



# Test Report



Report No	2370/7782492	This Report consists of 18 pages
Client	Smart Systems Limited Arnolds Way Yatton BS49 4QN	
Authority & date	Request by client dated 20 December 2011	
Items tested	4 off Aluminium windows, Smart Systems Alitherm 600 Internally Glazed Casement Window Systems	
Specification	BS 7950:1997 Specification for enhanced security performance of casement and tilt/turn windows for domestic applications	
Results	Pass	
Prepared by	D Kirsop 	(Senior Technician)
Authorized by	M Manito 	(Senior Engineer)
Issue Date	08 February 2012	
Conditions of issue	This Test Report is issued subject to the conditions stated in current issue of CPO322 'General conditions relating to acceptance of testing'. 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 the Managing Director, BSI, who reserves the absolute right to agree or reject all or any of the details of any items or publicity for which consent may be sought.	



0135

## **TEST, EXAMINATION AND ASSESSMENT OF FOUR ALUMINIUM WINDOWS, SMART SYSTEMS ALITHERM 600**

### **INTRODUCTION**

At the request of the client the Aluminium windows, detailed below and described on pages 4 and 11, were tested and assessed to the requirements of BS 7950:1997 Specification for enhanced security performance of windows for domestic applications incorporating Amendments 14289 and 15666, as indicated on the following pages of this Report. This request was made on Quotation No BSI0000360080 dated 20 December 2011. It is emphasized that assessments have not been made against the other Clauses of the Specification.

### **TEST SAMPLE**

2 off projecting side hung next to projecting side hung windows (Sample 1)

2 off projecting top hung windows (Sample 2)

(Equipment Record No 10132932)

Date sample received: 2 February 2012

### **SUMMARY OF RESULTS**

- |    |                    |   |
|----|--------------------|---|
| 1. | Manipulation       | The test samples met the requirements of the Specification in respect of Clause 7 Annex A.4.  |
| 2. | Glazing removal    | The test samples met the requirements of the Specification in respect of Clause 7 Annex A.5.  |
| 3. | Mechanical loading | The test samples met the requirements of the Specification in respect of Clause 7 Annex A.6.  |
| 4. | Manual check test  | The test samples met the requirements of the Specification, in respect of Clause 7 Annex A.7. |

#### **CLAUSE 4 SAMPLE SELECTION**

The samples submitted for tests were selected by the Client.

#### **CLAUSE 5.2 ASSESSMENT**

The assessment of the test samples followed the sequence detailed in Scheme document PCP519.

#### **CLAUSE 6 TEST APPARATUS AND SAMPLE MOUNTING**

The test apparatus used for the manual and mechanical tests is shown in Appendix A of this Report. This apparatus meets the requirements of the Specification. Each test sample was submitted for test mounted in a 50 x 100mm timber subframe in accordance with the manufacturer's installation requirements.

**DESCRIPTION OF SAMPLE (Sample 1)**

<b>Sample type -</b>	Projecting side hung next to projecting side hung
<b>Material -</b>	Aluminium
<b>Construction -</b>	Cleated
<b>Fittings (each sash) -</b>	Friction stays: 16" Securistyle Defender side hung stays Locking: a six point lock (six mushroom bolts) Trojan reverse espagnolette system operated by a key locking handle 4 of run up blocks 2 of pairs of Vector Excluder hinge protectors
<b>Glass -</b>	Double glazed, 4-20-4mm toughened glass sealed units
<b>Glazing system -</b>	Internal beads and gaskets
<b>Sample dimensions -</b>	For information only (nominal sizes)  Overall size Length: 1455mm    Height: 1275mm  Sash sizes Length: 690mm    Height: 1195mm

## EXAMINATION AND TEST

Sample type - Projecting side hung next to projecting side hung

Date of test – 6 February 2012

Laboratory temperature – 19.1 °C

### CLAUSE 7 PERFORMANCE REQUIREMENTS

### ASSESSMENT

#### Annex A.4 Manipulation test

The sample was mounted vertically in the test rig as described in Annex A.2. The test was carried out in accordance with the given objective of this Annex using the implements described in Annex A.3.

The key for the lockable hardware was fully removable.  
No entry could be effected within 3 minutes.

Pass

#### Annex A.5 Glazing removal test

##### Annex A.5.1 Manual test

The sample was mounted vertically in the test rig as described in Annex A.2. The sample was assessed using a selection of tools as described in Annex A.3.

No entry could be effected within 3 minutes

Pass

##### Annex A.5.2 Mechanical test

The sample was mounted vertically in the test rig as described in Annex A.2. A perpendicular to plane load of 2.0kN was applied to each corner of the glazing in turn as specified in Annex A.5.2.

No evidence of bead failure  
No entry could be effected

Pass

## EXAMINATION AND TEST (CONTINUED)

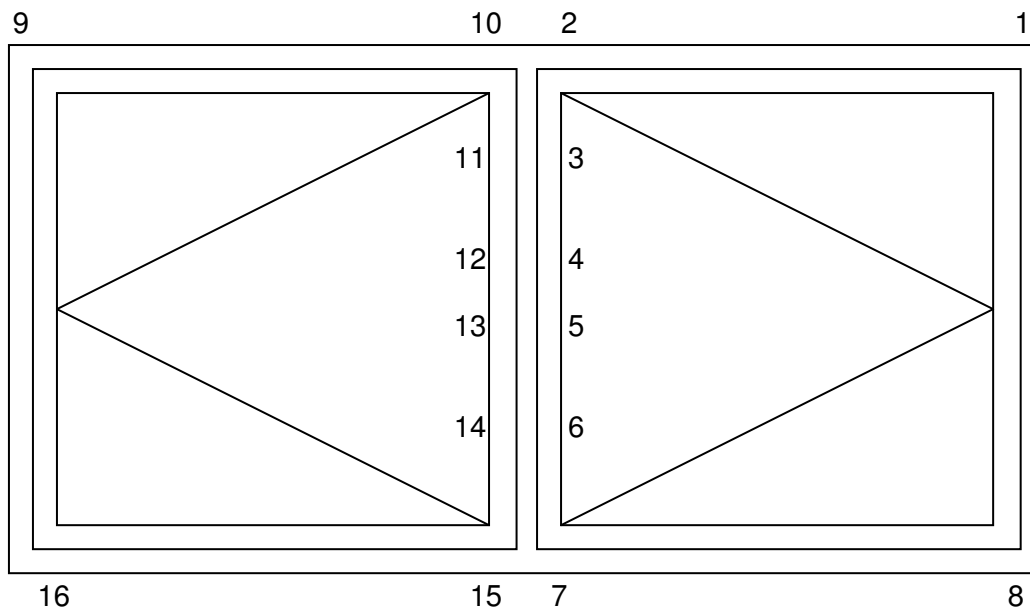
### CLAUSE 7 PERFORMANCE REQUIREMENTS

#### Annex A.6 Mechanical loading test

The sample was mounted vertically in the test rig as described in Annex A.2.

The test was carried out in accordance with the procedures detailed in Annex A.6 and Figure 1 using the test apparatus detailed in Appendix A of this test report.

Diagram of points of application of loads



#### Annex A.6.2 Loading procedure

Point of application of load (right hand light)

##### First sequence

1 - Hinge protector/Friction stay (right head)

Standard loading case used: 5/1

Load applied in plane: 1.0kN in direction to disengage hinge protector

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

Load applied in plane: 1.0kN towards opposite stay

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

**EXAMINATION AND TEST (CONTINUED)**

**ASSESSMENT**

**Annex A.6.2 Loading procedure**

Point of application of load

2 - Corner (mullion head)

Standard loading case used: 3

Load applied in plane: 1.0kN along edge in direction to disengage nearest locking point

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

Loads applied in plane: 1.0kN at right angles to edge and towards opposite edge

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

3 - Mushroom bolt/Mushroom bolt (upper mullion)

Standard loading case used: 4

Load applied in plane: 1.0kN along edge in direction to disengage bolt

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

Load applied in plane: 1.0kN along edge in direction to disengage bolt

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

Loads applied in plane: 1.0kN at right angles to edge and towards opposite edge

1.0kN at the mullion to oppose the above load

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

4 - Mushroom bolt (centre mullion)

Standard loading case used: 4

Load applied in plane: 1.0kN along edge in direction to disengage bolt

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

Loads applied in plane: 1.0kN at right angles to edge and towards opposite edge

1.0kN at the mullion to oppose the above load

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

5 - Mushroom bolt (centre mullion)

Standard loading case used: 4

Load applied in plane: 1.0kN along edge in direction to disengage bolt

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

Loads applied in plane: 1.0kN at right angles to edge and towards opposite edge

1.0kN at the mullion to oppose the above load

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

**EXAMINATION AND TEST (CONTINUED)**

**ASSESSMENT**

**Annex A.6.2 Loading procedure**

Point of application of load

6 - Mushroom bolt/Mushroom bolt (lower mullion)

Standard loading case used: 4

Load applied in plane: 1.0kN along edge in direction to disengage bolt

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

Load applied in plane: 1.0kN along edge in direction to disengage bolt

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

Loads applied in plane: 1.0kN at right angles to edge and towards opposite edge

1.0kN at the mullion to oppose the above load

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

7 - Corner (mullion sill)

Standard loading case used: 3

Load applied in plane: 1.0kN along edge in direction to disengage nearest locking point

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

Loads applied in plane: 1.0kN at right angles to edge and towards opposite edge

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

8 - Hinge protector/Friction stay (right sill)

Standard loading case used: 5/1

Load applied in plane: 1.0kN in direction to disengage hinge protector

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

Load applied in plane: 1.0kN towards opposite stay

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

No entry effected

Pass

Point of application of load (left hand light)

9 - Hinge protector/Friction stay (left head)

Standard loading case used: 5/1

Load applied in plane: 1.0kN in direction to disengage hinge protector

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

Load applied in plane: 1.0kN towards opposite stay

Load applied perpendicular to plane: 3.0kN applied for 10 seconds



## EXAMINATION AND TEST (CONTINUED)

## ASSESSMENT

### Annex A.6.2 Loading procedure

Point of application of load

#### 10 - Corner (mullion head)

Standard loading case used: 3

Load applied in plane: 1.0kN along edge in direction to disengage nearest locking point

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

Loads applied in plane: 1.0kN at right angles to edge and towards opposite edge

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

#### 11 - Mushroom bolt/Mushroom bolt (upper mullion)

Standard loading case used: 4

Load applied in plane: 1.0kN along edge in direction to disengage bolt

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

Load applied in plane: 1.0kN along edge in direction to disengage bolt

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

Loads applied in plane: 1.0kN at right angles to edge and towards opposite edge

1.0kN at the mullion to oppose the above load

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

#### 12 - Mushroom bolt (centre mullion)

Standard loading case used: 4

Load applied in plane: 1.0kN along edge in direction to disengage bolt

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

Loads applied in plane: 1.0kN at right angles to edge and towards opposite edge

1.0kN at the mullion to oppose the above load

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

#### 13 - Mushroom bolt (centre mullion)

Standard loading case used: 4

Load applied in plane: 1.0kN along edge in direction to disengage bolt

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

Loads applied in plane: 1.0kN at right angles to edge and towards opposite edge

1.0kN at the mullion to oppose the above load

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

## EXAMINATION AND TEST (CONTINUED)

## ASSESSMENT

### Annex A.6.2 Loading procedure

Point of application of load

#### 14 - Mushroom bolt/Mushroom bolt (lower mullion)

Standard loading case used: 4

Load applied in plane: 1.0kN along edge in direction to disengage bolt

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

Load applied in plane: 1.0kN along edge in direction to disengage bolt

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

Loads applied in plane: 1.0kN at right angles to edge and towards opposite edge

1.0kN at the mullion to oppose the above load

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

#### 15 - Corner (mullion sill)

Standard loading case used: 3

Load applied in plane: 1.0kN along edge in direction to disengage nearest locking point

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

Loads applied in plane: 1.0kN at right angles to edge and towards opposite edge

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

#### 16 - Hinge protector/Friction stay (left sill)

Standard loading case used: 5/1

Load applied in plane: 1.0kN in direction to disengage hinge protector

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

Load applied in plane: 1.0kN towards opposite stay

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

No entry effected

Pass

### Annex A.7 Manual check test

The sample was mounted vertically in the test rig as described in Annex A.2.

The test was carried out using the tools described in Annex A.7.2 in accordance with the procedures detailed in Annex A.7.3.

No alternative method of entry could be effected

Pass

### Annex A.8 Additional mechanical loading test

Not applicable as an alternative method of entry was not identified under Annex A.7.

**DESCRIPTION OF SAMPLE (Sample 2)**

<b>Sample type -</b>	Projecting top hung
<b>Material -</b>	Aluminium
<b>Construction -</b>	Cleated
<b>Fittings -</b>	Friction stays: 16" Securistyle Defender side hung stays Locking: a six point lock (six mushroom bolts) Trojan reverse espagnolette system operated by a key locking handle 4 of run up blocks 2 of pairs of Vector Excluder hinge protectors
<b>Glass -</b>	Double glazed, 4-20-4mm toughened glass sealed unit
<b>Glazing system -</b>	Internal beads and gaskets
<b>Sample dimensions -</b>	For information only (nominal sizes)  Overall size Length: 1455mm    Height: 1270mm  Sash sizes Length: 1400mm    Height: 1200mm

## EXAMINATION AND TEST

Sample type - Projecting top hung

Date of test – 6 February 2012

Laboratory temperature – 19.1 °C

## CLAUSE 7 PERFORMANCE REQUIREMENTS

## ASSESSMENT

### Annex A.4 Manipulation test

The sample was mounted vertically in the test rig as described in Annex A.2. The test was carried out in accordance with the given objective of this Annex using the implements described in Annex A.3.

The key for the lockable hardware was fully removable.  
No entry could be effected within 3 minutes.

Pass

### Annex A.5 Glazing removal test

#### Annex A.5.1 Manual test

The sample was mounted vertically in the test rig as described in Annex A.2. The sample was assessed using a selection of tools as described in Annex A.3.

No entry could be effected within 3 minutes

Pass

#### Annex A.5.2 Mechanical test

The sample was mounted vertically in the test rig as described in Annex A.2. A perpendicular to plane load of 2.0kN was applied to each corner of the glazing in turn as specified in Annex A.5.2.

No evidence of bead failure  
No entry could be effected

Pass

## EXAMINATION AND TEST (CONTINUED)

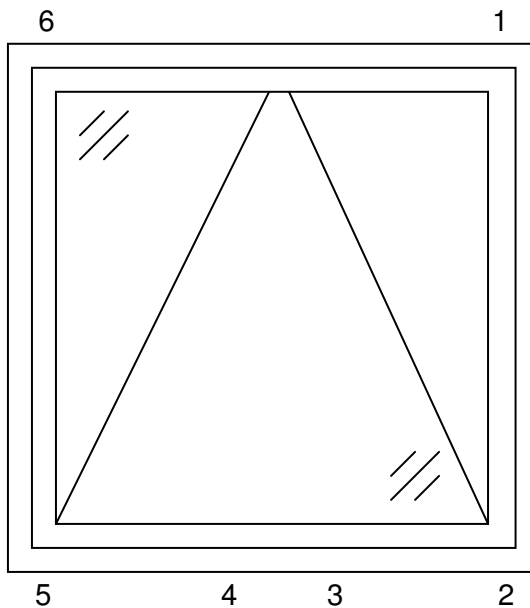
### CLAUSE 7 PERFORMANCE REQUIREMENTS

#### Annex A.6 Mechanical loading test

The sample was mounted vertically in the test rig as described in Annex A.2.

The test was carried out in accordance with the procedures detailed in Annex A.6 and Figure 1 using the test apparatus detailed in Appendix A of this test report.

Diagram of points of application of loads



#### Annex A.6.2 Loading procedure

Point of application of load

##### First sequence

1 - Hinge protector/Friction stay (right head)

Standard loading case used: 5/1

Load applied in plane: 1.0kN in direction to disengage hinge protector

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

Load applied in plane: 1.0kN towards opposite stay

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

## EXAMINATION AND TEST (CONTINUED)

## ASSESSMENT

### Annex A.6.2 Loading procedure

Point of application of load

2 - Corner/Mushroom bolt/Mushroom bolt (right sill)

Standard loading case used: 4

Load applied in plane: 1.0kN along edge in direction to disengage bolt

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

Load applied in plane: 1.0kN along edge in direction to disengage bolt

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

Loads applied in plane: 1.0kN at right angles to edge and towards opposite edge

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

3 - Mushroom bolt (centre sill)

Standard loading case used: 4

Load applied in plane: 1.0kN along edge in direction to disengage bolt

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

Loads applied in plane: 1.0kN at right angles to edge and towards opposite edge

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

4 - Mushroom bolt (centre sill)

Standard loading case used: 4

Load applied in plane: 1.0kN along edge in direction to disengage bolt

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

Loads applied in plane: 1.0kN at right angles to edge and towards opposite edge

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

5 - Corner/Mushroom bolt/Mushroom bolt (left sill)

Standard loading case used: 4

Load applied in plane: 1.0kN along edge in direction to disengage bolt

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

Load applied in plane: 1.0kN along edge in direction to disengage bolt

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

Loads applied in plane: 1.0kN at right angles to edge and towards opposite edge

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

**EXAMINATION AND TEST (CONTINUED)**

**ASSESSMENT**

**Annex A.6.2 Loading procedure**

Point of application of load

6 - Hinge protector/Friction stay (left head)

Standard loading case used: 5/1

Load applied in plane: 1.0kN in direction to disengage hinge protector

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

Load applied in plane: 1.0kN towards opposite stay

Load applied perpendicular to plane: 3.0kN applied for 10 seconds

No entry effected

Pass

**Annex A.7 Manual check test**

The sample was mounted vertically in the test rig as described in Annex A.2.

The test was carried out using the tools described in Annex A.7.2 in accordance with the procedures detailed in Annex A.7.3.

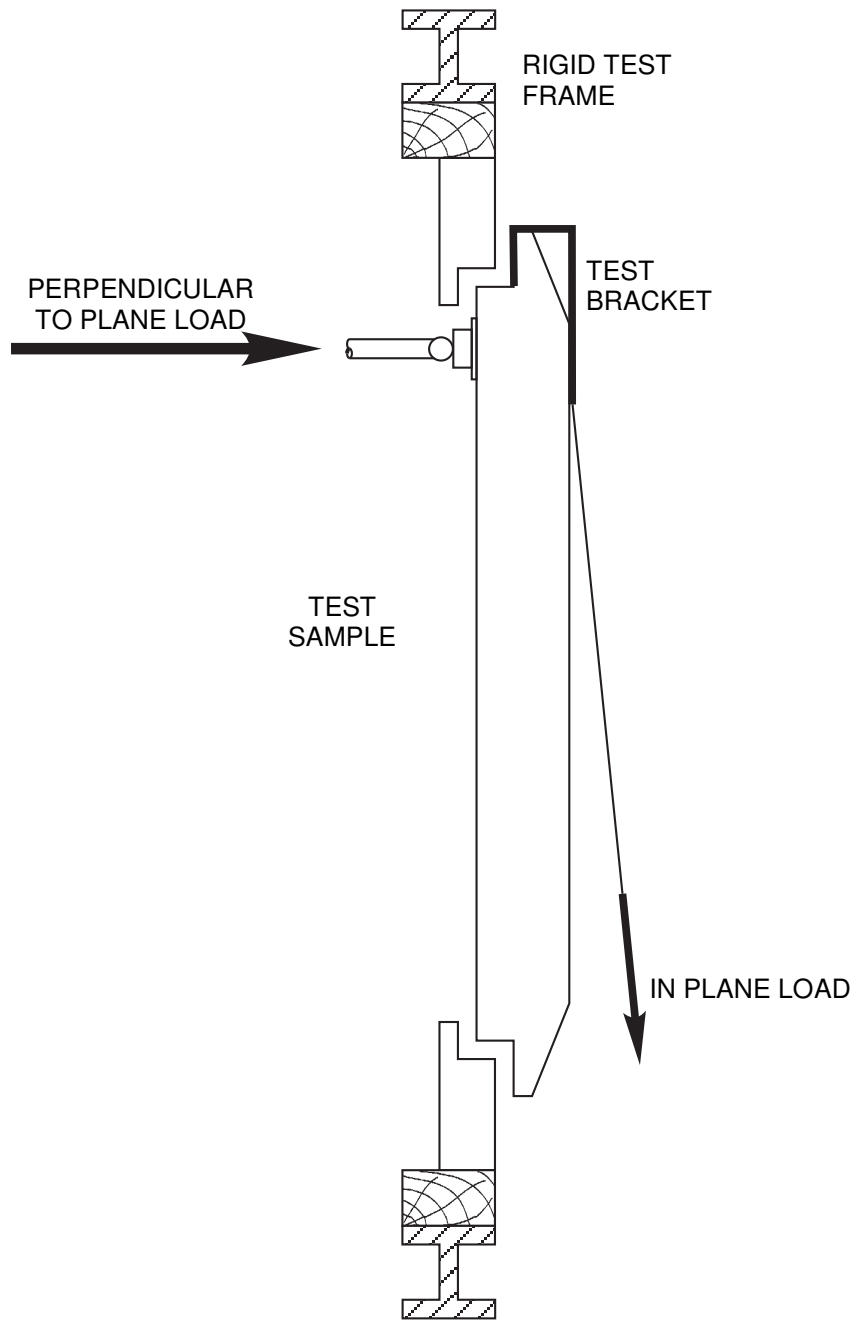
No alternative method of entry could be effected

Pass

**Annex A.8 Additional mechanical loading test**

Not applicable as an alternative method of entry was not identified under Annex A.7.

**APPENDIX A**



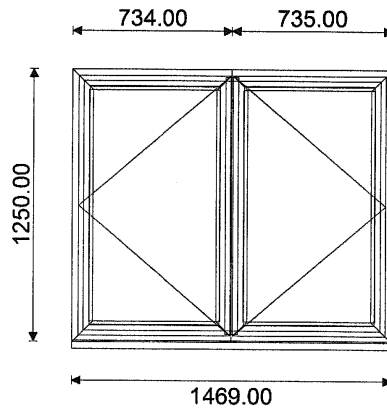


**APPENDIX B**

3

**Casemen**

ETC614: Outer Frame  
ETC623: Vent  
ETC631: Mullion/Transom  
ETC157: Cill  
NONE: Head Extension



1,469 mm x 1,275 mm ✓

QUALITY CONTROL	
Approved	
Cut	
Fabricated	
Checked	
Glazed	

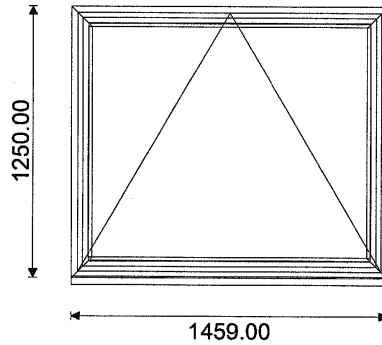
<b>Extrusions</b>		<b>End Prep</b>		<b>Qty</b>	<b>Total</b>	<b>Length</b>	<b>Status</b>
ETC157	Cill - 150mm SubCill	0.0T	0.0T	1	2	1,469 mm [ ]	
ETC272	28mm Square Bead	0.0T	0.0T	2	4	599.5 mm [ ]	
ETC272	28mm Square Bead	0.0T	0.0T	2	4	600.5 mm [ ]	
ETC272	28mm Square Bead	0.0T	0.0T	4	8	1,061 mm [ ]	
ETC614	70mm square Outerframe	45.0T	45.0T	2	4	1,250 mm [ ]	
ETC614	70mm square Outerframe	45.0T	45.0T	2	4	1,469 mm [ ]	
ETC623	Internally Glazed Chamfered Vent	-45.0T	-45.0T	2	4	698.5 mm [ ]	
ETC623	Internally Glazed Chamfered Vent	-45.0T	-45.0T	2	4	699.5 mm [ ]	
ETC623	Internally Glazed Chamfered Vent	-45.0T	-45.0T	4	8	1,191 mm [ ]	
ETC631	Large Transom Mullion Cleat Only	0.0T	0.0T	1	2	1,178 mm [ ]	
<b>Glazing</b>				<b>Qty</b>	<b>Total</b>	<b>Width</b>	<b>Height</b>
28MM	28mm Glazing			1	2	591.5	x 1,084 [ ]
28MM	28mm Glazing			1	2	592.5	x 1,084 [ ]
<b>Components</b>				<b>Qty</b>	<b>Total</b>	<b>Unit</b>	
ACET011	CornerCleat (Mechanical for 55)			12	24	Each	[ ]
ACET016	TransomCleat (for ETC131)			2	4	Each	[ ]
ACET044	Chevron S/S (for 55)			12	24	Each	[ ]
ACET060	Screws (for screwports) No. 6 x 1			12	24	Each	[ ]
ACET062	Screws (for Cills) No.10 x 2 CskSS STap			6	12	Each	[ ]
ACET064	Screws (for Handles) No. 8 X5/8 Csk Hd.			24	48	Each	[ ]
ACET068	Screws No.8 x 3/8 Flange Head			24	48	Each	[ ]
ACET069	Screws (for ACET081)			4	8	Each	[ ]
ACET157WP	Cill end cap			1	2	Each	[ ]
ACET165WPL	Espag Handle Left - White			1	2	Each	[ ]
ACET165WPR	Espag Handle Right - White			1	2	Each	[ ]
ACET604L	Trojan Rev' Espag'			1	2	Each	[ ]
ACET604R	Trojan Rev' Espag'			1	2	Each	[ ]
ACET680	Riser Block			2	4	Each	[ ]
ACET841	Low Line Gasket Captive for ali300			7	14	Each	[ ]
ACETHSSH16	FrictionStay 16" side hung (16mmStack)			2	4	Each	[ ]
ACVL032	Gasket - Small Flipper			15	30	Each	[ ]
ACW20034	4mm Wedge Gasket			7	14	Each	[ ]
HINGE PROTEC	Hinge Protectors (Pr)			4	8	Each	[ ]
WCA106SSZ	Aluminium Corner Chevron (Large)			24	48	Each	[ ]

APPENDIX B (Continued)

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Casemen

ETC614: Outer Frame  
ETC623: Vent  
ETC631: Mullion/Transom  
ETC157: Cill  
NONE: Head Extension



QUALITY CONTROL	
Approved	
Cut	
Fabricated	
Checked	
Glazed	

Extrusions		End Prep	Qty	Total	Length	Status
ETC157	Cill - 150mm SubCill	0.0T	0.0T	1	2	1,459 mm [ ]
ETC272	28mm Square Bead	0.0T	0.0T	2	4	1,061 mm [ ]
ETC272	28mm Square Bead	0.0T	0.0T	2	4	1,301 mm [ ]
ETC614	70mm square Outerframe	45.0T	45.0T	2	4	1,250 mm [ ]
ETC614	70mm square Outerframe	45.0T	45.0T	2	4	1,459 mm [ ]
ETC623	Internally Glazed Chamfered Vent	-45.0T	-45.0T	2	4	1,191 mm [ ]
ETC623	Internally Glazed Chamfered Vent	-45.0T	-45.0T	2	4	1,400 mm [ ]
Glazing			Qty	Total	Width	Height
28MM	28mm Glazing		1	2	1,293	1,084 [ ]
Components			Qty	Total	Unit	
ACET011	CornerCleit (Mechanical for 55)		8	16	Each [ ]	
ACET044	Chevron S/S (for 55)		12	24	Each [ ]	
ACET060	Screws (for screwports) No. 6 x 1		8	16	Each [ ]	
ACET062	Screws (for Cills) No.10 x 2 CskSS STap		6	12	Each [ ]	
ACET064	Screws (for Handles) No. 8 X5/8 Csk Hd.		12	24	Each [ ]	
ACET068	Screws No.8 x 3/8 Flange Head		12	24	Each [ ]	
ACET069	Screws (for ACET081)		2	4	Each [ ]	
ACET157WP	Cill end cap		1	2	Each [ ]	
ACET165WPR	Espag Handle Right - White		1	2	Each [ ]	
ACET604L	Trojan Rev' Espag'		1	2	Each [ ]	
ACET604R	Trojan Rev' Espag'		1	2	Each [ ]	
ACET605R	Trojan Rev' Espag'		1	2	Each [ ]	
ACET680	Riser Block		2	4	Each [ ]	
ACET841	Low Line Gasket Captive for ali300		5	10	Each [ ]	
ACETDHS24	FrictionStay 24" top hung (16mmStack)		1	2	Each [ ]	
ACVL032	Gasket - Small Flipper		10	21	Each [ ]	
ACW20034	4mm Wedge Gasket		5	10	Each [ ]	
HINGE PROTE	(Hinge Protectors (Pr		2	4	Each [ ]	
WCA106SSZ	Aluminium Corner Chevron (Large)		12	24	Each [ ]	