

Evidence of Performance

Resistance to wind load



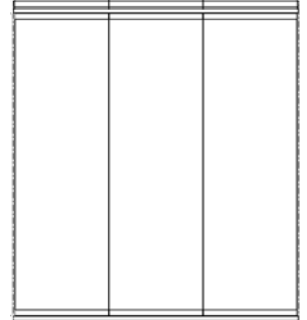
Test Report 106 33942e

This is a translation of Test Report 106 33942 dated 9 July 2007

Client **SUNFLEX Aluminiumsysteme GmbH**
Im Ruttenberge 12

57482 Wenden-Gerlingen

Representation



Product/ Construction product	Balcony glazing with sliding side-hung casements
Designation	SF 25
Frame material	Aluminium EN AW-6063 T5
Special features	The test specimens were not openable.

Instruction for use

This test report serves to demonstrate resistance to static wind loads.

	Specimen 1	Specimen 2
Overall dimensions (W x H) in mm	2200 x 2500	2200 x 2500
Glazing	TSG-H, 8 mm	TSG-H, 10 mm
Resistance to static wind load no failure at up to		
	2200 Pa	3900 Pa

Validity

The data and results refer solely to the tested and described specimen.

The present test does not allow any statement to be made on any further characteristics regarding performance and quality, in particular the effects of weathering and ageing. Any pre-existing defects of the TSG glazing have not been taken into account.

Notes on publication

The **ift**-Guidance Sheet "Guidance and Conditions for the Use of **ift** Test Documents" applies."

ift Rosenheim
6 August 2007

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1 Object

1.1 Description of test specimen

Construction product	Balcony glazing
Manufacturer	SUNFLEX Aluminiumsysteme GmbH
Profile system	SF 25
Construction	Three casements, sliding side-hung casement, non-openable
Overall dimensions (W x H)	2200 mm x 2500 mm
Casement size (W x H)	Casement left: 722 mm x 2358 mm Casement centre: 721 mm x 2358 mm Casement right: 722 mm x 2358 mm

Specimen 1

Glazing Toughened safety glass TSG -H, 8 mm, ground edges

Specimen 2

Glazing Toughened safety glass TSG -H, 10 mm, ground edges

Slide rails

Material Aluminium

Profiles Bottom: Bottom rail, Item No. SF250010

Top: Top rail, Item No. SF250009

Top: Height compensation profile, Item No. SF250011

Additional parts

Internal and external brush seals in top rail;

Top rail connected to height compensation profile through 3 M8 central fixtures (A2) and M8 screws (A2),

Plastic end caps for top and bottom rail

Further details

See drawings and Figures under Clause 1.2

Fitting of pane

Support

Glass panes: linear support on two edges (top and bottom) by two aluminium profiles, additionally secured with 2 M8 (A2) bolts each, with plastic spacer sleeve and plastic spacer with clip function (polyamide); pane bonded to casement profile with double-sided adhesive mirror tape, on the opposite side two mirror tape sections as spacers for cover section;

Profiles

Bottom: casement profile Item No. SF250008 with cover section Item No. SF250007

Top: casement profile Item No. SF250008 with cover section Item No. SF250007

Additional parts

Casement profile: at bottom internal and external brush seal,

Casement profiles. plastic end caps,

Vertical external edges of outer panes: plastic push-on plastic section with engaged sealing fin

Further details

See drawings and Figures under Clause 1.2

Hardware

Sliding side-hung case-
ment

Bottom: 2 runners with pivoted ball bearing bolted to casement profile via support plate (A2) and M8 (A2) screw ,
Top: 2 guide runners bolted to casement profile via support plate (A2) and M8 (A2) screw

Further details See drawings and Figures under Clause 1.2

The description is based on inspection of the test specimens at the **ift**. Item designations/numbers as well as material specifications were given by the client.

1.2 Representation of test specimen

The constructional details were checked for the characteristics to be classified.

The photographs were taken at the **ift** during testing. The drawings are based on unchanged documentation provided by the client.

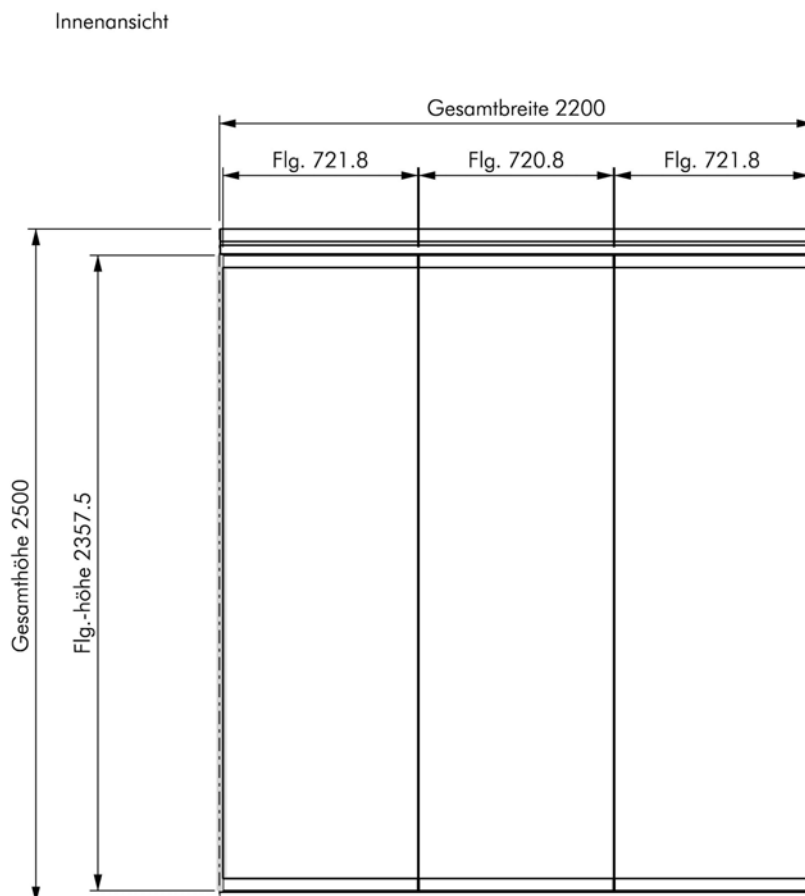


Fig. 1 View of test specimen 1 and 2

Vertikalschnitt: SF 25 (8 mm-Glas)

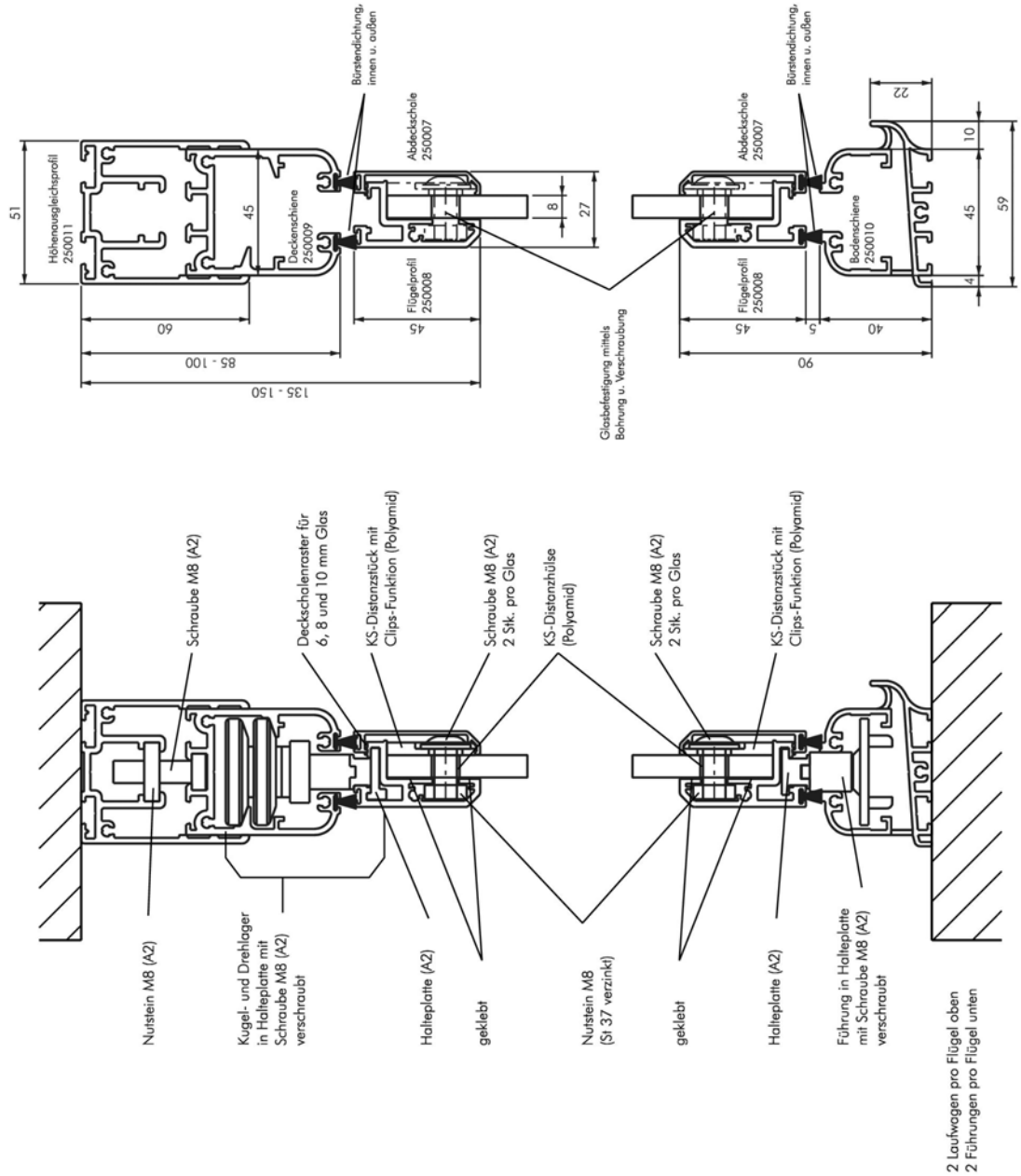


Fig. 2 Vertical section of test specimen 1

Vertikalschnitt: SF 25 (10 mm-Glas)

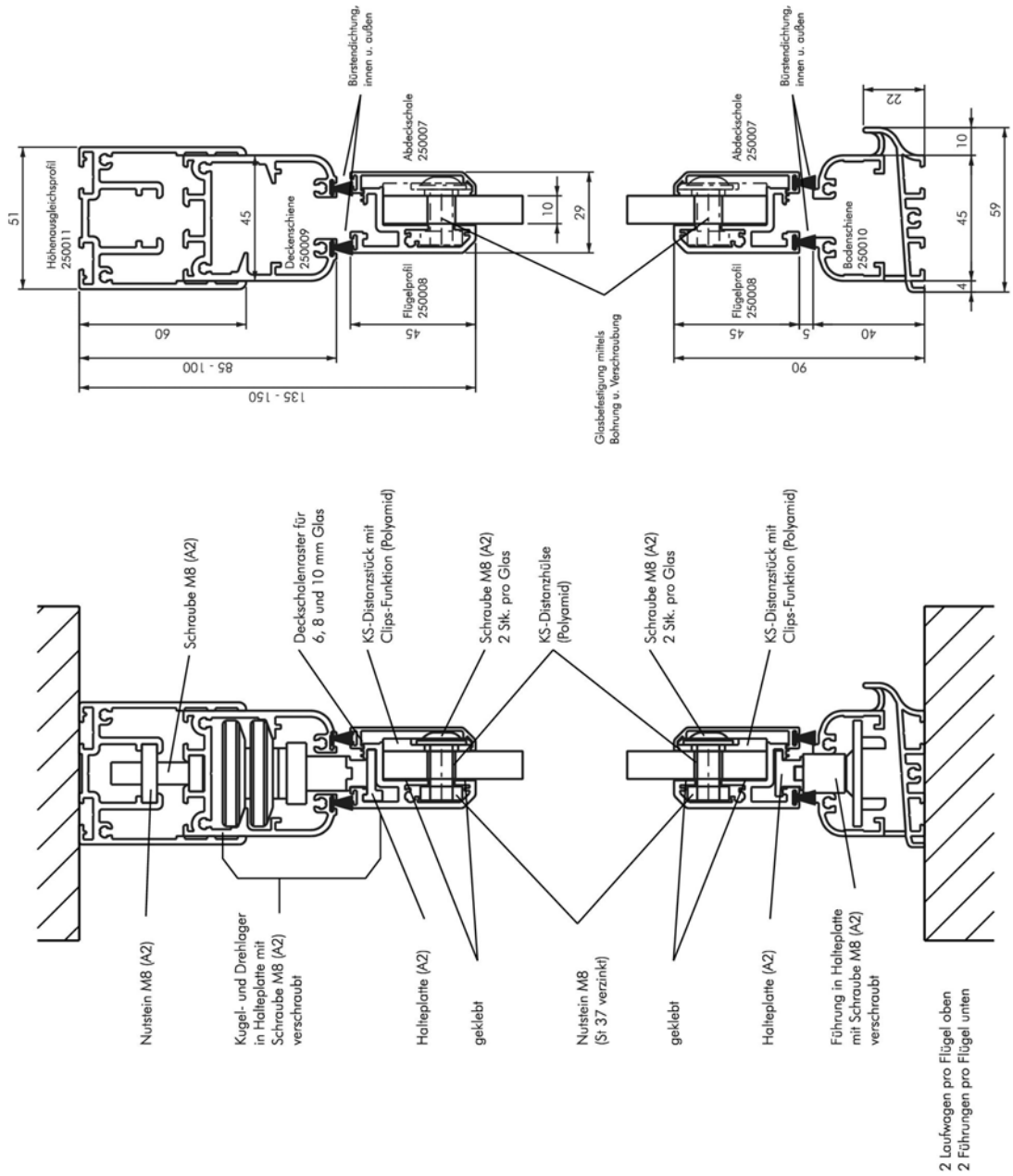


Fig. 3 Vertical section of test specimen 2

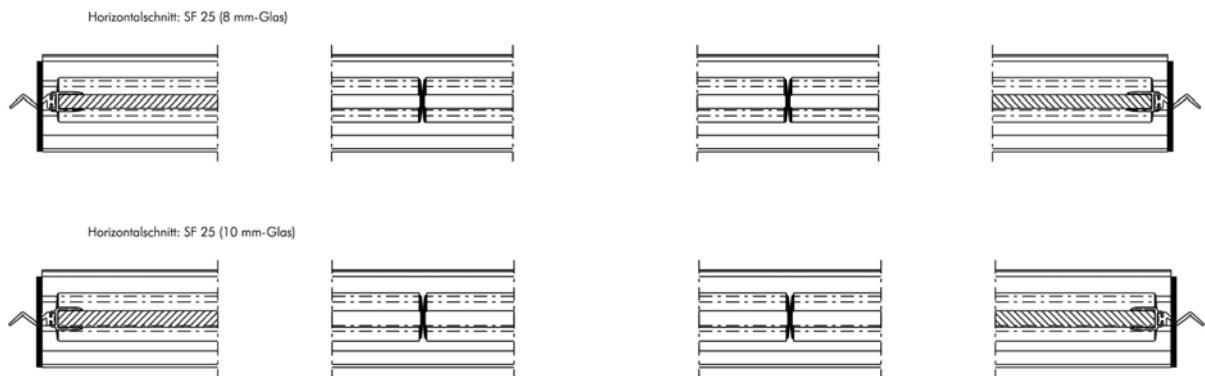


Fig. 4 Horizontal section of test specimen 1 and 2



Fig. 5 Top rail in height compensation-profile (without end cap)



Fig. 6 Bottom rail (without end cap)



Fig. 7 Fixing of height compensation profile with top rail

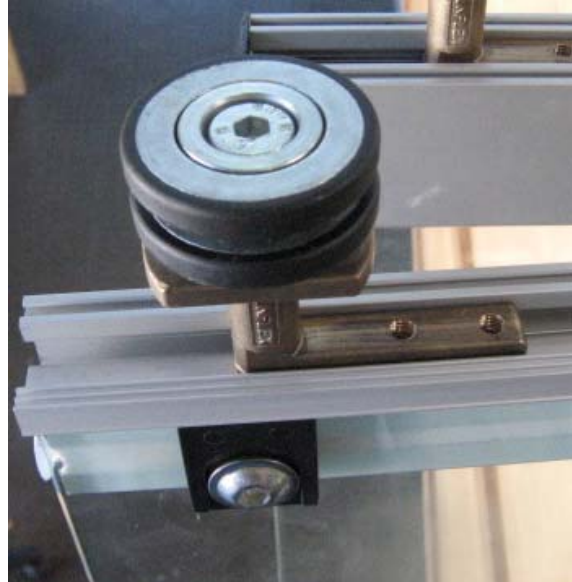


Fig. 8 Top runner (left and right)



Fig. 9 Bottom guide runner (left and right)



Fig. 10 Support of pane (cover section removed)



2 Procedure

2.1 Sampling

The samples were selected by the client.

Number	2
Manufacture	June 2007
Delivered	25 June 2007 by the client
Registration No.	22143/001 and 002

2.2 Test equipment

Window test bench	Device No.: 22200
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2.3 Testing

Date/Period	25 June 2007
Test engineer	Wolfgang Jehl, Dipl.-Ing. (FH)

3 Description of the test

3.1 Static wind load test

The test specimens were exposed to static wind load. For testing the test specimens were mounted to the window and facade test rig of the **ift** Rosenheim. For application of static pressure a film with sufficient freedom of movement was fixed between test chamber and test specimen.

The test pressure (positive pressure on external face) was increased every 30 seconds in 100 steps up to the maximum test pressure differential. Deformation of one glazed panel (deflection) was determined.



Fig. 11 Test setup for static wind load

4 Results

4.1 Static wind load test

The test specimens with non-openable casements passed the static wind load test when exposed to the static pressures listed in the following:

Table 1 Results of exposure to static wind loads

	Size of test specimen	Glazing ESG-H	Static pressure
			Positive pressure on external face ¹⁾
Specimen 1	2200 x 2500 mm ²	8 mm	2200 Pa
Specimen 2	2200 x 2500 mm ²	10 mm	3900 Pa

¹⁾ The specimen submitted was tested to the more unfavourable case so that the values referring to negative pressure on the external face can be extrapolated.

No damage, glass breakage, material breakage, etc. were detected on the element. Detailed results are given in the test record (Annex to test report).

4.2 Validity of the test results

The data listed in this test report refer exclusively to the objects described and tested under Item 2.

4.3 Extrapolation of test results

The measured results were obtained from the product in new condition. Thus they do not include any changes that are likely to be caused by the effects of weathering and/or ageing or any pre-existing defects of the toughened safety glazing (TSG-H).

The test results obtained may be extrapolated to constructions of identical or smaller dimensions of the same design and type of rebate provided that consistent quality of workmanship is guaranteed by suitable control measures, and the material used as well as the make comply with the description of this test report.

ift Rosenheim
24 July 2007

Test record 1

Three casement balcony glazing 8 mm TSG-H

Project number	106 33942
Client / contact	SUNFLEX Aluminiumsysteme GmbH
Element	3 casement balcony glazing
Manufacturer	Jun. 07
Date of test	25.06.2007
Attended by	Mr Schneider

System	SUNFLEX SF 25			Element-or.	1
Frame material	Aluminium			Specimen-No.	22143/001
Size of element	2200	x	2500	mm	innen
Casement size l.	721,8	x	2357,5	mm	
Casement size m.	720,8	x	2357,5	mm	
Casement size r.	721,8	x	2357,5	mm	
Temperature					25 °C
Air humidity					51%

3 sliding side-hung casements, non-openable

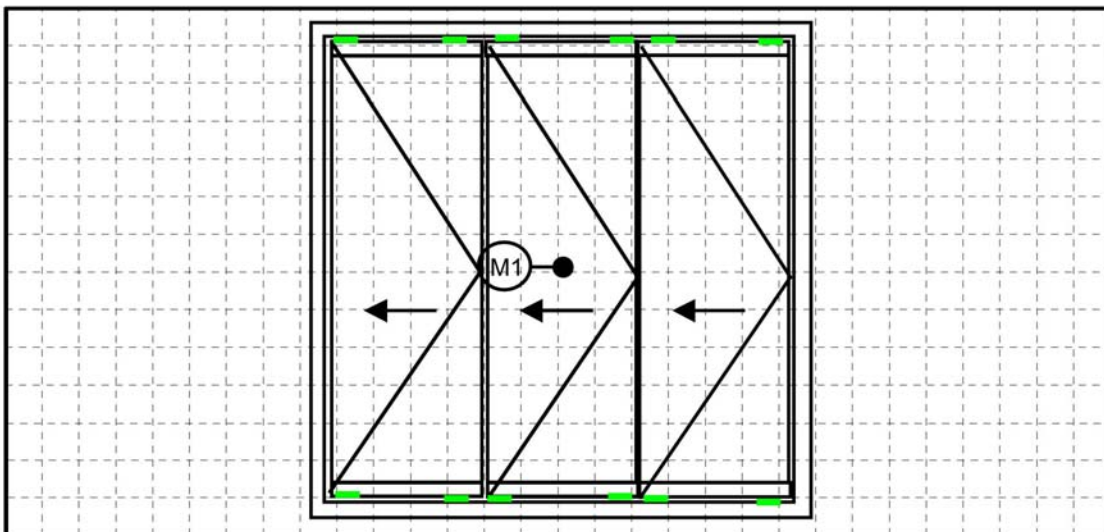


Fig. 1 View of specimen

Key		Hinges/bearings
		Locks
		Measurement points - deflection

Static wind load test

External pressure, minimum load time per pressure step 30 sec.

Distance without load 468 mm

negative pressure	Construction			Observations
100 Pa	455	13	mm	no changes to the element
200 Pa	441	27	mm	no changes to the element
300 Pa	429	39	mm	no changes to the element
400 Pa	415	53	mm	no changes to the element
500 Pa	402	66	mm	no changes to the element
600 Pa	389	79	mm	no changes to the element
700 Pa	381	87	mm	no changes to the element
800 Pa	375	93	mm	no changes to the element
900 Pa	370	98	mm	no changes to the element
1000 Pa	362	106	mm	no changes to the element
1100 Pa	352	116	mm	no changes to the element
1200 Pa	346	122	mm	no changes to the element
1300 Pa				no changes to the element, no measurement
1400 Pa				no changes to the element, no measurement
1500 Pa	325	143	mm	no changes to the element
1600 Pa				no changes to the element, no measurement
1700 Pa				no changes to the element, no measurement
1800 Pa				no changes to the element, no measurement
1900 Pa				no changes to the element, no measurement
2000 Pa				no changes to the element, no measurement
2100 Pa				no changes to the element, no measurement
2200 Pa				no changes to the element, no measurement
2300 Pa				Unit is drawn out completely from height compensation profile at top; height compensation profile deformed; no glass breakage



Fig. 1 Top rail drawn out from height compensation profile at 2300 Pa, height compensation profile deformed.



Fig. 2 and 3 Cause of failure, aluminium profile torn out around screw heads

ift Rosenheim
25 June 2007

Test record 2

Three casement balcony glazing 10 mm TSG-H

Project number	106 33942
Client / contact	SUNFLEX Aluminiumsysteme GmbH
Element	3 casement balcony glazing
Manufacture	Jun. 07
Date of test	25.06.2007
Attended by	Mr Schneider

System	SUNFLEX SF 25			Element-No.	1
Frame material	Aluminium			Specimen No.	22143/002
Size of element	2200	x	2500	Test engineer	Jehl
Casement size l.	721,8	x	2357,5		internal
Casement size m.	720,8	x	2357,5	Temperature	25 °C
Casement size r.	721,8	x	2357,5	Air humidity	51%

3 sliding side-hung casements, non-openable

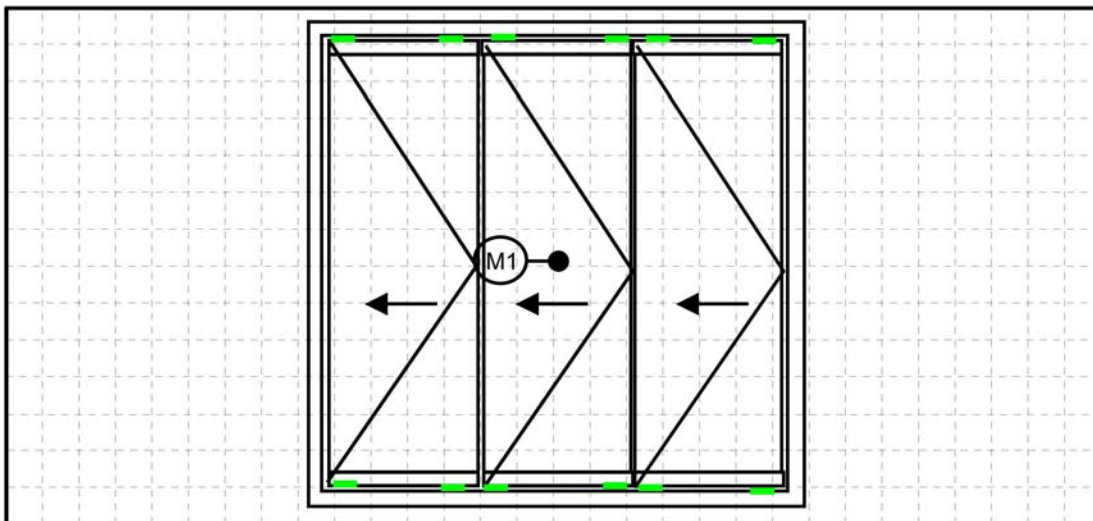


Fig. 1 View of specimen





Static wind load test

Element 2

External pressure, minium load time per pressure step 30 sec.

Distance without load: 463 mm

poitive pressure		Constructions			Observations
100	Pa	456	7	mm	no changes to the element
200	Pa	449	14	mm	no changes to the element
300	Pa	442	21	mm	no changes to the element
400	Pa	435	28	mm	no changes to the element
500	Pa	428	35	mm	no changes to the element
600	Pa	420	43	mm	no changes to the element
700	Pa	413	50	mm	no changes to the element
800	Pa	406	57	mm	no changes to the element
900	Pa	399	64	mm	no changes to the element
1000	Pa	391	72	mm	no changes to the element
1100	Pa	384	79	mm	no changes to the element
1200	Pa	378	85	mm	no changes to the element
1300	Pa				no changes to the element, no measurement
1400	Pa				no changes to the element, no measurement
1500	Pa	360	103	mm	no changes to the element
1600	Pa				no changes to the element, no measurement
1700	Pa				no changes to the element, no measurement
1800	Pa				no changes to the element, no measurement
1900	Pa				no changes to the element, no measurement
2000	Pa				no changes to the element, no measurement
2100	Pa				no changes to the element, no measurement
2200	Pa				no changes to the element, no measurement
2300	Pa				no changes to the element, no measurement
2400	Pa				no changes to the element, no measurement
2500	Pa				no changes to the element, no measurement
2600	Pa				no changes to the element, no measurement
2700	Pa				no changes to the element, no measurement
2800	Pa				no changes to the element, no measurement
2900	Pa				no changes to the element, no measurement
3000	Pa				no changes to the element, no measurement
3100	Pa				no changes to the element, no measurement
3200	Pa				no changes to the element, no measurement
3300	Pa				no changes to the element, no measurement
3400	Pa				no changes to the element, no measurement
3500	Pa				no changes to the element, no measurement
3600	Pa				no changes to the element, no measurement
3700	Pa				no changes to the element, no measurement
3800	Pa				no changes to the element, no measurement
3900	Pa				no changes to the element, no measurement
4000	Pa				Unit jumps out at top from height compensation profile; right-hand pane breaks when hitting the timber block; height compensation profile deformed;



Fig. 1 Top rail drawn out from height compensation profile at 4000 Pa, height compensation profile deformed, right-hand pane broken when hitting the test rig, cover sections disengaged.



Fig. 2 Cause of failure, break-outs at Aluminium profile around screws.



Fig. 3 Guide runners permanently deformed