WINTECH
TESTING & CERTIFICATION

Technical Report

Report No	R17136
Product Tested:	Traditional Sliding Sash Window
Test Conducted for:	Mighton Products Ltd Rear of Hinxton Grange Saffron Walden Cambridgeshire CB10 1RG
Standard Specified:	PAS 24:2016 – Enhanced security performance requirements for doorsets and windows in the UK
Project No:	17136
Date of Test:	25th/30th November 2016
Test Conducted at:	Wintech Engineering Limited Halesfield 2 Telford Shropshire TF7 4QH
Test Conducted by:	D Knight – Laboratory Technician D Adams – Senior Laboratory Engineer
Report Compiled by:	S Tawn Laboratory Apprentice
Authorised by:	M Wass Technical Director

Contents

1. Introduction

This report describes testing of a window sample conducted at the test laboratory of Wintech Engineering Ltd on behalf of Mighton Products Ltd in order to determine compliance with PAS 24:2016.

Wintech Engineering Ltd is accredited by the United Kingdom Accreditation Service as UKAS Testing Laboratory No. 2223

2. Summary of Results

The following summarises the results of testing carried out, in accordance with PAS 24:2016

Test Description	*Result*
C.4.3 – Manipulation test (a)	*Pass*
C.4.4.2 – Infill manual test	*Pass*
C.4.6 – Manual check test	*Pass*
C.4.4.3 – Infill mechanical test	*Pass*
C.4.5 – Mechanical loading test	*Pass*
Overall Classification in accordance with PAS 24:2016	*W*

More comprehensive details are reported in Section 6.

Note: These results are valid only for the conditions under which the test was conducted

Note: All measurement devices, instruments and other relevant equipment were calibrated and traceable to National Standards.

3. Description of Test Sample

Product range name:	Traditional Sliding Sash Window
Configuration:	2 Sashes Sliding
Opening direction:	Vertical Sliding Sash

Outer Frame

Outer frame width:	1200mm	**Outer frame material:**	Pine
Outer frame height:	2000mm	**Outer frame gasket**	
Outer frame Part Numbers		Gasket type:	Aquarius
Top:	80x160mm	Manufacturer:	Mighton
Bottom:	80x160mm	Product name:	
Lock side:	80x160mm	Product code:	AQ21
Hinge side:	80x160mm	**Threshold**	
Outer frame section size		Manufacturer:	Mighton
Width:	80x160mm	Product name:	Cill
Depth:	80x160mm	Product code:	
Reinforcing:		Material:	Meranti
Manufacturer:	Not Applicable	**Outer frame joint method**	
Product name:	Woodscrews	Head:	Trench, Screwed & Glued
Product code:		Foot:	Trench, Screwed & Glued
Material:			

Leaf

Leaf width:	Top & Bottom Sash - 1034mm	**Leaf material:**	Pine
Leaf height:	Top:936mm – Bot 970mm	**Leaf gasket**	
Leaf Part Numbers		Gasket type:	Aquarius
Top:	Top rail – 56 x 56mm	Manufacturer:	Mighton
Bottom:	Meeting Rail – 66 x 50mm	Product name:	
Lock side:	Stiles – 56 x 56mm	Product code:	AQ21
Hinge side:		**Leaf midrail:**	
Leaf section size		Manufacturer:	
Width:		Product name:	
Depth:		Product code:	
Reinforcing:		Material:	
Manufacturer:		**Leaf joint method**	
Product name:		Head:	Finger or Comb Joints
Product code:		Foot:	Finger or Comb Joints
Material:			

Glazing

Glass unit		**Glazing gasket**	
Manufacturer:	PD Glass	Gasket type:	N/A
Inner thickness:	16mm	Manufacturer:	
Spacer material:	Aluminium Spacer	Product name:	
Outer thickness:	24mm	Product code:	
Unit sizes:	950x848mm	**Glazing clip**	
Bead		Manufacturer:	
Manufacturer:	Rouse Joinery	Product name:	
Product name:	Glazing Bead	Product code:	
Product code:		**Glazing tape details**	
Bead size:	16.5x15mm	Manufacturer:	Mighton
Bead material:	Pine	Product name:	Glazing Tape
		Product code:	DGT2X12BL25

Hardware

	Manufacturer:	Product description:	Product code:	Quantity:
Pulleys	Mighton	Ball Bearing Pulley	SBB2PVDR	4
Restrictor Non Locking	Mighton	Push Ventlock	PUSHVL	1
Sash Screws	Mighton	Sash Screws	DS70PB	2
Sash Lifts	Mighton	Sash Lifts	SLPVD	2
Locking Fastener	Mighton	Securifitch Locking	SECFKEYRHGLD	1
Non-Locking Fasteners	Mighton	Securifitch Non-Locking Fastener	SECFRHGLD	1
Restrictor locking	Mighton	Locking Ventlock	VL	1
Mighton Security Parting Bead	Mighton	Security Parting Bead	SBEAD	2
Mighton WPC Staff Bead	Mighton	WPC Staff Bead	MBEADS	4
Sash Balances	Mighton	Spiral Sash Balance AL	AL4030	2
Sash Balances	Mighton	Spiral Sash Balance D	D630	2
Meeting Rail Interlock	Mighton	Meeting Rail Interlock	MRI	1

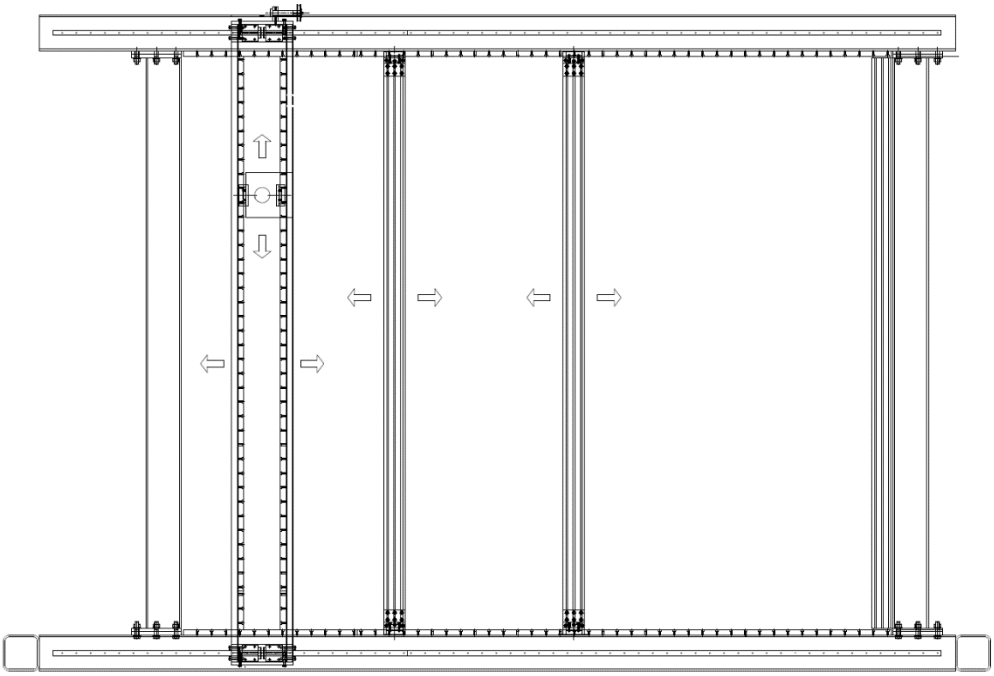
The details shown in Section 3 and drawings shown in Section 7 have been supplied by and confirmed as typical of normal production by Mighton Products Ltd and have not been verified by Wintech Engineering Limited.

4. Test Arrangement

4.1 Test Rig

The test sample was supplied mounted in 100 x 50 mm timber sub-frame in accordance with manufacturer's installation requirements. It was fitted into the test rig, shown below which was constructed to meet the requirements of the test specification and was fitted plumb, square and without twist or bends.

Figure 1 – Test rig used for testing



4.2 Attack Tool Groups

Tools group A
A.2.1.1 Assorted mild steel wire
A.2.1.2 Two credit cards
A.2.1.3 Two paint scrapers
A.2.1.4 One craft knife
A.2.1.5 Two flat blade screwdrivers, 150mm length

Tools group B
A.2.2.1 One 25mm wood chisel
A.2.2.2 One 6mm wood chisel
A.2.2.3 One flat blade screwdriver, 200mm length
A.2.2.4 One brick bolster
A.2.2.5 One crosspoint screwdriver, 200mm length
A.2.2.6 One cross head screwdriver, 200mm length

4.3 Mechanical Load Application

A series of parallel to plane loads and perpendicular to plane loads were applied to the products using hydraulic cylinders.

5. Test Procedures

5.1 Manipulation test (a)

The objective of this test was to highlight any inherent vulnerability in the design of the window which, from the outside, would permit entry by the hardware being operated, released or disengaged when tested using all of Tools group A from Section A.2.1 of PAS 24:2016 and, where applicable, tools specified in A.2.2.3, A.2.2.5 and A.2.2.6 in Tools group B from Section A.2.2 of PAS 24:2016. The overall attack time was limited to 15 minutes with no single attack technique being used for more than 3 minutes.

5.2 Infill manual test

The objective of this test was to assess the vulnerabilities of the infill retention system, including gaskets and beading, using Tools group A & Tools group B as described in section A.2.1 & A.2.2 of PAS 24:2016 for a maximum period of 3 minutes.

5.3 Manual check test – determine additional mechanical loading

The objective of this test was to assess any vulnerabilities of the sample that are not covered by the standard loading cases assessed in the mechanical loading test C.4.5. The tools described in Section B.4.6.2 of PAS 24:2016 were used for a maximum period of 15 minutes in an attempt to gain entry through the sample. No single location was tested for more than 6 minutes with no single attack technique being used for more than 3 minutes.

5.4 Infill mechanical test

The objective of this test was to assess the ability of the infill retention system to withstand the application of a 2.0 kN load to each corner of each infill without gaining entry through the sample in accordance with Section C.4.4.3 of PAS 24:2016.

5.5 Mechanical loading test

The objective of this test was to assess the ability of the sample to withstand a specified sequence of loading without gaining entry through the sample. The loads and loading sequence were in accordance with Section C.4.5 of PAS 24:2016.

5.6 Additional mechanical loading test

The objective of this test was to assess the ability of the sample to withstand the application of loads identified during the manual check test. The loads and loading sequence were in accordance with Section C.4.5 of PAS 24:2016.

5.7 Manipulation test (b)

The objective of this test was to release threaded fasteners exposed as a result of the mechanical loading test using all of Tools group A from Section A.2.1 of PAS 24:2016 and, where applicable, tools specified in A.2.2.3, A.2.2.5 and A.2.2.6 in Tools group B from Section A.2.2 of PAS 24:2016. The overall attack time was limited to 3 minutes

6. Test Results

6.1 Laboratory Conditions

Prior to the start of the test, the laboratory conditions were measured as follows:

Date	25/11/16	30/12/16
Temperature (°C)	26	18
Humidity (% RH)	26	36

Note The test samples were stored in a non-destructive environment at a temperature of 15 – 30°C for a minimum of 12 hours, testing was also conducted at those conditions. Prior to testing, the window was closed and locked and any keys were removed.

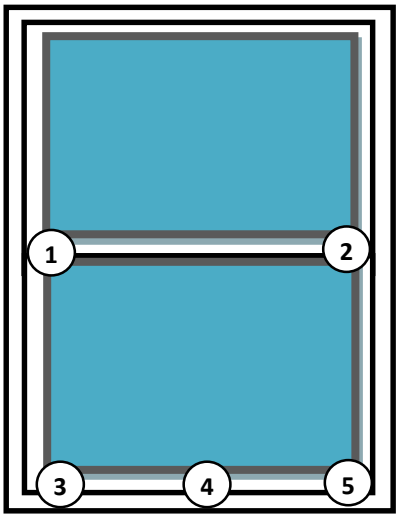
6.2 Manipulation test (a)

Attempts were made from the external face to operate, release and disengage the system hardware in order to gain entry through the sample in accordance with Section C.4.3 of PAS 24:2016. The results are as follows:

Table 1 – Manipulation test (a)

Location	Tools Used	Method	Time
Point 1	X2 paint scrapers	Used paint scrapers to attempt to dislodge hardware, unable to, no entry gained	03:00
Point 2	Craft knife	Cut through wood under locking clasp, no entry gained	03:00
Point 3	X2 paint scrapers	Used paint scrapers to attempt to lever sash, unable to, no entry gained	03:00
Point 4	X2 paint scrapers	Used paint scrapers to attempt to lever sash, unable to, no entry gained	03:00
Point 5	X2 paint scrapers	Used paint scrapers to attempt to lever sash, unable to, no entry gained	03:00

Figure 2 – Attack locations



6.3 Infill manual test

Attempts were made from the external face to remove gaskets and beading in order to gain access to and remove the infill using tools A.2.1 & A.2.2 in accordance with Section C.4.4.2 of PAS 24:2016.

No entry was gained throughout the test.

6.4 Manual check test

Attempts were made from the external face to gain entry through the sample by applying load combinations not covered by the standard loading cases for the mechanical loading test. The overall attack time was limited to 15 minutes with no single attack technique being used for more than 3 minutes and no single location being attacked for more than 6 minutes.

No entry was be gained during this test.

6.5 Infill mechanical test

A series of loads were applied to the external face of the infill as defined in Section C.4.4.3 of PAS 24:2016. A perpendicular-to-plane load of 2.0kN was applied and held for 8-12 seconds at each corner of the infill.

No entry was gained throughout this test.

6.6 Mechanical loading test

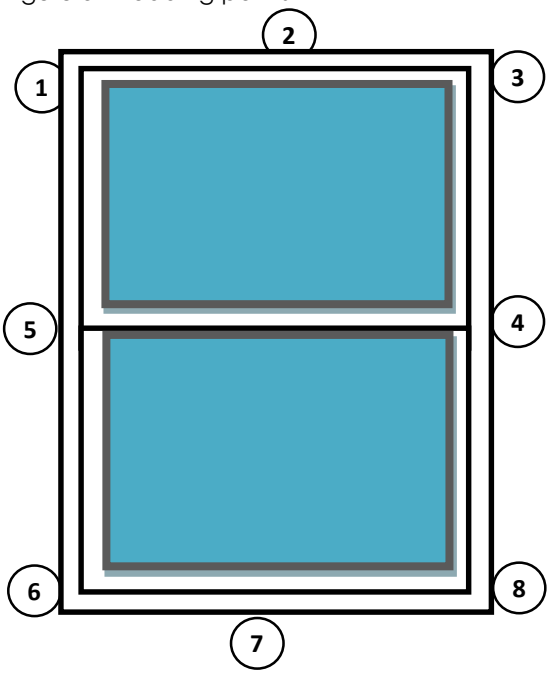
A series of loads were applied to the sample as defined in Section C.4.5 of PAS 24:2016. The loading combinations used were as defined in Table C.1 of PAS 24:2016 as shown in Table 2. The results are as follows:

Table 2 – Mechanical Loading

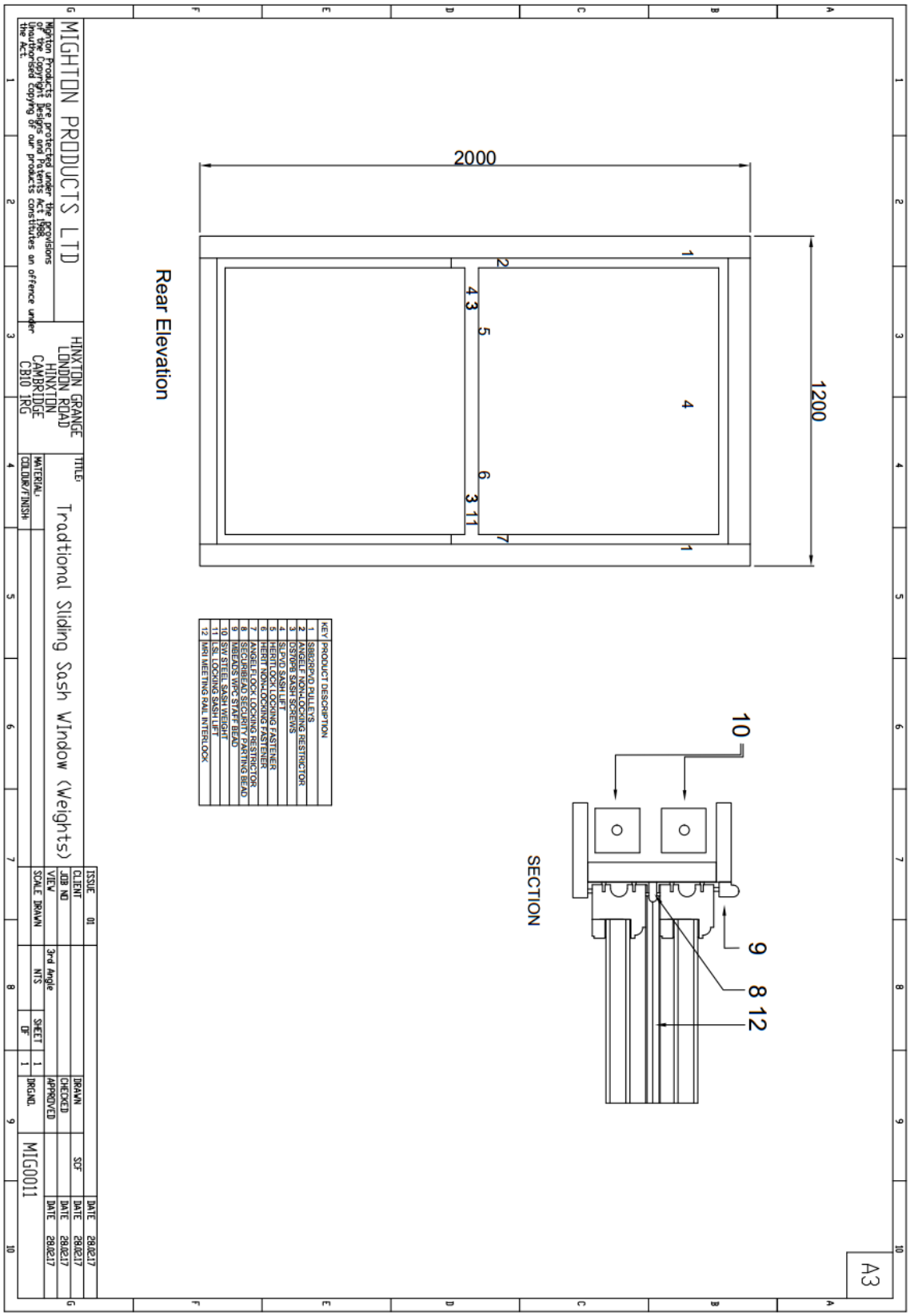
Loading Point	Parallel-to-plane Load		Perpendicular-to-plane Load		Result
	Load	Direction	Load	Direction	
1 – Non meeting Corner of sliding window	1 kN	→	3 kN	-	Pass
1 – Non meeting Corner of sliding window	3 kN	↓	1 kN	-	Pass
2 – Centre non meeting edge	3 kN	↓	-	-	Pass
3 – Non meeting Corner of sliding window	1 kN	←	3 kN	-	Pass
3 – Non meeting Corner of sliding window	3 kN	↓	1 kN	-	Pass
4 – Sash to sash locking point	-	-	3 kN	↔	Pass
4 – Meeting corner of sliding window	1 kN	←	3 kN	-	Pass
5 – Sash to sash locking point	-	-	3 kN	↔	Pass
5 – Meeting corner of sliding window	1 kN	→	3 kN	-	Pass
6 – Non meeting Corner of sliding window	1 kN	→	3 kN	-	Pass
6 – Non meeting Corner of sliding window	3 kN	↑	1 kN	-	Pass

7 – Centre non meeting edge	3 kN	↑	-	-	Pass
8 – Non meeting Corner of sliding window	1 kN	←	3 kN	-	Pass
8 – Non meeting Corner of sliding window	3 kN	↑	1 kN	-	Pass

Figure 3 – Loading points



7. System Drawings



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