

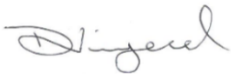
Test Report 3558613.
Smart Systems Limited
Incorporating Smart Extrusions

Introduction.

This report has been prepared by Jack Nicholls and relates to the activity detailed below:

Job/Registration Details	Client Details
Job number: 3558613 Job type: Testing Samples Submitted Start Date: 12/10/2021 Test type: Direct Sample ID: 10200493 Registration: NA Protocol: NA Quality system: NA Registration: NA Protocol: NA Quality system: NA	Smart Systems Limited Incorporating Smart Extrusions Arnolds Way Yatton BS49 4QN United Kingdom

The report has been approved for issue by David Vinyard – Senior Test Engineer

Approved For Issue	
	Issue Date: 18 October 2021

Objectives.

Direct Test

Product Scope.

Smart Systems Heritage Aluminium Window

Report Summary.

The sample was received on 12 October 2021 and the testing was started on 12 October 2021.

The sample submitted complied with the requirements of the test work conducted.

PAS24:2016 Direct Test.

Product Description.

1 off projecting side hung next to projecting side hung window

(Equipment Record No: 10200493)

Date Sample Received: 12 October 2021

Test Results.

- | | | |
|----|--------------------|--|
| 1. | Manipulation | The test sample met the requirements of the Specification in respect of Clause 4.3 |
| 2. | Glazing Removal | The test sample met the requirements of the Specification in respect of Clause 4.4 |
| 3. | Mechanical Loading | The test sample met the requirements of the Specification in respect of Clause 4.5 |
| 4. | Manual Check Test | The test sample met the requirements of the Specification in respect of Clause 4.6 |

Clause 2 Sample Selection.

The sample submitted for tests was selected by the Client on behalf of BSI.

Assessment.

The assessment of the test sample followed the sequence detailed in Scheme Document PCP519.

Clause 3 Test Apparatus and Sample Mounting.

The test apparatus used for the manual and mechanical tests is shown in figure 2 of this report. This apparatus meets the requirements of the Specification.

The test sample was submitted for test mounted in a 50 x 100mm timber subframe in accordance with the manufacturer's installation requirements. The test sample was manufactured by the client.

Description of Sample.

Sample type -	Projecting side hung next to projecting side hung window	
Material -	Aluminium	
Construction -	Cleated	
Fittings (Left Sash) -	<p>340mm Trojan mega egress side hung stays</p> <p>A six-point locking Trojan espagnolette system (six mushroom bolts) operated by a key locking handle 2 off pairs of Yale hinge protectors 4 off run up blocks</p>	
Fittings (Right Sash) -	<p>340mm Trojan mega egress side hung stays</p> <p>A six-point locking Trojan espagnolette system (six mushroom bolts) operated by a key locking handle 2 off pairs of Yale hinge protectors 4 off run up blocks</p>	
Classification	W	
Glass -	Double glazed, 4-20-4mm toughened glass sealed units	
Glazing System -	Internal beads and gaskets	
Weathersealing -	Double-sealed plastic weather strip	
Sample Dimensions -	For information only (nominal sizes)	
	Overall Size -	Length: 1840mm Height: 1420mm
	Sash Size -	Length: 900mm Height: 1400mm
	Sash Size -	Length: 900mm Height: 1400mm

Alitherm Heritage Casement Window. Pas 24 Side Hung Next to Side Hung. Trojan Espag

Outer Frame width	1841mm	Outer Frame Material	Aluminium
Outer Frame height	1425mm	Outer Frame Gasket	
Outer Frame Part Numbers		Gasket Type	EDPM
Top	W20015	Manufacturer	
Bottom	W20015	Product Name	Flipper Gasket
Lock Side	W20015	Product Code	ACVL032
Hinge Side	W20015	Threshold NA.	
Outer Frame section dimensions		Manufacturer	
Width	33mm	Product name	
Depth	52mm	Product Code	
Reinforcing: NA.		Materials	
Manufacturer		Outer Frame Joint Method	
Product Name		Head	Crimp and Glue
Product code		Foot	Crimp and Glue
Material			

Leaf		Leaf Material:	Aluminium
Leaf Width:	900mm	Leaf Gasket	
Leaf Height:	1400mm	Gasket type:	EDPM
Leaf Part Numbers:		Manufacturer:	
Top:	W20025	Product Name:	Flipper Gasket.
Bottom:	W20025	Product Code	ACVL032
Lock side:	W20025	Leaf Midrail:	NA.
Hinge Side	W20025	Manufacturer:	
Leaf section size		Product name:	
Width:	46mm	Product code:	
Depth:	52mm	Material:	
Reinforcing NA.		Leaf joint method	
Manufacturer:		Head:	Crimp and Glue
Product Name:		Foot:	Crimp and Glue
Product Code:			
Material:			
Bead			
Manufacturer:	Smart Systems		
Product Name:	Alitherm Heritage Glazing Bead.		
Product Code:	W20168		
Material:	Aluminium		
Bead Size:	15mm x 11.5mm		

Alitherm Heritage Casement Window. Pas 24.
Side Hung Next to Side Hung. Trojan Espag.

Glazing Unit		Glazing Gasket	
Manufacturer:	Ashton Glass	Gasket Type:	EDPM
Inner Thickness:	4mm	Manufacturer:	
Spacer Material:	Aluminium	Product Name:	E Gasket Wedge Gasket
Outer Thickness:	4mm	Product Code	ACET843 ACET840
Unit Sizes:	830mmx 1330mm	Glazing Clip	NA.
Glazing Tape Details NA,		Manufacturer:	
Manufacturer:		Product Name:	
Product Name:		Product Code	
Product Code			

Hardware			Fixings	Quantity
Hinges:	ACETME13	Trojan, Mega Egress.	ACET 064, ACET070	2 Pairs.
Hinge Protectors:	ACET513	Securistyle ADS1.	ACET064	4 PAIRS
Lock:	ACW205L + R	Trojan Espag and Keep.	ACET064	2
Cylinder:	NA.			
Handle:	ACET165 L + R.	Winlock.	M5 X 16mm	2
Touch Bar:	NA.			
Cylinder Support:	NA.			
Cylinder Escutcheon:	NA.			
Keeps:	ACW205	Supplied With Lock.	ACET064	4.
Drip Bar	NA.			
Run Up Blocks,	ACET380	Smart Systems	ACET060	8.
Handle Block.	ACW20229	Smart Systems	M5 X 16mm	2

Test Results.

Performance Requirements

Assessment

Clause 4.3 Manipulation Test A

The sample was mounted vertically in the test rig as described in Clause 3.

The test was carried out in accordance with the given objectives of this Clause using the tools specified in A.2.1

The sample was closed and locked and the key removed. Although there is a 15 minute overall time limit no one technique was used for more than three minutes.

No tools or techniques were effective.

No entry gained within the time allowed.

Pass

Date of test – 12 October 2021
Test engineer(s) – J Nicholls and E Creary
Laboratory temperature – 21.3°C

Clause 4.4 Infill Medium Removal Test

Clause 4.4.2 Manual Test

The sample was mounted vertically in the test rig as described in Clause 3.

The sample was assessed using the tools specified in A.2.1 Group A and A.2.2 Group B.

A craft knife was used to attack the glazing gasket.

No entry gained within the time allowed.

Pass

Date of test – 12 October 2021
Test engineer(s) – J Nicholls and E Creary
Laboratory temperature – 21.3°C

Test Results (Continued).

Performance Requirements (continued)

Assessment

Clause 4.4.3 Mechanical Test

The sample was mounted vertically in the test rig as described in Clause 3.

A perpendicular-to-plane load of 2.0kN was applied to each corner of the glazing in turn as specified in Clause 4.4.3.

No evidence of bead failure. No entry gained.

Pass

Date of test – 12 October 2021

Test engineer(s) – J Nicholls and E Creary

Laboratory temperature – 21.3°C

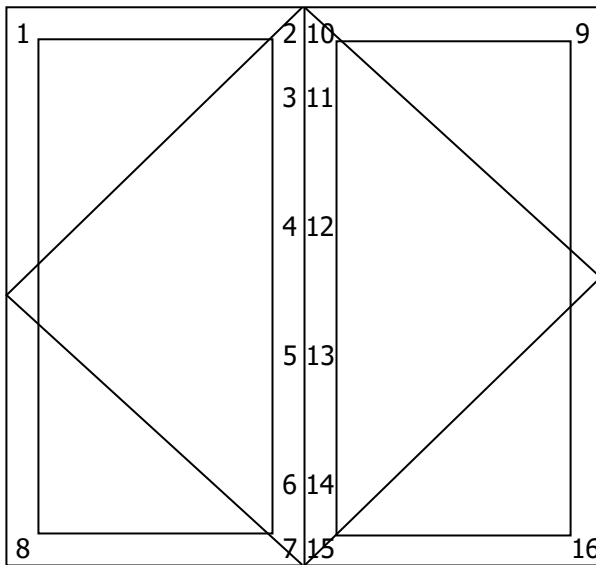
Test Results (Continued).

Clause 4.5 Mechanical Loading Test

The sample was mounted vertically in the test rig as described in Clause 3.

The test was carried out in accordance with the procedures detailed in Clause 4.5.2 using the apparatus detailed in Clause 3.

Diagram of load points



C.4.5.2 Loading Procedure

First Sequence

Point of application of load

1 - Hinge / Hinge Protector (left head)

Standard loading case used: 1 / 8

Load applied in plane: 1.0kN along the edge in the direction to disengage the hinge protector
 Load applied perpendicular to plane: 3.0kN applied for ten seconds

Load applied in plane: 1.0kN towards the opposite stay
 Load applied perpendicular to plane: 3.0kN applied for ten seconds

Test Results (Continued).

C.4.5.2 Loading Procedure (Continued)

First Sequence (Continued)

Point of application of load

2 - Corner / Mushroom Bolt (mullion head)

Standard loading case used: 5 / 7

Load applied in plane: 1.0kN along the edge in the direction to disengage the bolt
Load applied perpendicular to plane: 3.0kN applied for ten seconds

Loads applied in plane: 1.0kN at right angles to the edge and towards the opposite edge
1.0kN at right angles to the edge to oppose the above load
Load applied perpendicular to plane: 3.0kN applied for ten seconds

3 - Mushroom Bolt (upper mullion)

Standard loading case used: 7

Load applied in plane: 1.0kN along the edge in the direction to disengage the bolt
Load applied perpendicular to plane: 3.0kN applied for ten seconds

Loads applied in plane: 1.0kN at right angles to the edge and towards the opposite edge
1.0kN at right angles to the edge to oppose the above load
Load applied perpendicular to plane: 3.0kN applied for ten seconds

4 - Mushroom Bolt (upper mullion)

Standard loading case used: 7

Load applied in plane: 1.0kN along the edge in the direction to disengage the bolt
Load applied perpendicular to plane: 3.0kN applied for ten seconds

Loads applied in plane: 1.0kN at right angles to the edge and towards the opposite edge
1.0kN at right angles to the edge to oppose the above load
Load applied perpendicular to plane: 3.0kN applied for ten seconds

5 - Mushroom Bolt (lower mullion)

Standard loading case used: 7

Load applied in plane: 1.0kN along the edge in the direction to disengage the bolt
Load applied perpendicular to plane: 3.0kN applied for ten seconds

Loads applied in plane: 1.0kN at right angles to the edge and towards the opposite edge
1.0kN at right angles to the edge to oppose the above load
Load applied perpendicular to plane: 3.0kN applied for ten seconds

Test Results (Continued).

C.4.5.2 Loading Procedure (Continued)

First Sequence (Continued)

Point of application of load

6 - Mushroom Bolt (lower mullion)

Standard loading case used: 7

Load applied in plane: 1.0kN along the edge in the direction to disengage the bolt
Load applied perpendicular to plane: 3.0kN applied for ten seconds

Loads applied in plane: 1.0kN at right angles to the edge and towards the opposite edge
1.0kN at right angles to the edge to oppose the above load
Load applied perpendicular to plane: 3.0kN applied for ten seconds

7 - Corner / Mushroom Bolt (mullion sill)

Standard loading case used: 5 / 7

Load applied in plane: 1.0kN along the edge in the direction to disengage the bolt
Load applied perpendicular to plane: 3.0kN applied for ten seconds

Loads applied in plane: 1.0kN at right angles to the edge and towards the opposite edge
1.0kN at right angles to the edge to oppose the above load
Load applied perpendicular to plane: 3.0kN applied for ten seconds

8 - Hinge / Hinge Protector (left sill)

Standard loading case used: 1 / 8

Load applied in plane: 1.0kN along the edge in the direction to disengage the hinge protector
Load applied perpendicular to plane: 3.0kN applied for ten seconds

Load applied in plane: 1.0kN towards the opposite stay
Load applied perpendicular to plane: 3.0kN applied for ten seconds

9 - Hinge / Hinge Protector (right head)

Standard loading case used: 1 / 8

Load applied in plane: 1.0kN along the edge in the direction to disengage the hinge protector
Load applied perpendicular to plane: 3.0kN applied for ten seconds

Load applied in plane: 1.0kN towards the opposite stay
Load applied perpendicular to plane: 3.0kN applied for ten seconds

Test Results (Continued).

C.4.5.2 Loading Procedure (Continued)

First Sequence (Continued)

Point of application of load

10 - Corner / Mushroom Bolt (mullion head)

Standard loading case used: 5 / 7

Load applied in plane: 1.0kN along the edge in the direction to disengage the bolt
Load applied perpendicular to plane: 3.0kN applied for ten seconds

Loads applied in plane: 1.0kN at right angles to the edge and towards the opposite edge
1.0kN at right angles to the edge to oppose the above load
Load applied perpendicular to plane: 3.0kN applied for ten seconds

11 - Mushroom Bolt (upper mullion)

Standard loading case used: 7

Load applied in plane: 1.0kN along the edge in the direction to disengage the bolt
Load applied perpendicular to plane: 3.0kN applied for ten seconds

Loads applied in plane: 1.0kN at right angles to the edge and towards the opposite edge
1.0kN at right angles to the edge to oppose the above load
Load applied perpendicular to plane: 3.0kN applied for ten seconds

12 - Mushroom Bolt (upper mullion)

Standard loading case used: 7

Load applied in plane: 1.0kN along the edge in the direction to disengage the bolt
Load applied perpendicular to plane: 3.0kN applied for ten seconds

Loads applied in plane: 1.0kN at right angles to the edge and towards the opposite edge
1.0kN at right angles to the edge to oppose the above load
Load applied perpendicular to plane: 3.0kN applied for ten seconds

13 - Mushroom Bolt (lower mullion)

Standard loading case used: 7

Load applied in plane: 1.0kN along the edge in the direction to disengage the bolt
Load applied perpendicular to plane: 3.0kN applied for ten seconds

Loads applied in plane: 1.0kN at right angles to the edge and towards the opposite edge
1.0kN at right angles to the edge to oppose the above load
Load applied perpendicular to plane: 3.0kN applied for ten seconds

Test Results (Continued).

Performance Requirements (continued)

Assessment

C.4.5.2 Loading Procedure (Continued)

First Sequence (Continued)

Point of application of load

14 - Mushroom Bolt (lower mullion)

Standard loading case used: 7

Load applied in plane: 1.0kN along the edge in the direction to disengage the bolt
Load applied perpendicular to plane: 3.0kN applied for ten seconds

Loads applied in plane: 1.0kN at right angles to the edge and towards the opposite edge
1.0kN at right angles to the edge to oppose the above load
Load applied perpendicular to plane: 3.0kN applied for ten seconds

15 - Corner / Mushroom Bolt (mullion sill)

Standard loading case used: 5 / 7

Load applied in plane: 1.0kN along the edge in the direction to disengage the bolt
Load applied perpendicular to plane: 3.0kN applied for ten seconds

Loads applied in plane: 1.0kN at right angles to the edge and towards the opposite edge
1.0kN at right angles to the edge to oppose the above load
Load applied perpendicular to plane: 3.0kN applied for ten seconds

16 - Hinge / Hinge Protector (right sill)

Standard loading case used: 1 / 8

Load applied in plane: 1.0kN along the edge in the direction to disengage the hinge protector
Load applied perpendicular to plane: 3.0kN applied for ten seconds

Load applied in plane: 1.0kN towards the opposite stay
Load applied perpendicular to plane: 3.0kN applied for ten seconds

No entry gained

Pass

Date of test – 12 October 2021

Test engineer(s) – J Nicholls and E Creary

Laboratory temperature – 21.3°C

Test Results (Continued).

Performance Requirements (continued)

Assessment

C.4.3 Manipulation Test B

No fixings were exposed during mechanical loading.

Pass

Date of test – 12 October 2021
Test engineer(s) – J Nicholls and E Creary
Laboratory temperature – 21.3°C

Clause 4.6 Manual Check Test

The sample was mounted vertically in the test rig as described in Clause 3.

The test was carried out using the tools described in B.4.6.2 in accordance with the procedures detailed in C.4.6.2.

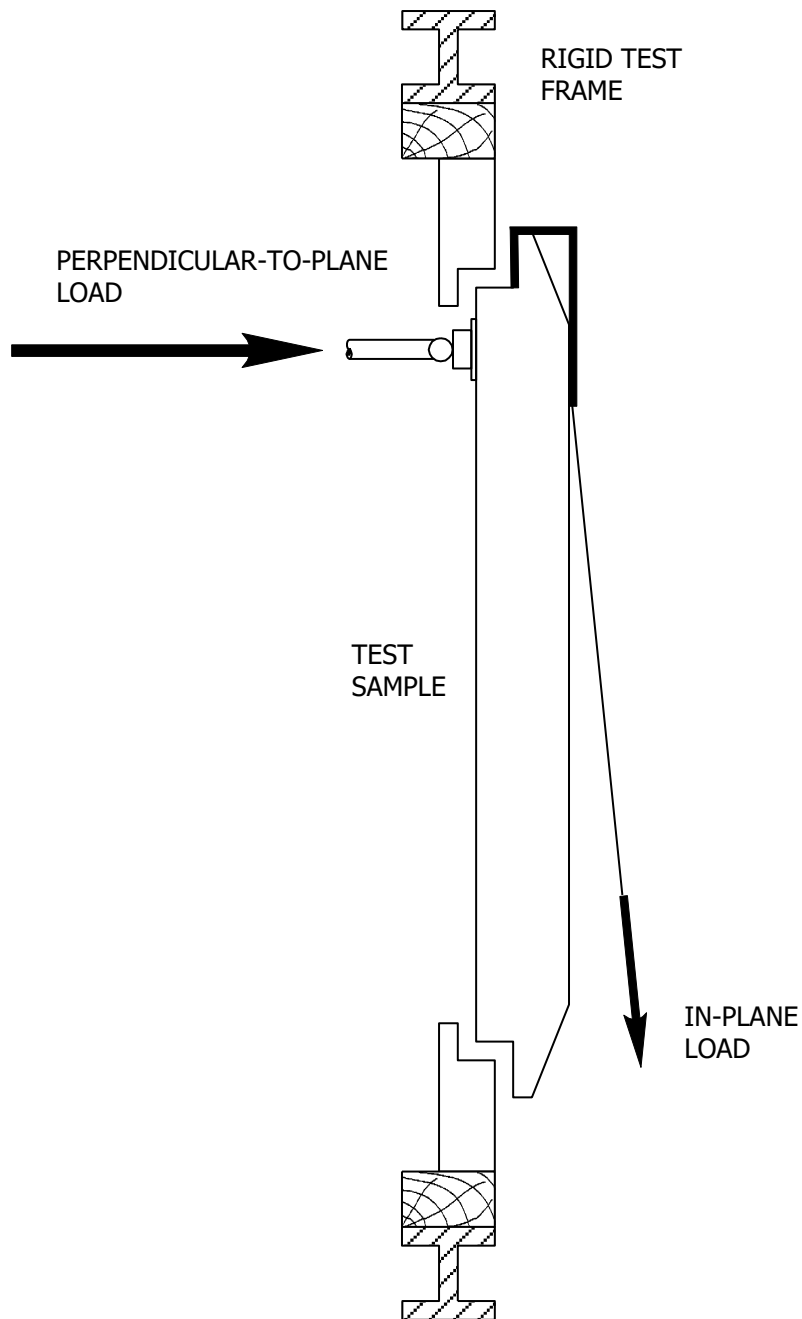
Two nail bars were used to no effect.

No alternative method of entry could be found.

Pass

Date of test – 12 October 2021
Test engineer(s) – J Nicholls and E Creary
Laboratory temperature – 21.3°C

Figure 2.



Photograph of Sample.



Test Sample.

Sample Id	ER Number	Description
1	101200493	Aluminium Window

Description of Test Sample.

Sample Description
1 off projecting side hung next to projecting side hung window

Test Requirements.

PAS24 Direct Test

Clause	Requirements
Results table	PAS24 Direct Test

Glossary of Terms.

PASS: Complies. Tested by BSI engineers at BSI laboratories.

PASS1: Complies. Witnessed by BSI engineers in manufacturers laboratory.

PASS2: Complies. Tests carried out by third party lab; results accepted by BSI.

PASS*: Report resulted in uncertainty and states that Compliance is more probable than non-compliance.

FAIL: Non compliance – Product does not meet the requirements of this clause.

FAIL*: Report resulted in uncertainty and states that Non-compliance is more probable than compliance.

N/A: Not applicable to design under consideration.

N/T: Not tested due to similarity to previously tested item; reference earlier test report.

Conditions of Issue.

This Test Report is issued subject to the conditions stated in current issue of 'BSI Terms of Service'. The results contained herein apply only to the particular sample(s) tested and to the specific tests carried out, as detailed in this Test Report. The issuing of this Test Report does not indicate any measure of Approval, Certification, Supervision, Control or Surveillance by BSI of any product. No extract, abridgement or abstraction from a Test Report may be published or used to advertise a product without the written consent of BSI, who reserve the absolute right to agree or reject all or any of the details of any items or publicity for which consent may be sought.

Should you wish to speak with BSI in relation to this report, please contact Customer Services on +44 (0)8450 80 9000.

BSI
Kitemark House
Maylands Avenue
Hemel Hempstead
Hertfordshire
HP2 4SQ



0135

Opinions and Interpretations expressed herein are outside the scope of our UKAS accreditation.

Unless otherwise stated, any results not obtained from testing in a BSI laboratory are outside the scope of our UKAS accreditation.

Where a statement of conformity is reported the decision, rule is simple acceptance unless stated otherwise.

*** End of Report ***