

# Evidence of Performance

Air permeability, Watertightness, Resistance to wind load



## Test Report

No. 12-002329-PR01

(PB-A01-02-en-01)

**Client** ALUMIL S.A.  
Industrial Area  
61100 Kilkis  
Greece

**Product** Double lifting sliding door

**Designation** System designation: S700

**Performance-relevant product details** Material: Aluminium profiles with thermal break

**Overall dimensions (WxH)** 2,590 mm x 2,390 mm

**Special features** Construction with room-side visible flow condition  
The Guideline of the Glaserhandwerk "TR 03 Setting blocks of glazing units" shall be observed.

### Basis

EN 14351-1:2006+A1:2010

Test standards:

EN 1026:2000-06

EN 1027:2000-06

EN 12211:2000-06

Test Report 12-002329-PR01  
(PB-A01-02-de-01) dated  
29.11.2012

Corresponds to the national versions  
(e. g. DIN EN)

### Representation



### Results

Air permeability according to EN 12207:1999-11



**Class 4**

Watertightness according to EN 12208:1999-11



**Class 9A**

Resistance to wind load  
according to EN 12210:1999-11/AC:2002-08



**Class C3/B4**

### Instructions for use

The results obtained can be used by the manufacturer as the basis for the manufacturer ITT test report summary. Observe the specifications set out by the applicable product standard.

### Validity

The data and results refer solely to the tested and described specimen. Classification remains valid as long as the product and the above basis remain unchanged. The results can be extrapolated under the manufacturer's own liability subject to observance of the relevant specifications set out by the applicable product standard. This test/evaluation does not allow any statement to be made on any further characteristics regarding performance and quality of the construction presented, in particular the effects of weathering and ageing were not taken into account.

### Notes on publication

The ift-Guidance Sheet "Advertising with ift test documents" applies. The cover sheet can be used as an abstract.

The report contains a total of 28 pages.

ift Rosenheim

17.06.2013

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Operating Testing Officer  
Tightness & Wind Load



## 1. Object

### 1.1 Description of test specimen

#### Double lifting sliding door

Manufacturer	ALUMIL S.A., - Kilkis
System designation	S700
Material	Aluminium profiles with thermal break
Type of opening	lifting sliding
Opening directions	Right casement prior left casement

#### Frame member

Designation / Type / Item No.	S70702
Overall dimensions in mm	2,590 mm x 2,390
Isolator	313 12 020 00
Type of joint	mitred, bonded and nailed

#### Additional profile

Designation / Type / Item No.	groove cover profile 660.00.702.00
Material	Plastic - PVC
Fixing	clamped, sealed with sealing profile 240.00.312.01
Corner design	mitred and bonded
Position	4-sided between both casements

#### Weather protection profile

Designation / Type / Item No.	S70753
Material	Aluminium
Type of joint	bolted and sealed with pourable sealant
Corner design	butt-jointed
Position	external at top

#### Casement member

Designation / Type / Item No.	S70706
Overall dimensions in mm	1,277 mm x 2,307 mm
Isolator	313.12.040.00
Type of joint	mitred, bonded and nailed
Weight in kg	121

#### Central meeting joint

Designation / Type / Item No.	Cover profile S70707, Aluminium Central meeting joint profile 660.00.704.00, PVC
Type of joint	at end caps 311.03.704.03 butt-jointed, bolted and sealed with pourable sealant
Fixing	clamped and bolted

#### Rebate design

Rebate drainage	via drillings groove cover profile and 6 slots in frame with cover caps 311.00.452.XX,
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	<p>drillings in groove cover profile:</p> <p>in outside area, 5 drillings Ø 8 mm in cover profile and 5 staggered drillings Ø 8 mm in frame</p> <p>in inside area, 5 drillings Ø 8 mm in cover profile and 5 staggered drillings Ø 8 mm with bullet profile 660.12.009.03 in frame</p> <p>internal channels in frame 2 drillings Ø 8 mm forward under the groove cover profile</p>
Pressure equalization	in frame lateral at top each 2 slots with cover cap 720.65.017.XX
<b>Casement seal internal and external</b>	
Designation / Type / Item No.	on lock side and at bottom: 240.70.002.03 at top: 240.70.001.03
Material	Sealing material - EPDM
Corner design	with shaped corner pieces bonded
<b>Seal central meeting joint</b>	
Designation / Type / Item No.	at central meeting joint profile: ea. 3 brush seals 620.69.107.XX and 1 sealing profile 240.00.462.01 (EPDM)
Material	Sealing material
Special features	in frame at bottom with sealing plate 660.02.702.03, at top with sealing cushion 660.01.702.03, bolted and sealed with pourable sealant
	in casement at bottom with EPDM seal 311.04.704.03, at top with foam seal 311.05.704.03
Corner design	butt-jointed
Additional procedure	with pourable sealant sealed
<b>Seal internal</b>	
Designation / Type / Item No.	brush seal 620.69.108
Material	Sealing material
Corner design	mitred
<b>IGU triple</b>	
Thickness in mm	34
Configuration in mm	5 / 10 SZR / 4 / 10 SZR / 5
<b>Incorporation of infill panel</b>	
Special features	insulating profile 313.10.030.00 in glazing rebate
Vapour pressure equalization	no vapour pressure equalization existent
<b>Glazing gasket external</b>	
Designation / Type / Item No.	200.70.005.03
Material	Sealing material - EPDM
Corner design	mitred and bonded



Additional procedure	Seal with pourable sealant bonded with the pane
<b>Glazing gasket internal</b>	
Designation / Type / Item No.	200.08.003.01
Material	Sealing material - EPDM
Corner design	at corners continuous, at top centre butt-jointed
<b>Glazing bead</b>	
Designation / Type / Item No.	S70708
Special features	with sealing profile 220.11.449.12
Type of joint	butt-jointed
Fixing	clamped
<b>Lifting sliding hardware</b>	
Manufacturer	Gretsch-Unitas GmbH, Baubeschlage - Ditzingen
Designation / Type / Item No.	GU 934
Special features	On lock side form closure by profiling
Type of opening	lifting sliding
Opening directions	right casement prior left casement
Hinges / Bearings	each casement 2 roller
Number of locks	each casement on lock side 1
Locking distance, max. in mm	-
Position of locks	neutral

The description is based on information provided by the client and inspection of the test specimen at the ift (item designations / numbers as well as material specifications were provided by the client unless stated "ift-checked").

Test specimen representations are documented in the Annex "Representation of product/test specimen". The design details were examined solely on the basis of the characteristics / performance to be classified. The drawings are based on unchanged documentation provided by the client unless stated otherwise; the photographs were taken by the ift Rosenheim unless stated otherwise.

## 1.2 Sampling

The below sampling data were provided to the ift:

Sampling by:	ALUMIL S.A., 61100 Kilkis (Greece), Giannis Tsolakis
Date:	20.09.2012
Verification:	A sampling report has been provided to the ift.
Delivered on:	08.10.2012
ift-sp-Number:	12-002329-PK01 / WE: 33289-003



## **2. Procedure**

### **2.1 Basis \*) referring to methods**

#### **Testing**

EN 1026:2000-06

Windows and doors - Air permeability - Test method

EN 1027:2000-06

Windows and doors - Watertightness - Test method

EN 12211:2000-06

Windows - Determination of the resistance to static torsion

#### **Classification / Evaluation**

EN 12207:1999-11

Windows and doors - Air permeability - Classification

EN 12208:1999-11

Windows and doors - Watertightness - Classification

EN 12210:1999-11/AC:2002-08

Windows and doors - Resistance to wind load - Classification

\*) and the equivalent national versions, e. g. DIN EN

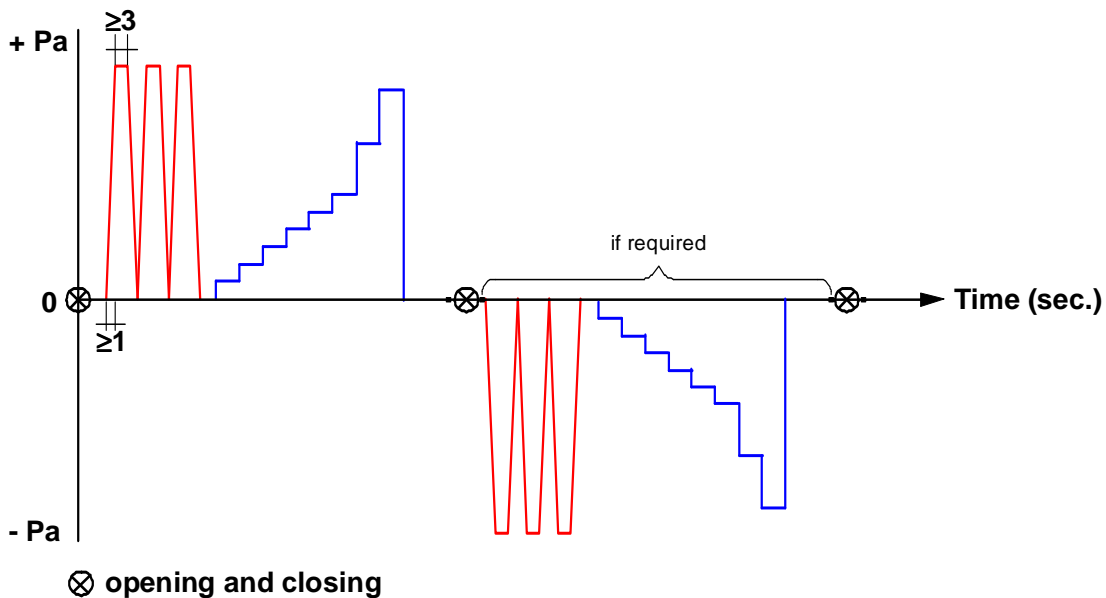


## 2.2 Brief description of procedure

### Air permeability - EN 1026

Prior to testing, the operating forces are determined as per EN 12046-1 for the release / locking operation of the hardware.

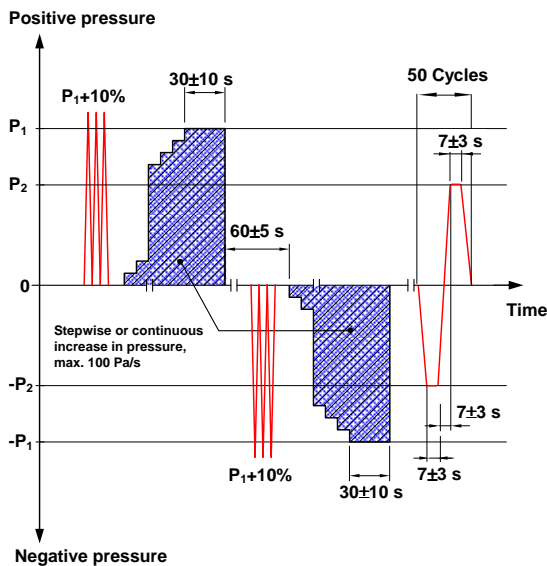
Air permeability is tested in accordance with EN 1026 and conducted in steps at negative pressure and positive pressure up to the maximum test pressure difference. Leakages of the test set-up are made visible using artificially generated fog and sealed using permanently resilient sealant. The test specimen is exposed to three pressure pulses  $\Delta p_{max} + 10\%$  or at least 500 Pa. This is followed by measurement of air permeability for the respective pressure steps.



**Illustration** Test sequence for air permeability

Resistance to wind load - Deflection and alternating negative/positive pressures - EN 12211

Resistance to wind load is tested in accordance with EN 12211 and conducted in steps at negative pressure and positive pressure up to the test pressure  $p_1$ . The test specimen is exposed to three pressure pulses  $\Delta p_1 + 10\%$ . This is followed by determination of the frontal deflection of test specimen for each pressure step when exposed to positive test pressure  $\Delta p_1$  and negative test pressure  $\Delta p_1$ . Then the test specimen is subjected to 50 cycles including negative and positive pressures of  $\pm \Delta p_2 = \Delta p_1 - 50\%$ .



**Illustration** Test sequence for resistance to wind load



Air permeability – Repeat test - EN 1026

Following resistance to wind load test for  $p_1$  (deflection) and  $p_2$  (alternating positive/negative pressure), air permeability must not exceed by more than 20% the upper limit of the specified class as set out by EN 12207.

Watertightness - EN 1027

Watertightness is tested in accordance with EN 1027 up to the maximum test pressure difference. The external face of the test specimen is subjected to constant spraying of water by an upper row of nozzles at a flow rate of approx. 2 l/min per nozzle while increments of positive test pressure are applied at regular intervals. For test specimen exceeding 2.50 m in overall height, additional rows of nozzles are fixed at vertical intervals at 1.5 m below the top nozzle line. The water flow rate of the additional nozzle rows is approx. 1 l/min per nozzle.

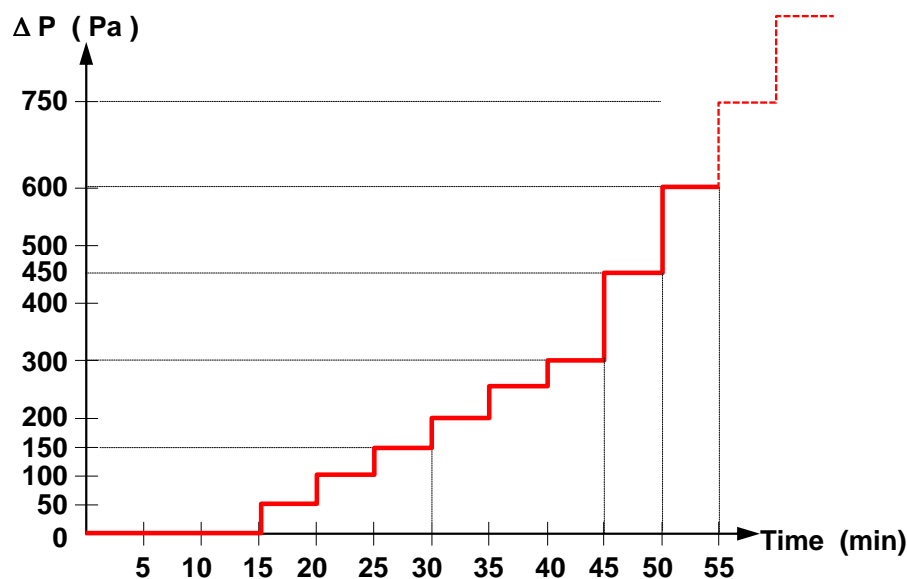


Illustration Test sequence for watertightness

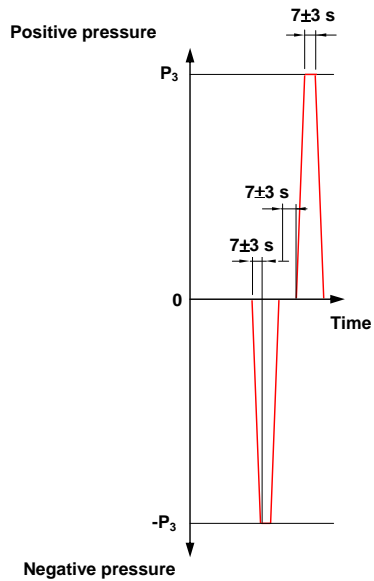
**Evidence of Performance**

Air permeability, Watertightness, Resistance to wind load  
Test Report 12-002329-PR01 (PB-A01-02-en-01) dated 17. Juni 2013  
Client ALUMIL S.A., 61100 Kilkis (Greece)



Resistance to wind load – Safety test - EN 1211

The wind resistance test (safety test) is conducted at negative pressure and positive pressure in accordance with EN 12211 up to test pressure  $\Delta p_3 = p_1 + 50\%$ .



**Illustration** Test sequence for safety test

### 3. Detailed results

#### Operating forces - Test according to 12046-1

Project No.	12-002329-PR01	Task No.	12-002329
Client	ALUMIL S.A.		
Basis of test	EN 12046-1:2003-11 Operating forces - Test method - Part 1: Windows		
Used test equipment	KM/022960 - Digitales Kraftmessgerät 200N		
Test specimen	Sliding door scheme D1 mit 2,3m high		
Test specimen No.	33289-003		
Date of test	09.10.2012		
Testing personnel in charge	Thomas Stefan		
Test engineer	Thomas Stefan		

#### Information to test configuration / Test method

Test method There are no deviations to the test method according standard/basis.

Ambient conditions Temperature 22 °C Air humidity 48,9 %

The ambient conditions are in accordance with the standard requirements.

#### Testing

Pivot arm  m

**Table:** Measurement operating forces for the release / locking operating

Measured values	1	2	3	Average value M
in N	82,2	79,4	81,8	81,1

**Table:** Measurement of force required for opening (sliding)

Measured values	1	2	3	Average value M
in N	91,6	87,7	92,3	90,5

**Table:** Measurement of force for complete closing (sliding)

Measured values	1	2	3	Average value M
in N	87,6	84,5	87,3	86,5

#### Malfunctions at test specimen

At the test specimen were no malfunctions detected.

**Air permeability - Test according to EN 1026**

Project No. 12-002329-PR01 Task No. 12-002329  
 Client ALUMIL S.A.  
 Basis of test EN 1026:2000-06  
 Windows and doors - Air permeability - Test method

Used test equipment Pst/022200 - LWW-Prüfstand Fensterprüfstand 1  
 Test specimen Sliding door scheme D1 mit 2,3m high

Test specimen No. 33289-003  
 Date of test 09.10.2012  
 Testing personal in charge Thomas Stefan  
 Test engineer Thomas Stefan

**Information to test configuration / Test method**

Test method There are no deviations to the test method according standard/basis.

Ambient conditions Temperature 22 °C Air humidity 48,9 % Air pressure 967,2 hPa

The ambient conditions are in accordance with the standard requirements.

**Testing**


Size of window frame 2590 mm x 2390 mm  
 Size of active casement 1310 mm x 2307 mm  
 Size of inactive casement 1202 mm x 2307 mm  
 Area of test specimen 6,19 m<sup>2</sup>  
 Length of opening joints 11,95 m

**Table: Measurement of operating forces**


Individual measured result	1	2	3	Average value
in Nm	62,8	69,0	64,7	65,5

Initial load before positive wind pressure and negative wind pressure respectively: 660 Pa

**Table: Air permeability at positive wind pressure**

Measured results at positive wind pressure 	Pressure differential in Pa	50	100	150	200	250	300	450	600
	Flow rate (volume) m <sup>3</sup> /h	1,2	2,5	3,3	3,9	4,4	4,8	6,0	7,3
	Joint length-related m <sup>3</sup> /hm	0,10	0,21	0,28	0,33	0,37	0,40	0,50	0,61
	Overall area-related m <sup>3</sup> /hm <sup>2</sup>	0,20	0,40	0,53	0,63	0,71	0,78	0,97	1,18

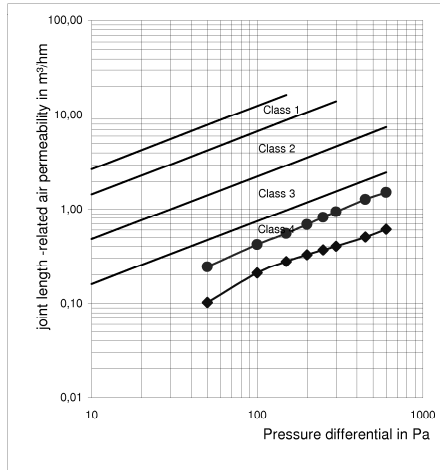
**Table: Air permeability at negative wind pressure**

Measured results at negative wind pressure 	Pressure differential in Pa	50	100	150	200	250	300	450	600
	Flow rate (volume) m <sup>3</sup> /h	2,9	5,0	6,6	8,2	9,8	11,3	15,2	18,1
	Joint length-related m <sup>3</sup> /hm	0,24	0,42	0,55	0,69	0,82	0,94	1,27	1,52
	Overall area-related m <sup>3</sup> /hm <sup>2</sup>	0,47	0,81	1,06	1,33	1,58	1,82	2,46	2,92

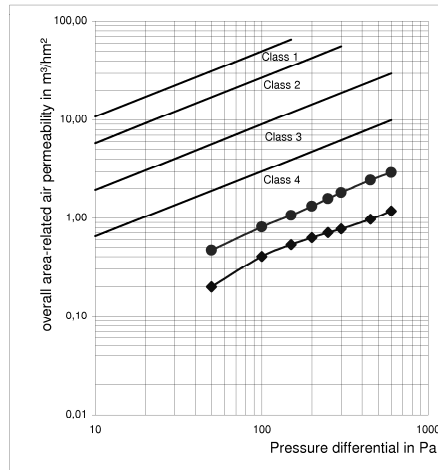


**Table: Air permeability from average values from positive and negative wind pressures**

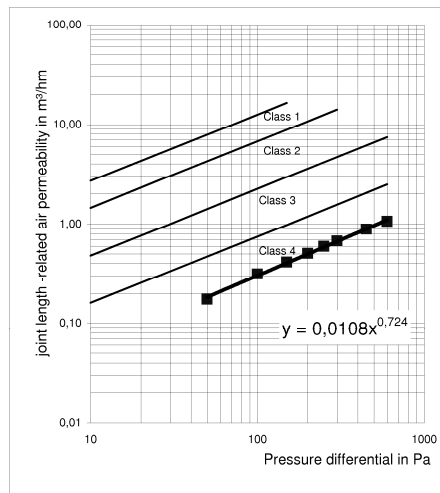
Average value from positive and negative wind pressures	Pressure differential in Pa	50	100	150	200	250	300	450	600
Flow rate (volume)	m <sup>3</sup> /h	2,1	3,8	4,9	6,1	7,1	8,0	10,6	12,7
Joint length-related	m <sup>3</sup> /hm	0,17	0,31	0,41	0,51	0,59	0,67	0,89	1,06
Overall area-related	m <sup>3</sup> /hm <sup>2</sup>	0,33	0,61	0,80	0,98	1,15	1,30	1,71	2,05



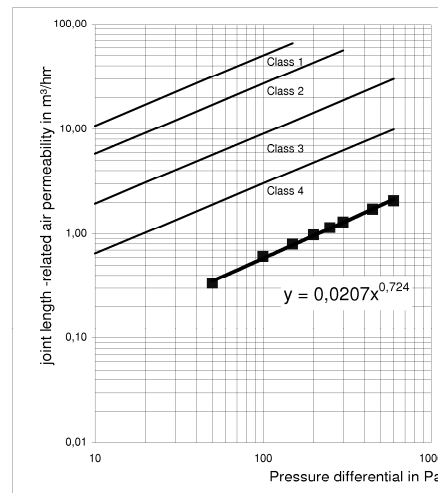
**Diagram:** Joint length-related air permeability (positive and negative wind pressures)



**Diagram:** Overall area-related air permeability (positive and negative wind pressures)



**Diagram:** Joint length-related air permeability (average value from positive and negative wind pressures)



**Diagram:** Overall area-related air permeability (average value from positive and negative wind pressures)

**Table: Measured results**

Reference air permeability related to joint length	Q100 =	0,30 m <sup>3</sup> /hm
Reference air permeability related to overall area	Q100 =	0,58 m <sup>3</sup> /hm <sup>2</sup>

**Resistance to wind load, deflection and dynamic wind load-  
 Test according to EN 12211**

<b>Project No.</b>	12-002329-PR01	<b>Task No.</b>	12-002329
<b>Client</b>	ALUMIL S.A.		
<b>Basis of test</b>	EN 12211:2000-06 Windows and doors - Resistance to wind load - Test method		
<b>Used test equipment</b>	Pst/022200 - LWW-Prüfstand Fensterprüfstand 1		
<b>Test specimen</b>	Sliding door scheme D1 mit 2,3m high		
<b>Test specimen No.</b>	33289-003		
<b>Date of test</b>	09.10.2012		
<b>Testing personal in charge</b>	Thomas Stefan		
<b>Test engineer</b>	Thomas Stefan		

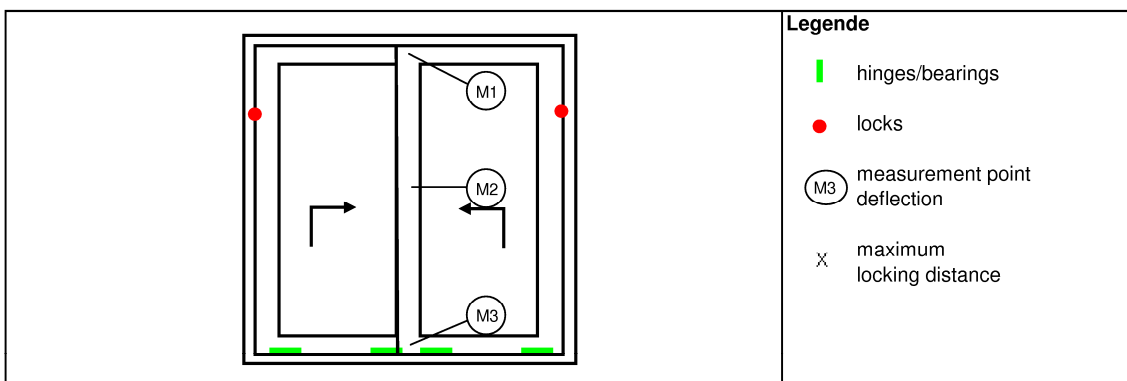
**Information to test configuration / Test method**

**Test method** There are no deviations from the test method according standard/basis.

**Ambient conditions** Temperature 22 °C Air humidity 48,9 % Air pressure 967,2 hPa

The ambient conditions are in accordance with the standard requirements

**Testing**



Maximum test pressure:  $\pm$  1600 Pa 3 pressure pulses of 1760 Pa

**Table:** Maximum deflection for classification at effective span  $l =$  2307 mm

Class		Maximum permissible relative deflection in mm
A	( $l/150$ )	15,4
B	( $l/200$ )	11,5
C	( $l/300$ )	7,7

**Table:** Measured results of frontal deflection in mm at negative / positive wind pressure

Measured results of frontal deflection in mm	$p_1$ in Pa	Positive wind pressure					Negative wind pressure				
		400	800	1200	1600	2000	-400	-800	-1200	-1600	-2000
M1 in mm				2,7	3,4				-3,4	-4,0	
M2 in mm				8,5	11,6				-8,8	-11,7	
M3 in mm				1,8	2,6				-1,8	-2,6	
$f_{rel}$ in mm				6,3	8,6				-6,2	-8,5	
$l/f_{rel}$				367	269				374	272	

**Table:** Permanent deformation measured at 90 Pa after 60 seconds

Permanent deflection		Pos.pr	Neg.pr
		M1 in mm	0,1
M2 in mm		0,2	-0,2
M3 in mm		0,1	0,0
$f_{rel}$ in mm		0,1	-0,1

#### Key

$p_1$  Test pressure  
M1, M2, M3 frontal dislodgement at measurement points M1, M2, M3  
 $f$  frontal deflection

#### Dynamic wind loads (negative / positive pressures)

**Table:** pressure pulses

$p_2$ in Pa	200	400	600	800	1000
passed				✓	

50 cycles at  $p_2 \pm$  800 Pa

No malfunctions were detected

Air permeability, Watertightness, Resistance to wind load

Test Report 12-002329-PR01 (PB-A01-02-en-01) dated 17. Juni 2013

Client ALUMIL S.A., 61100 Kilkis (Greece)



### Repeat test of air permeability - Test according to EN 1026

Project No. 12-002329-PR01 Task No. 12-002329  
 Client ALUMIL S.A.  
 Basis of test EN 1026:2000-06  
 Windows and doors - Air permeability - Test method

Used test equipment Pst/022200 - LWW-Prüfstand Fensterprüfstand 1  
 Test specimen Sliding door scheme D1 mit 2,3m high

Test specimen No. 33289-003  
 Date of test 09.10.2012  
 Testing personal in charge Thomas Stefan  
 Test engineer Thomas Stefan

### Information to test configuration / Test method

Test method There are no deviations to the test method according standard/basis.

Ambient conditions Temperature 22 °C Air humidity 48,9 % Air pressure 967,2 hPa

The ambient conditions are in accordance with the standard requirements.

### Testing procedure

Size of window frame	2590 mm	x	2390 mm
Size of active casement	1310 mm	x	2307 mm
Size of inactive casement	1202 mm	x	2307 mm
Area of test specimen	6,19 m <sup>2</sup>		
Length of opening joint	11,95 m		

Subsequent to the test of resistance to wind load by application of test pressures  $p_{1\text{and } p_2}$ , the upper limit of the achieved air permeability class must not be exceeded by more than 20% as set out by EN 12207.

The requirements were fulfilled.



**Watertightness - Test according to EN 1027**

<b>Project No.</b>	12-002329-PR01	<b>Task No.</b>	12-002329
<b>Client</b>	ALUMIL S.A.		
<b>Basis of test</b>	EN 1027:2000-06 Windows and doors - Watertightness - Test method		
<b>Used test equipment</b>	Pst/022200 - LWW-Prüfstand Fensterprüfstand 1		
<b>Test specimen</b>	Sliding door scheme D1 mit 2,3m high		
<b>Test specimen No.</b>	33289-001		
<b>Date of test</b>	09.10.2012		
<b>Testing personnel in charge</b>	Thomas Stefan		
<b>Test engineer</b>	Thomas Stefan		

**Information to test configuration / Test method**

**Test method** There are no deviations to the test method according standard/basis.

**Ambient conditions**      Temperature      22 °C      Air humidity      48,9 %      Air pressure      967,2 hPa

The ambient conditions are in accordance with the standard requirements.

**Testing**

Size of window frame    2590 mm      x      2390 mm

Number of spray nozzles	7	Lower nozzle line	0
Water amount	840 l/h	Water amount	0 l/h
	0,84 m³/h		0 m³/h

Spray method      A

No water penetration at up to      600 Pa detected.



**Resistance to wind load, Safety test - Test according to EN 12211**

Project No. 12-002329-PR01 Task No. 12-002329  
 Client ALUMIL S.A.  
 Basis of test EN 12211:2000-06  
 Windows and doors - Resistance to wind load - Test method  
 Used test equipment Pst/022200 - LWW-Prüfstand Fensterprüfstand 1  
 Test specimen Sliding door scheme D1 mit 2,3m high  
 Test specimen No. 33289-003  
 Date of test 09.10.2012  
 Testing personnel in charge Thomas Stefan  
 Test engineer Thomas Stefan

**Information to test configuration / Test method**

Test method There are no deviations to the test method according standard/basis.

Ambient conditions Temperature 22 °C Air humidity 48,9 % Air pressure 967,2 hPa  
 The ambient conditions are in accordance with the standard requirements.

**Safety test**

Table: Pressure steps

p <sub>3</sub>	Pa	Positive wind pressure					Negative wind pressure				
		600	1200	1800	2400	3000	-600	-1200	-1800	-2400	-3000
passed					ü					ü	

Safety test passed at up to p<sub>3</sub> ± 2400 Pa.

At the test specimen were no malfunctions detected.

**Evidence of Performance**

Air permeability, Watertightness, Resistance to wind load  
Test Report 12-002329-PR01 (PB-A01-02-en-01) dated 17. Juni 2013  
Client ALUMIL S.A., 61100 Kilkis (Greece)



**Resistance to wind load, deflection and dynamic wind load-  
Test according to EN 12211**

Project No.	12-002329-PR01	Task No.	12-002329
Client	ALUMIL S.A.		
Basis of test	EN 12211:2000-06 Windows and doors - Resistance to wind load - Test method		
Used test equipment	Pst/022200 - LWW-Prüfstand Fensterprüfstand 1		
Test specimen	Sliding door scheme D1 mit 2,3m high		
Test specimen No.	33289-003		
Date of test	09.10.2012		
Testing personal in charge	Thomas Stefan		
Test engineer	Thomas Stefan		

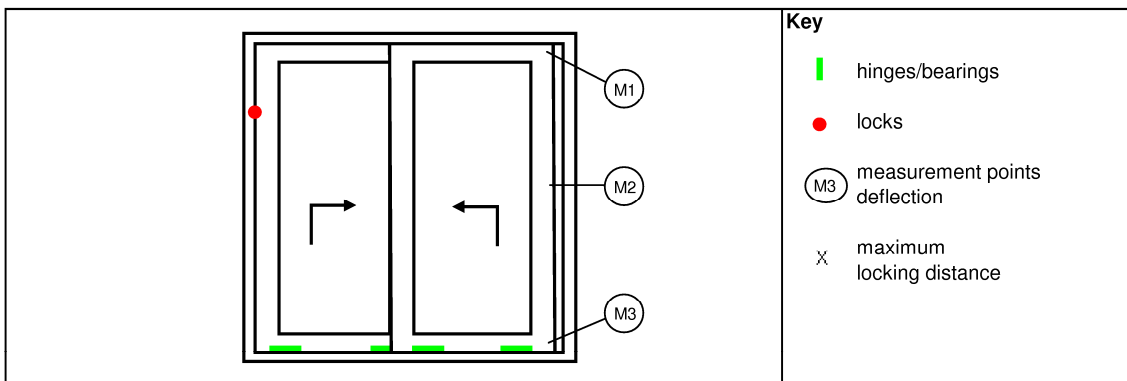
**Information to test configuration / Test method**

Test method Es gibt keine Abweichungen zum Prüfverfahren gemäß Norm/Grundlage  
Test schema C casement in opening position

Ambient conditions Temperature 22 °C Air humidity 48,9 % Air pressure 967,2 hPa

The ambient conditions are in accordance with the standard requirements.

**Testing**



Maximum test pressure:  $\pm$  1200 Pa 3 pressure pulses of 1320 Pa

**Table:** Maximum deflection for classification at effective span  $l =$  2307 mm

Class		Maximum permissible relative deflection in mm
A	( $l/150$ )	15,4
B	( $l/200$ )	11,5
C	( $l/300$ )	7,7

**Table:** Measured results of frontal deflection in mm at negative / positive wind pressure

Measured results of frontal deflection in mm	$p_1$ in Pa	Winddruck					Windsog				
		400	800	1200	1600	2000	-400	-800	-1200	-1600	-2000
M1 in mm			2,7	3,8				-1,7	-1,9		
M2 in mm			7,3	12,4				-6,5	-10,9		
M3 in mm			1,6	2,7				-1,7	-2,3		
$f_{rel}$ in mm			5,2	9,2				-4,8	-8,8		
$l/f_{rel}$			448	251				479	262		

**Table:** Permanent deformation measured at 0 Pa after 60 seconds

Permanent deflection		Pos.pr.	Neg.pr
		M1 in mm	0,2
M2 in mm	0,1	0,0	
M3 in mm	0,1	-0,1	
$f_{rel}$ in mm	0,0	0,0	

#### Key

$p_1$  Test pressure  
M1, M2, M3 frontal dislodgement at measurement points M1, M2, M3  
f frontal deflection

At the test specimen were no malfunctions detected.



**Resistance to wind load, Safety test - Test according to EN 12211**

Project No. 12-002329-PR01 Task No. 12-002329  
 Client ALUMIL S.A.  
 Basis of test EN 12211:2000-06  
 Windows and doors - Resistance to wind load - Test method  
 Used test equipment Pst/022200 - LWW-Prüfstand Fensterprüfstand 1  
 Test specimen Sliding door scheme D1 mit 2,3m high  
 Test specimen No. 33289-003  
 Date of test 09.10.2012  
 Testing personnel in charge Thomas Stefan  
 Test engineer Thomas Stefan

**Information to test configuration / Test method**

Test method There are no deviations to the test method according standard/basis.

Ambient conditions Temperature 22 °C Air humidity 48,9 % Air pressure 967,2 hPa

The ambient conditions are in accordance with the standard requirements.

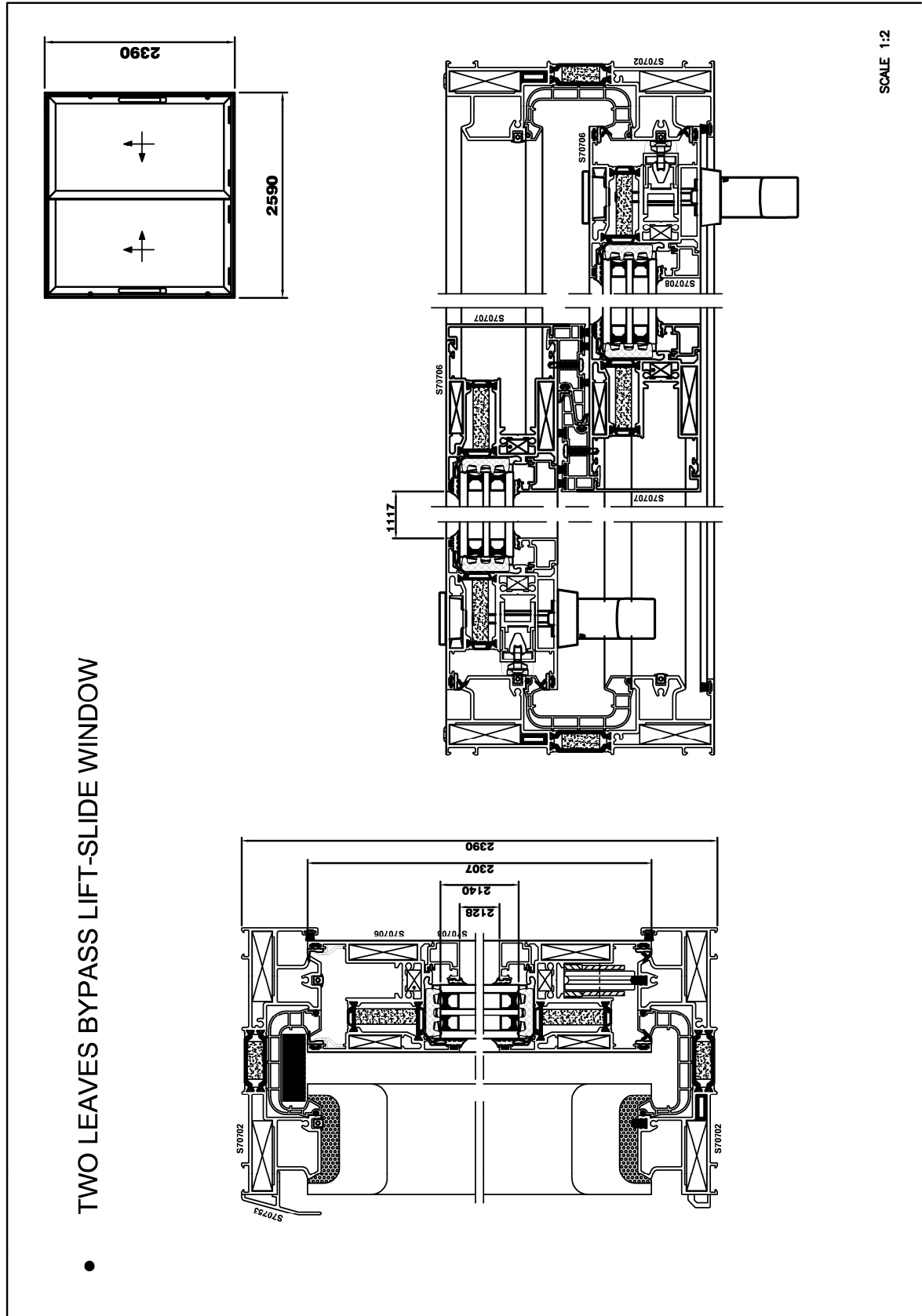
**Safety test**

Table: Pressure steps

p <sub>3</sub>	Pa	Positive wind pressure					Negative wind pressure				
		600	1200	1800	2400	3000	-600	-1200	-1800	-2400	-3000
passed				ü					ü		

Safety test passed at up to p<sub>3</sub> ± 1800 Pa.

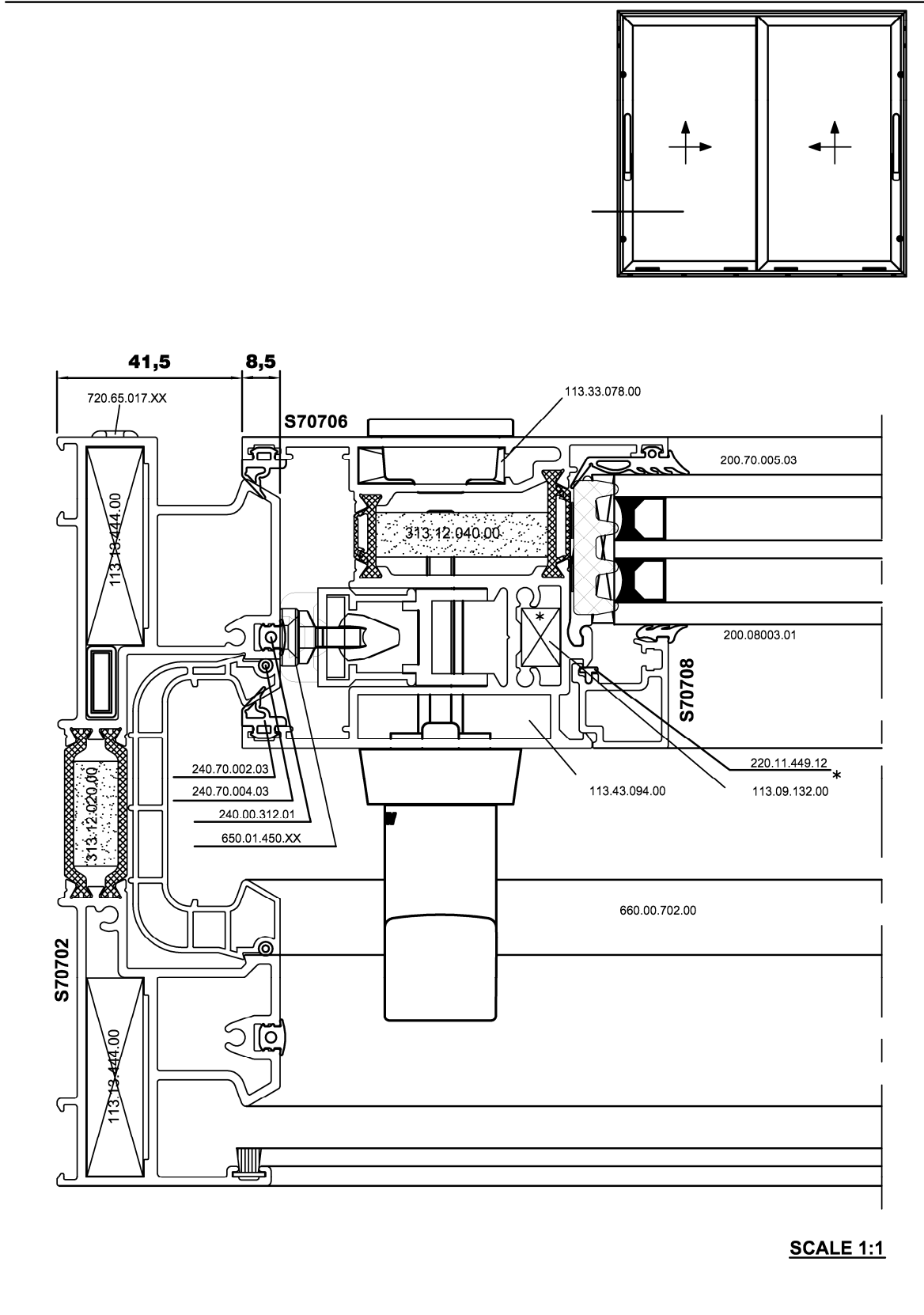
At the test specimen were no malfunctions detected.



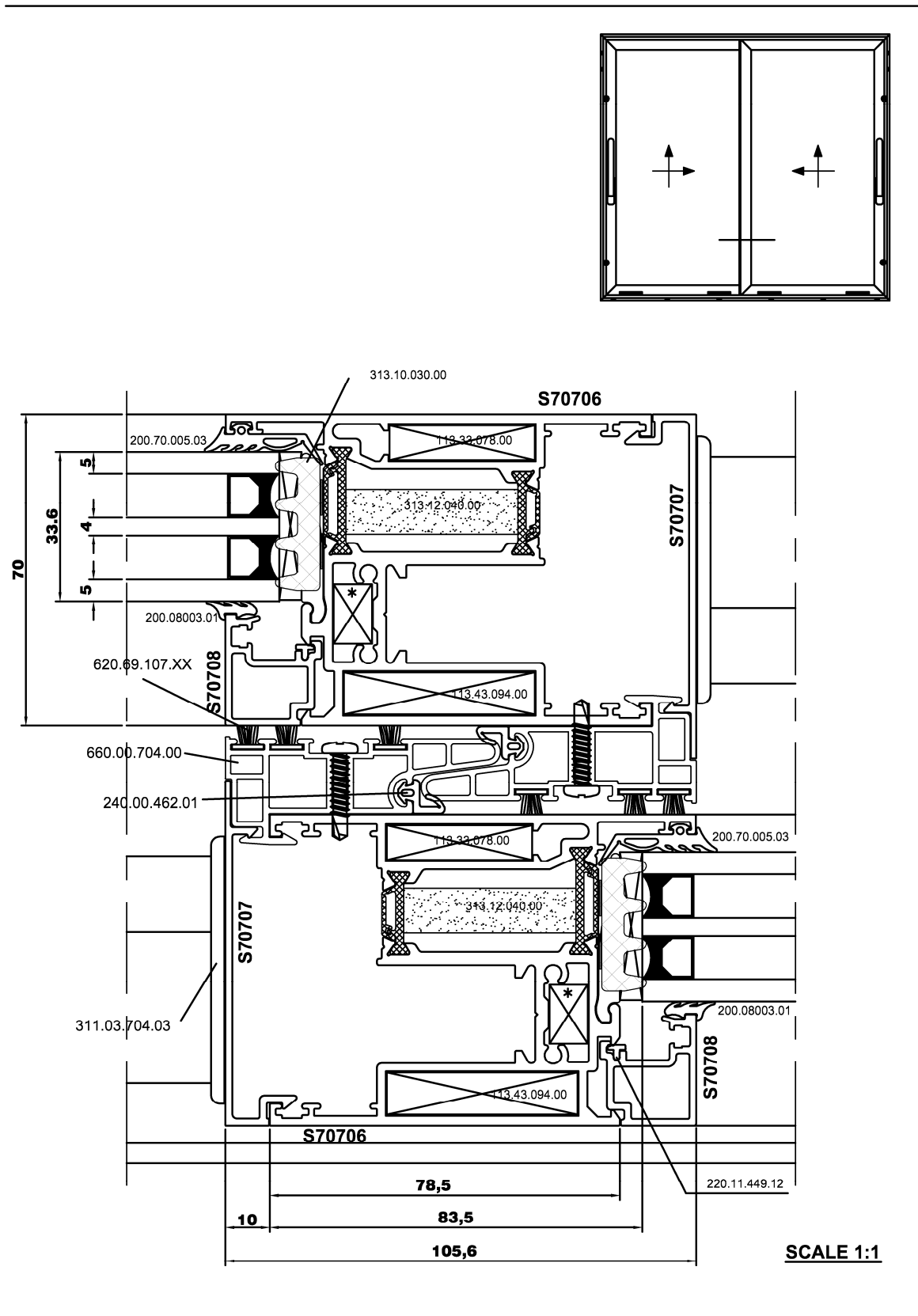
• TWO LEAVES BYPASS LIFT-SLIDE WINDOW

SCALE 1:2

Drawing 1  
Test specimen

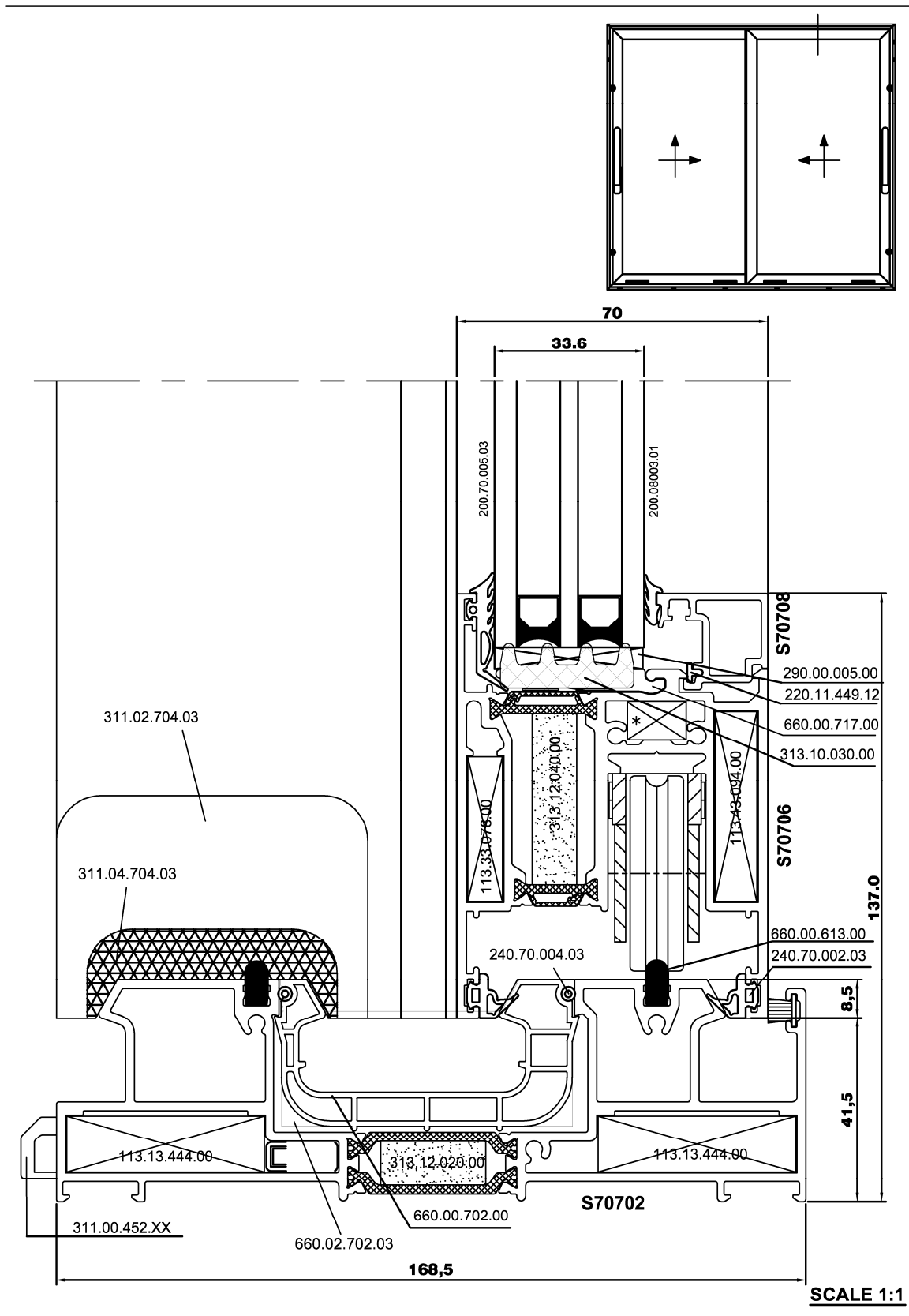


**Drawing 2**  
 Horizont section, on lock side

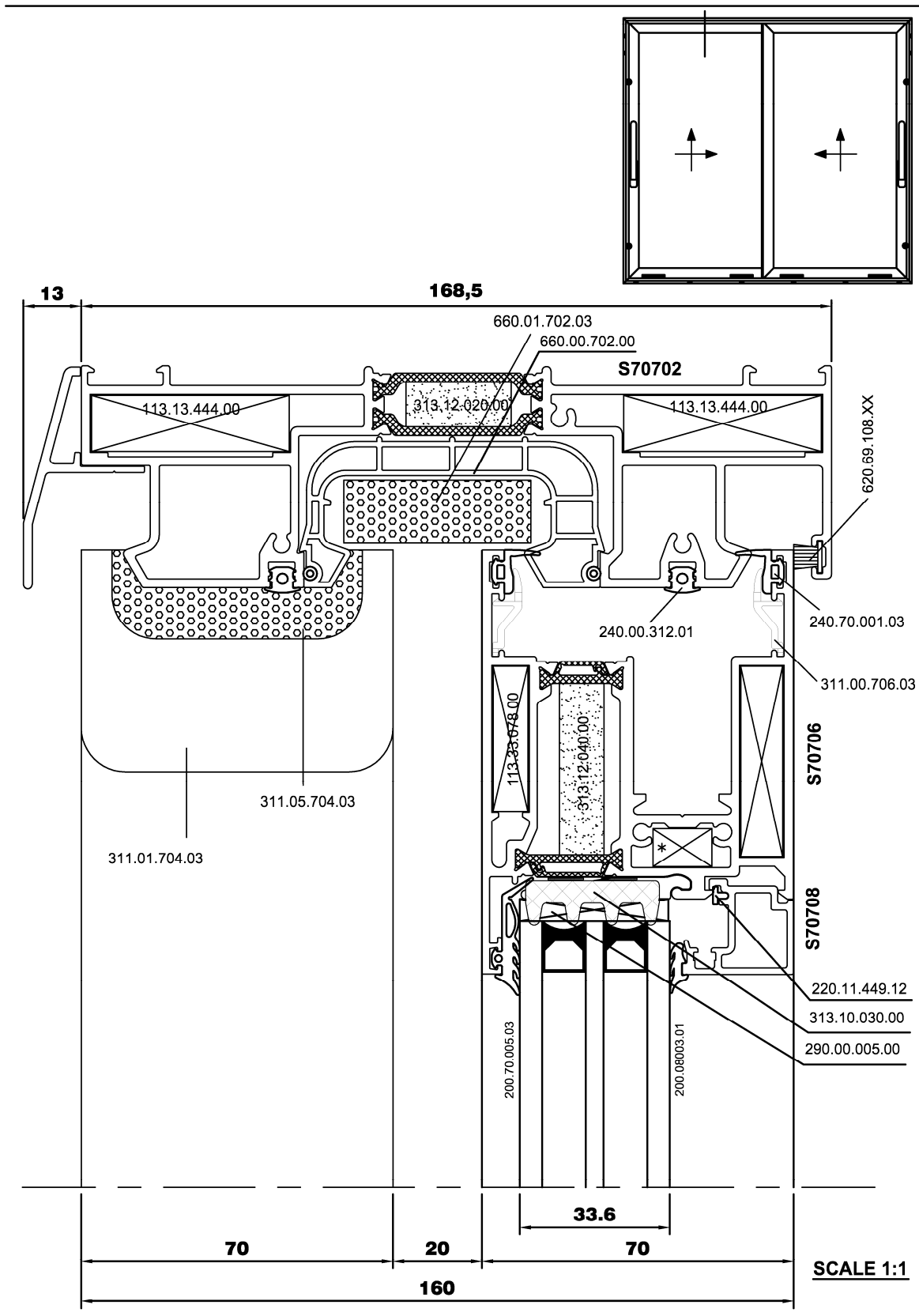


**Drawing 3**  
 Horizontal section, central meeting joint





**Drawing 5**  
 Vertical section at bottom (section is shown reflected)



**Drawing 6**  
 Vertical section at top (section is shown reflected)



**Fig. 1**  
Test specimen on test rig  
window closed



**Fig. 2**  
Casement seal at bottom, corner design



**Fig. 3**  
Central meeting joint profile at bottom, corner design



**Fig. 4**  
Central meeting joint at top, corner design



**Fig. 5**  
Central meeting joint seal at bottom



**Fig. 6**  
Central meeting joint seal at top



**Fig. 7**  
Drainage external



**Fig. 8**  
Pressure equalization frame profile



**Fig. 9**  
Lock casement



**Fig. 10**  
Handle



**Fig. 11**  
Drainage drilling for inside channel