Test Report No:	WTH1910#3-1
Date:	03/02/2020
Testing of:	Single top hung flush casement window
Tested to:	PAS 24 : 2016
Prepared for:	Nico Manufacturing Ltd

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TEST REQUESTED BY

Origin of test request

Company Name	Nico Manufacturing Ltd
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Contact	Ian Harrison
Contact position	Sales Director

Quotation Details

Quotation No.	WTH1910
Dated:	01/10/2019

DETAILS OF TEST

Description	Single top hung
Model / type	Projecting flush casement window
Make / Brand	Liniar
Any special requirements	

Test Specification	PAS24:2016 Enhanced security performance requirements for doorsets and windows in the UK
Date sample received	31/10/2019
Date testing started	04/02/2020
Date testing finished	05/02/2020
Job No.	WTH1910
Any special requirements	

C.4.3 Manipulation test. - Using a variety of tools as detailed in Annex A of PAS24:2016 attempts are made to gain entry by such methods as removal of trim, insertion of tools to slide latches or bolts, undoing threaded fasteners and blows by hand to dislodge locking devices. Test a) takes place prior to infill removal test and test b) after the mechanical loading test.

Test a) Duration 15 minutes with no single technique being used for more than 3 minutes

Test b) Duration 3 minutes with the primary intention of releasing threaded fasteners exposed as a result of the mechanical loading test.

C.4.4.2 Infill medium removal test, Manual. - Using a variety of tools as detailed in Annex A of PAS24:2016 attempts are made to remove gaskets, beads, security devices and then infill medium.

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 via a 150mm x 150mm wooden block 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 24:2016.

C.4.6 Manual check test. - Using the tools specified in PAS 24:2016 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.

DETAILS OF SAMPLE

Sample details	WTH1910C
Fabricator	Britannia Windows (UK) Ltd
Material:	PVC-U Liniar part numbers; Frame - LCW011, Sash - LSW030 Reinforcement, frame & sash - LAN101
Finish	Gloss white
Lock & keeps	Nico Triple lock shootbolt, comprising; Gearbox - part no 93805, shootbolt extensions - part no 93845-TR Nico cast zinc keeps - part nos 9328L, R & C
Hinges & protectors	Hinges; Nico 24" Standard Top hung hinges, part no 8260 Hinge protector; Nico Xtra bolt, part no 8100
Handle	VBH Alpha cranked handles, part no 2QEH1102 (RH)
Fixings	Lock - 4.3 x 32mm c'sk head gimlet point Keeps - 4.3 x 25mm c'sk head gimlet point Hinges - 4.3 x 25mm pan head gimlet point to sash and frame Hinge protector - 4.3 x 25mm pan head gimlet point to sash and frame Interlocking wedges - 4.3 x 25mm pan head gimlet point to sash and frame
Weather sealing	Co extruded gasket on outer frame Wool pile on sash
Glass (or infill)	4-20-4mm toughened glass unit
Glazing system	Internally bead glazed with co extruded gaskets
Sample dimensions	1200 x 1200mm
Additional information	

CONCLUSIONS OF TEST

Clause No.	Test Description	Test result
C.4.3	Manipulation test a)	Pass
C.4.3	Manipulation test b)	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

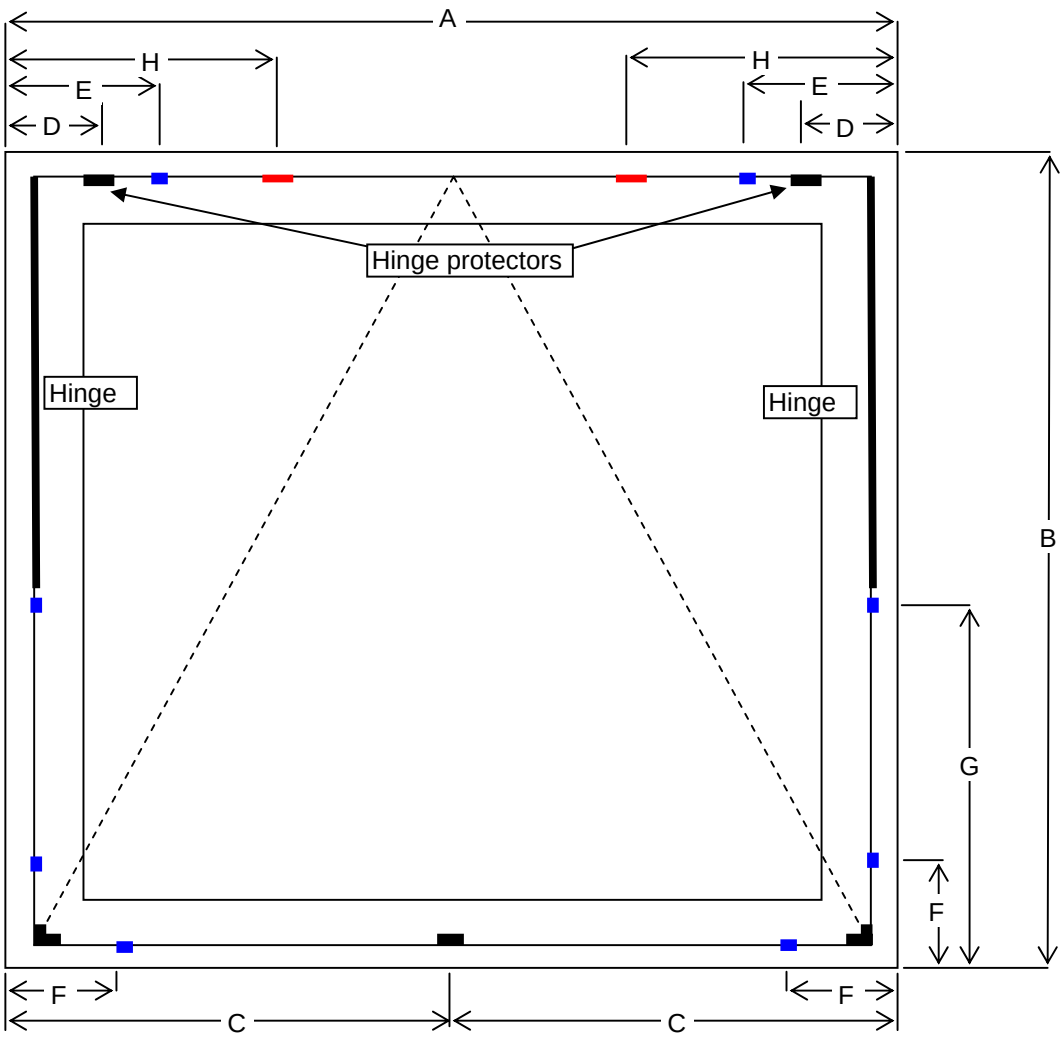
The results contained in this report apply only to the samples tested and to the specific tests carried out within this report.

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.

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 24:2016 Clause C.4.1

TEST WINDOW DRAWING



Run up blocks

Weather wedges

A	=	1200	mm
B	=	1200	mm
C	=	600	mm
D	=	125	mm
E	=	200	mm
F	=	150	mm
G	=	530	mm
H	=	360	mm

MANIPULATION TEST

Sample No	WTH1910C	Temperature	20°C	Humidity	39%RH	Date	05/02/2020

Clause 4.3 Manipulation test a)

Craft knife used to cut away sash profile around L/H lock corner, 3mm flat blade screwdriver used in attempt to disengage shootbolt and to try to remove fixing screws. No entry gained

Craft knife used to cut away sash profile around R/H side of gearbox, 3mm flat blade screwdriver used to lever gearbox cover plate and then to try to disengage shootbolt extension from gearbox. No entry gained

Paint scraper and 3mm flat blade screwdriver used to disengage shootbolt extension from gearbox and retract it (area where sash profile had previously benn cut away), paint scraper and screwdriver used in attempt to lever sash. No entry gained

Craft knife used to cut away sash & frame profile around L/H side of gearbox, paint scraper used to disengage & retract shootbolt extension, paint scraper used to lever sash. No entry gained

Craft knife used to cut away sash & frame profile around L/H hinge corner, 3mm flat blade screwdriver used in attempt to disengage hinge protector & hinges. No entry gained

3mm flat blade screwdriver and paint scraper used in attempt to disengage hinge & hinge protectors. No entry gained

INFILL MEDIUM REMOVAL TEST

Sample No	WTH1910C	Temperature	20°C	Humidity	39%RH	Date	05/02/2020

Clause 4.4.2 Infill manual test

Craft knife used to cut vee notch in sash 6mm chisel and 6mm flat blade screwdriver used with hand blows in attempt to remove glazing bead. No entry gained

MANUAL CHECK TEST

Sample No	WTH1910C	Temperature	20°C	Humidity	39%RH	Date	05/02/2020

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

2 x Nail bar used to lever at mid point down L/H side of sash. No entry gained

2 x Nail bar used to lever at mid point between centre lock point and L/H side of sash. No entry gained

2 x Nail bar used to lever at mid point on hinge side of sash. No entry gained

2 x Nail bar used to lever approx 200mm from R/H hinge corner on R/H side of sash. No entry gained

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

IINFILL MEDIUM REMOVAL TEST

Sample No	WTH1910C	Temperature	19°C	Humidity	33%RH	Date	04/02/2020

Clause 4.4.3 Infill mechanical test

All four corners of the glazing loaded to 2000N and held for 10 seconds in turn.

No entry gained

ADDITIONAL MECHANICAL LOADING TEST

Sample No		Temperature	°C	Humidity	%RH	Date	

Clause 4.7 Additional mechanical loading test

MANIPULATION TEST

Sample No	WTH1910C	Temperature	20°C	Humidity	37%RH	Date	05/02/2020

Clause 4.3 Manipulation test b)

3mm flat blade screwdriver used in attempt to remove fixings from L/H hinge protector which were partially visible. No entry gained

MECHANICAL LOAD TEST CONT.

Clause 4.5 Mechanical Load test

Sample No	WTH1910C	Temperature	19°C	Humidity	33%RH	Date	04/02/2020

Load location	Parallel to plain load	Perpendicular to plain load	Observations / Assessment
1 R/H hinge corner Hinge & hinge protector Horizontal	1000 N (10 sec)	3000 N (10 sec)	Held for 10 seconds
1 R/H hinge corner Hinge & hinge protector Vertically down	1000 N (10 sec)	3000 N (10 sec)	Held for 10 seconds
2 R/H lock corner & lock point Horizontal	1000 N (10 sec)	3000 N (10 sec)	Held for 10 seconds
2 R/H lock corner & lock point Vertically up	1000 N (10 sec)	3000 N (10 sec)	Held for 10 seconds
3 Centre lock point Horizontal	1000 N (10 sec)	3000 N (10 sec)	Held for 10 seconds
3 Central lock point Vertically up	1000 N (10 sec)	3000 N (10 sec)	As load reached 2900N locking cams snapped off, sash deflected more than 50mm, no entry gained.
4 L/H lock corner & lock point Horizontal	1000 N (10 sec)	3000 N (10 sec)	Start new test cycle Held for 10 seconds
4 L/H lock corner & lock point Vertically up	1000 N (10 sec)	3000 N (10 sec)	Held for 10 seconds
5 L/H hinge corner Hinge & hinge protector Horizontal	1000 N (10 sec)	3000 N (10 sec)	Held for 10 seconds
5 L/H hinge corner Hinge & hinge protector Vertically down	1000 N (10 sec)	3000 N (10 sec)	Held for 10 seconds
1 R/H hinge corner Hinge & hinge protector Horizontal	1000 N (10 sec)	3000 N (10 sec)	Held for 10 seconds

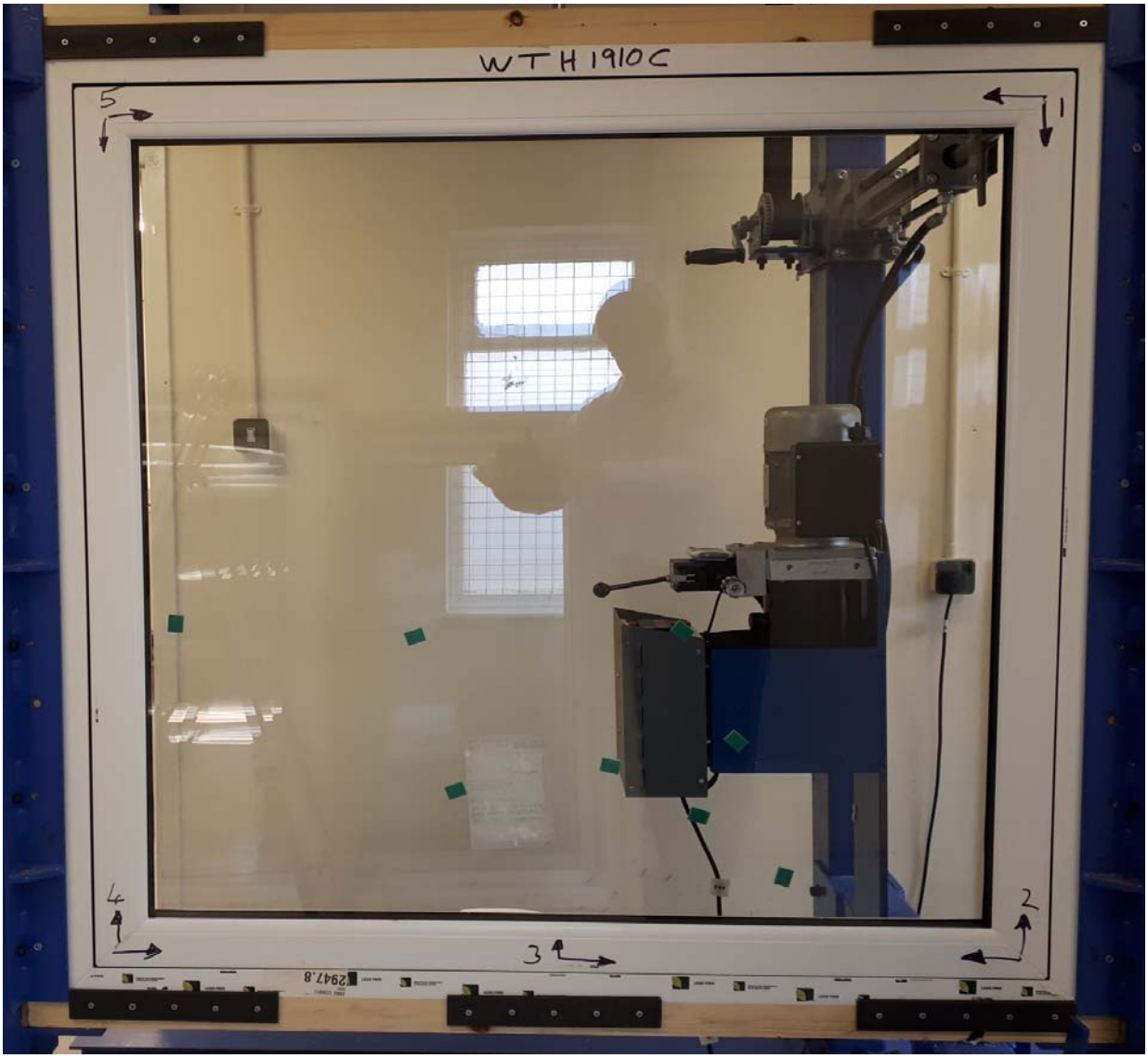
MECHANICAL LOAD TEST

Clause 4.5 Mechanical Load test

Sample No	WTH1910C	Temperature	20°C	Humidity	37%RH	Date	04/02/2020

Load location	Parallel to plain load	Perpendicular to plain load	Observations / Assessment
1 R/H hinge corner Hinge & hinge protector Vertically down	1000 N (10 sec)	3000 N (10 sec)	Held for 10 seconds
2 R/H lock corner & lock point Horizontal	1000 N (10 sec)	3000 N (10 sec)	Held for 10 seconds
2 R/H lock corner & lock point Vertically up	1000 N (10 sec)	3000 N (10 sec)	Held for 10 seconds
	1000 N (10 sec)	3000 N (10 sec)	
	1000 N (10 sec)	3000 N (10 sec)	
	1000 N (10 sec)	3000 N (10 sec)	
	1000 N (10 sec)	3000 N (10 sec)	
	1000 N (10 sec)	3000 N (10 sec)	
	1000 N (10 sec)	3000 N (10 sec)	
	1000 N (10 sec)	3000 N (10 sec)	
	1000 N (10 sec)	3000 N (10 sec)	

PICTURE OF TEST WINDOW



END OF REPORT