner of RH sash and bottom lock point Vertically up	Load applied	Load applied	No entry gained	
	1002N	3005N		
	Applied for (s)	Applied for (s)		
	32s	10s		
9 Bottom opening corner of R/H sash and bottom lock point Horizontal + mullion pull	Load applied	Load applied	No entry gained	
	999N	3002N		
	Applied for (s)	Applied for (s)		
	31s	10s		
10 Bottom hinge and hinge protector R/H sash Vertically up	Load applied	Load applied	No entry gained	
	999N	3004N		
	Applied for (s)	Applied for (s)		
	34s	10s		
10 Bottom hinge and hinge protector R/H sash Horizontal	Load applied	Load applied	No entry gained	
	1004N	3001N		
	Applied for (s)	Applied for (s)		
	35s	10s		



PICTURE OF TEST WINDOW



END OF REPORT

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Revision History

Issue No:	WTH2403#2-1 Rev 1	Re-Issue date:	05/03/2025
Revised By:	D.Kury	Approved by:	B.Powell
Reason for revision:	Incorrect template used for report (old version) Report re-issued on correct template.		

Issue No:		Re-Issue date:	
Revised By:		Approved by:	
Reason for revision:			