

Evidence of Performance

Air permeability, Watertightness, Resistance to wind load



Test Report

No. 12-002205-PR01

(PB-A01-02-en-01)

Client ALCAS Aluminium
Profile Systems
Kaya Millenium Is Merkezi Kaya
Kat: 7 No:131
34524 Beylikdüzü - Istanbul
Turkey

Product Lifting sliding window with fixed sidelight

Designation System designation: AKS-129 Kaldır-Sür Sistem

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

Overall dimensions (W x H) 2,212 mm x 2,412 mm

Special features

Basis

EN 14351-1:2006+A1:2010

Test standard/s:

EN 1026:2000-06

EN 1027:2000-06

EN 12046-1:2003-11

EN 12211:2000-06

EN 14609:2004-06

Correspond/s to the national standard/s (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 / B3

ift Rosenheim

22.10.2012

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Building Components

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 22 pages.



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Deutsche
Akkreditierungsstelle
D-PL-11349-01-00
D-ZM-11349-01-00

Test Report 12-002205-PR01 (PB-A01-02-en-01) dated 22. Oktober 2012

Client: ALCAS Aluminium
Profile Systems, 34524 Beylikdüzü - Istanbul (Turkey)

1. Object

1.1 Description of test specimen

Product	Lifting sliding window with fixed sidelight
Manufacturer	Alcas Aluminium Profile Systems
Date of manufacture	June 2012
System	AKS-129 Kaldır-Sür Sistem
Type of opening / Opening directions	Lifting sliding
Frame material	Aluminium profiles with thermal break
Overall frame dimensions (W x H)	2,212 mm x 2,412 mm
Overall casement dimensions (W x H)	1,105 mm x 2,300 mm
Casement weight	83 kg
Frame member	AKS 129 F 1501, further details are given in drawings
Frame joint	mitred, compressed and bonded
Additional profile / Frame joint	Treshold AKS129 A 04, in the field of active casement, on three sides, on lock side, at top and at bottom, mitred on lock side and butt-jointed at central jamb, clipped on frame member, corners sealed with pourable sealant Drip rail AS50 A 03, screwed on frame member, sealed with elastic sealant Channel profile PVC/U black, AS053, lateral, at top and at bottom, clipped on frame member, sealed with pourable sealant in corners Covering profile AS022, lateral and at top, clipped on frame member, butt-jointed in corners
Casement member	AKS129 V 1501, further details are given in drawings
Frame joint	mitred, compressed and bonded
Additional profile / Frame joint	Cover profile AKS129 A 02, each casement, vertical at central jamb, clipped on casement member and screwed Cover cap with brush gasket, at top and at bottom, clipped and screwed on cover profile
Rebate design	
Rebate drainage	Active casement: 3 slots of 10 mm x 20 mm inside rebate, to outside front 4 slots of 10/6 mm x 20/30 mm, with cover caps Fixed side light: 2 drills Ø 6 mm inside rebate with cover caps, to outside front 2 slots of 6 mm x 30 mm, with cover caps In roller track channel, horizontal at bottom 2 drills Ø 8 mm In inside profile channel, horizontal at bottom 2 drills Ø 8 mm
Rebate seal	
Frame member	
Material	Sealing material – brush gasket
Manufacturer	Supplier Alcas Aluminium Profile Systems
Item No.	AS012
Corner design	in the field of casement on treshold, on three sides, on lock side, at top and at bottom, mitred on lock side and butt-jointed at central jamb

Test Report 12-002205-PR01 (PB-A01-02-en-01) dated 22. Oktober 2012

Client: ALCAS Aluminium
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Casement member

Material	Sealing material – EPDM
Manufacturer	Coşkun Kauçuk
Item No.	AF006
Corner design	Horizontal at top and bottom, mitred
Material	Sealing material – EPDM
Manufacturer	Coşkun Kauçuk
Item No.	AF006A
Corner design	Lateral on lock side, mitred

Central jamb

Material	Sealing material – EPDM
Manufacturer	Coşkun Kauçuk
Item No.	AF 007
Corner design	vertical at central jamb, at top and bottom butt-jointed
Material	brush gasket
Manufacturer	Supplier Alcas Aluminium Profile Systems
Item No.	AS012
Corner design	vertical at central jamb, at top and bottom butt-jointed
Material	Sealing Part – Brush seal
Manufacturer	Supplier Alcas Aluminium Profile Systems
Item No.	AS052
Corner design	At top and bottom, sealed with pourable sealant

Pressure equalisation

at top 4 slots of 10 mm x 20mm
at top 3 drills Ø 10 mm
Insulating glass unit, configuration 6 / 12 / 6

Infill

Installation of infills

Glazing gasket

External

Material	Sealing material – EPDM
Manufacturer	Coşkun Kauçuk
Item No.	AF 014
Corner design	mitred and bonded

Internal

Material	Sealing material – EPDM
Manufacturer	Coşkun Kauçuk
Item No.	AF 013
Corner design	butt-jointed with glazing bead 22 G 03 / 22 G 02

at bottom 2 drills Ø 10 mm, lateral at top one drill Ø 8 mm

Vapour pressure equalisation

Hardware

Type / Manufacturer	Lifting sliding hardware, HS GU 937, Gretsch-Unitas GmbH
Hinges / Bearings	4 roller bearings
Number of locks	Lateral 2
Maximum locking distance	715 mm
Position of locks	neutral



Test Report 12-002205-PR01 (PB-A01-02-en-01) dated 22. Oktober 2012

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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: Alcas Aluminium Profile Systems
Date: 28 August 2012
Verification: A sampling report has been provided to the ift.
Delivered on: 27 August 2012
ift-Pk-Number: 28389/067

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 12046-1:2003-11
Operating forces - Test method - Part 1: Windows
EN 12211:2000-06
Windows and doors - Resistance to wind load - Test method
EN 14609:2004-06
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
EN 14351-1:2006+A1:2010
Windows and doors - Product standard, performance characteristics -
Part 1: Windows and external pedestrian doorsets without resistance to fire and/or
smoke leakage characteristics

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

Test Report 12-002205-PR01 (PB-A01-02-en-01) dated 22. Oktober 2012
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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.

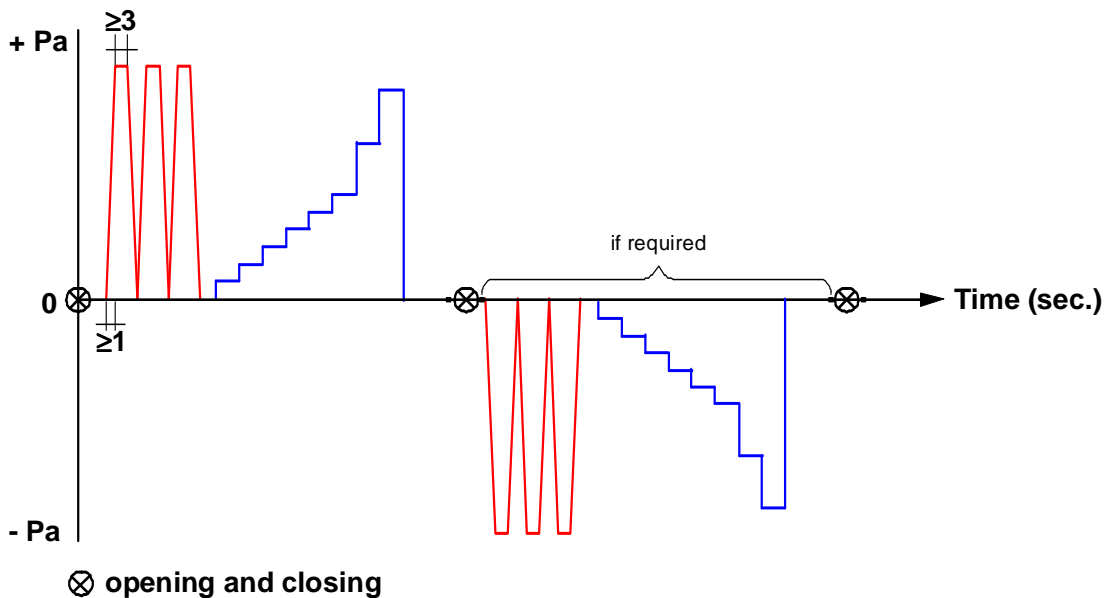


Illustration Test sequence for air permeability

Client: ALCAS Aluminium
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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 Δp_1 and negative test pressure Δp_1 . Then the test specimen is subjected to 50 cycles including negative and positive pressures of $\pm \Delta p_2 = \Delta p_1 - 50\%$.

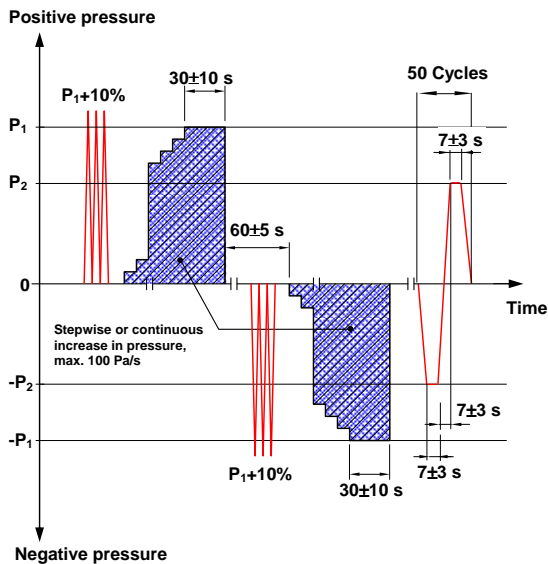


Illustration Test sequence for resistance to wind load

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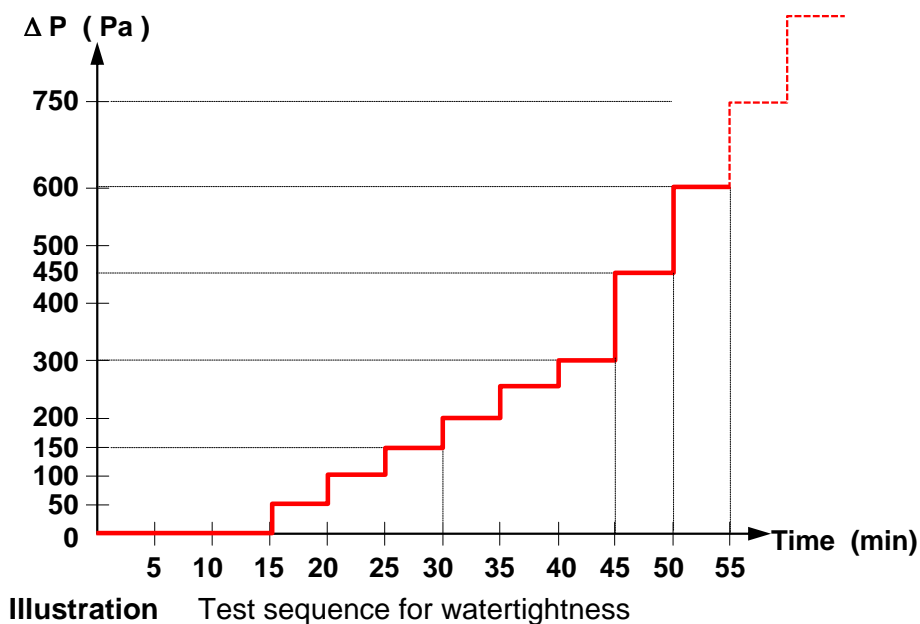


Air permeability – Repeat test - EN 1026

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.



Test Report 12-002205-PR01 (PB-A01-02-en-01) dated 22. Oktober 2012
Client: ALCAS Aluminium
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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 $\Delta p_3 = p_1 + 50\%$.

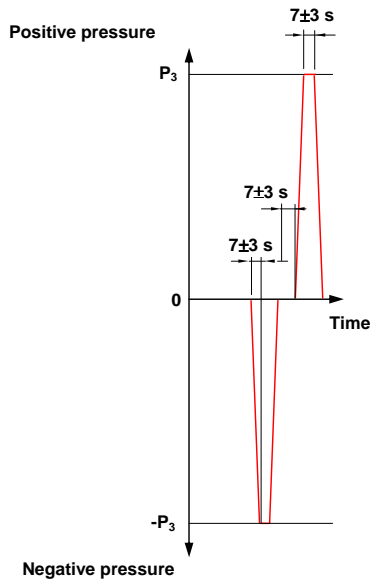


Illustration Test sequence for safety test

Load-bearing capacity of safety devices - EN 14609

Load-bearing capacity of safety devices is tested in accordance with EN 14609. The safety devices are subjected to individual loads of 350 N in the most unfavourable loading direction for 60 seconds. The load is applied pointwise. In deviation from EN 14609 the load can be applied directly to the safety device so as to test the most unfavourable load application to the stay bearing.

Test Report 12-002205-PR01 (PB-A01-02-en-01) dated 22. Oktober 2012

Client: ALCAS Aluminium
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3. Detailed results

Test record

Specimen	Lifting sliding window			
Project No.	12-002205			
Client	Alcas Aluminium Profile Systems	Size of window frame	2200	x 2400 mm
System	AKS-129 Kaldır-Sür Sistem	Size of casement	1105	x 2300 mm
Frame material	Aluminium profiles with thermal break			
Date of test	29. August 2012	Area of test specimen	5,3	m ²
Tester	A.Özcelik	Length of opening joints	6,8	m
Specimen No.	28389/067	Casement weight	83,0	kg
Date of delivery	27. August 2012	Temperature	28,4	° C
Date of manufacture	August 2012	Air humidity	59	%
Attended by:	Ersin Cengiz	Air pressure	1008	hPa

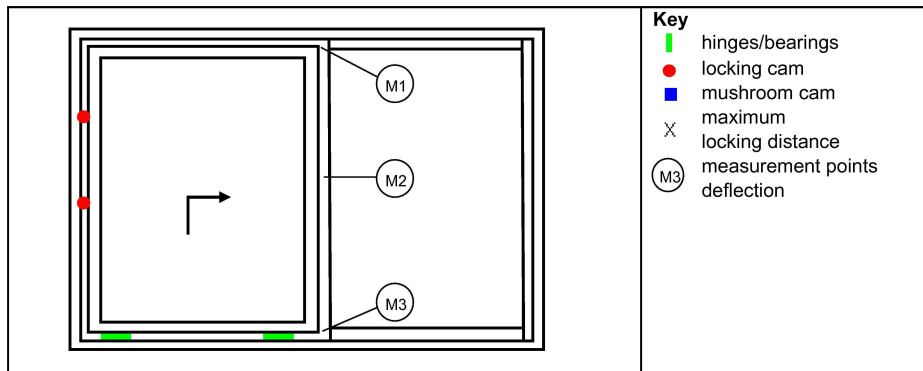


Figure 1 View of specimen

1 Operating forces - Test according to EN 12046

Table: Measurement of operating forces

Individual measured	1	2	3	Average value
in N	92,0	93,9	91,7	92,5

2 Air permeability - Test according to EN 1026

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 ³ /h	7,6	11,3	15,2	18,1	20,6	22,8	28,8	33,8
	Joint length-related m ³ /hm	1,12	1,66	2,23	2,66	3,02	3,35	4,23	4,96
	Overall area-related m ³ /hm ²	1,44	2,14	2,88	3,43	3,90	4,32	5,45	6,40

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 ³ /h	10,1	14,1	17,9	21,8	25,7	30,5	47,4	61,8
	Joint length-related m ³ /hm	1,48	2,07	2,63	3,20	3,77	4,48	6,96	9,07
	Overall area-related m ³ /hm ²	1,91	2,67	3,39	4,13	4,87	5,78	8,98	11,70

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 ³ /h	8,9	12,7	16,6	20,0	23,2	26,7	38,1	47,8
	Joint length-related m ³ /hm	1,30	1,86	2,43	2,93	3,40	3,91	5,59	7,02
	Overall area-related m ³ /hm ²	1,68	2,41	3,13	3,78	4,38	5,05	7,22	9,05

Test Report 12-002205-PR01 (PB-A01-02-en-01) dated 22. Oktober 2012

Client: ALCAS Aluminium
Profile Systems, 34524 Beylikdüzü - Istanbul (Turkey)

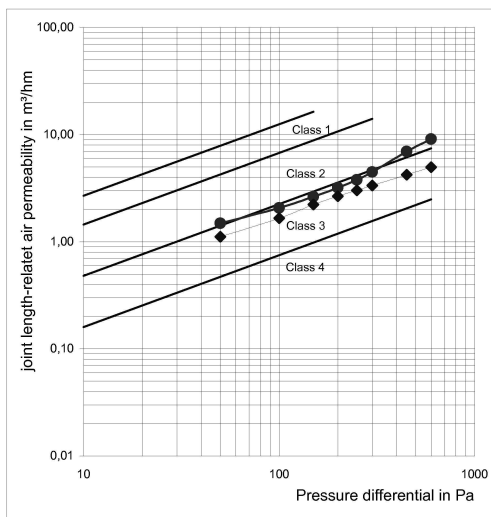


Diagram: Joint length-related air permeability
(positive and negative wind pressures)

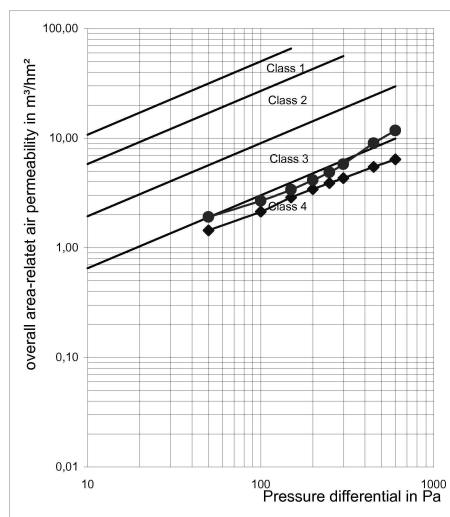


Diagram: Overall area-related air permeability
(positive and negative wind pressures)

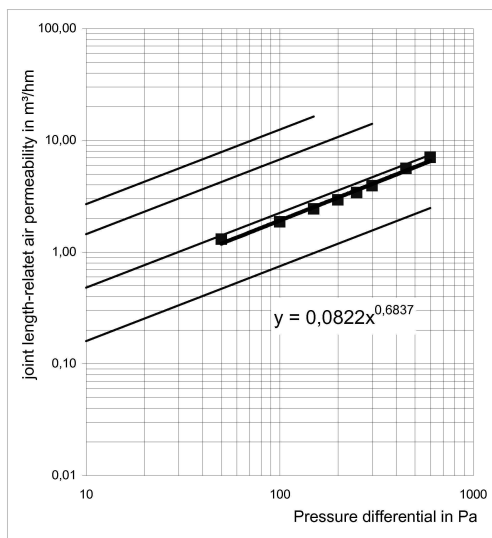


Diagram: Joint length-related air permeability
(average value from positive and negative wind pressures)

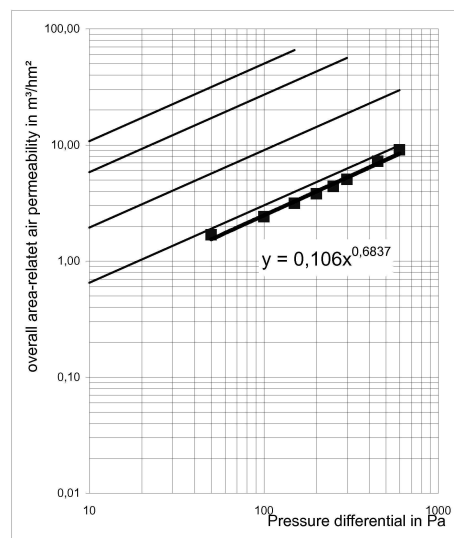


Diagram: Overall area-related air permeability
(average value from positive and negative wind pressures)

Table: Measured results

Reference air permeability related to joint length	Q100 = 1,92 m³/hm
Reference air permeability related to overall area	Q100 = 2,47 m³/hm²

Test Report 12-002205-PR01 (PB-A01-02-en-01) dated 22. Oktober 2012

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3 Resistance to wind load - Test according to EN 12211

3.1 Deflection under wind load

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

Table: Maximum deflection for classification at effective span $l =$ 2300 mm

Class	maximum permissible relative deflection in mm	
A	($l/150$)	15,3
B	($l/200$)	11,5
C	($l/300$)	7,7

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

	p_1 in Pa	Positive wind pressure					Negative wind pressure				
		400	800	1200	1600	2000	-400	-800	-1200	-1600	-2000
Measured results of frontal deflection in mm	M1 in mm	0,7	1,4	1,8			-0,9	-1,7	-2,6		
	M2 in mm	2,6	5,3	8,6			-2,5	-5,7	-9,3		
	M3 in mm	0,7	1,3	1,8			-0,9	-1,7	-2,5		
	f_{rel} in mm	1,9	4,0	6,8			-1,6	-4,0	-6,7		
	l/f_{rel}	1243	578	338			-1460	-576	-343		

Key

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

3.2 Dynamic wind loads (negative / positive pressures)

Table: Pressure steps

p_2	Pa	200	400	600	800	1000
passed				✓		

50 cycles at $p_2 \pm$ 600 Pa
No malfunctions were detected.

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

Subsequent to the test of resistance to wind load by application of test pressures p_1 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 (Clause 2 of this test record).
The requirements were fulfilled.

5 Watertightness - Test according to EN 1027

No water penetration at up to 600 Pa detected.

3.3 Resistance to wind load - Test according to EN 12211 - Safety test

p_2	Pa	positive wind pressure					negative wind pressure				
		600	1200	1800	2400	3000	-600	-1200	-1800	-2400	-3000
passed				✓					✓		

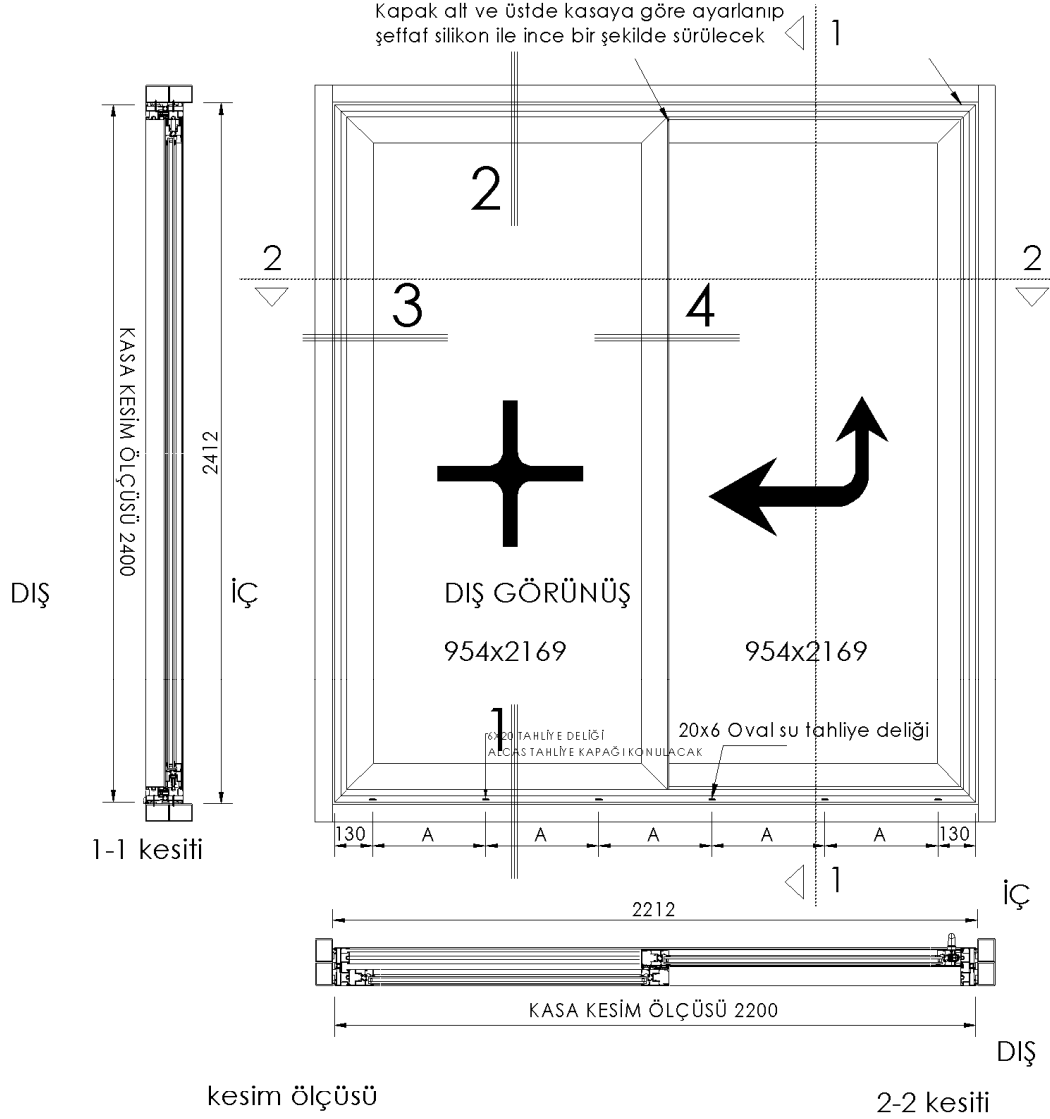
Safety test passed at up to $p_3 \pm$ 1800 Pa passed.

ift Rosenheim
29. August 2012

Test Report 12-002205-PR01 (PB-A01-02-en-01) dated 22.10.2012
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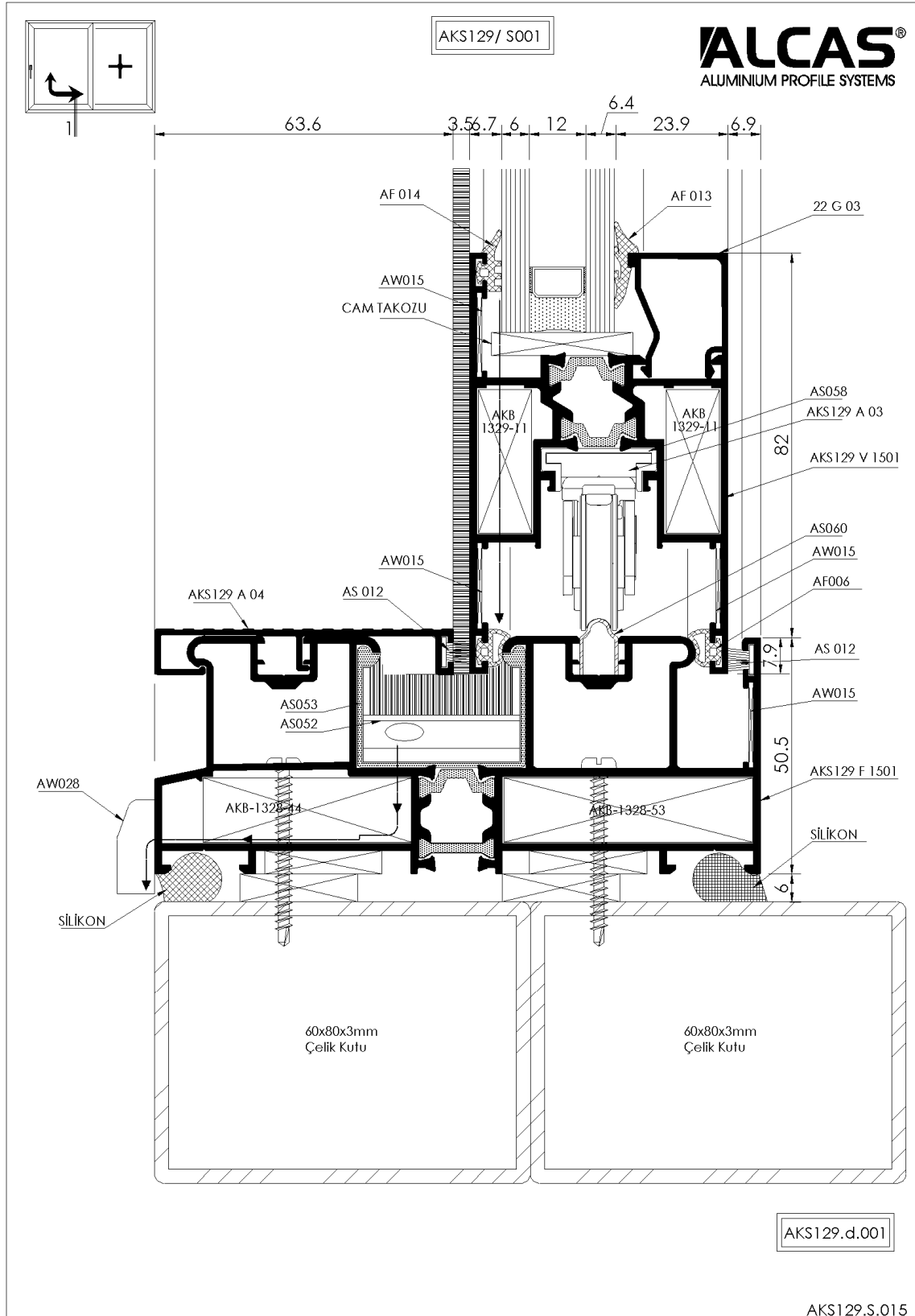
ALCAS®
ALUMINIUM PROFILE SYSTEMS



L:2200mmx2 Ad
L:2400mmx2 Ad
L:1100mmx4 Ad
L:2315mmx4 Ad
L:1000mmx2 Ad
L:2315mmx1 Ad

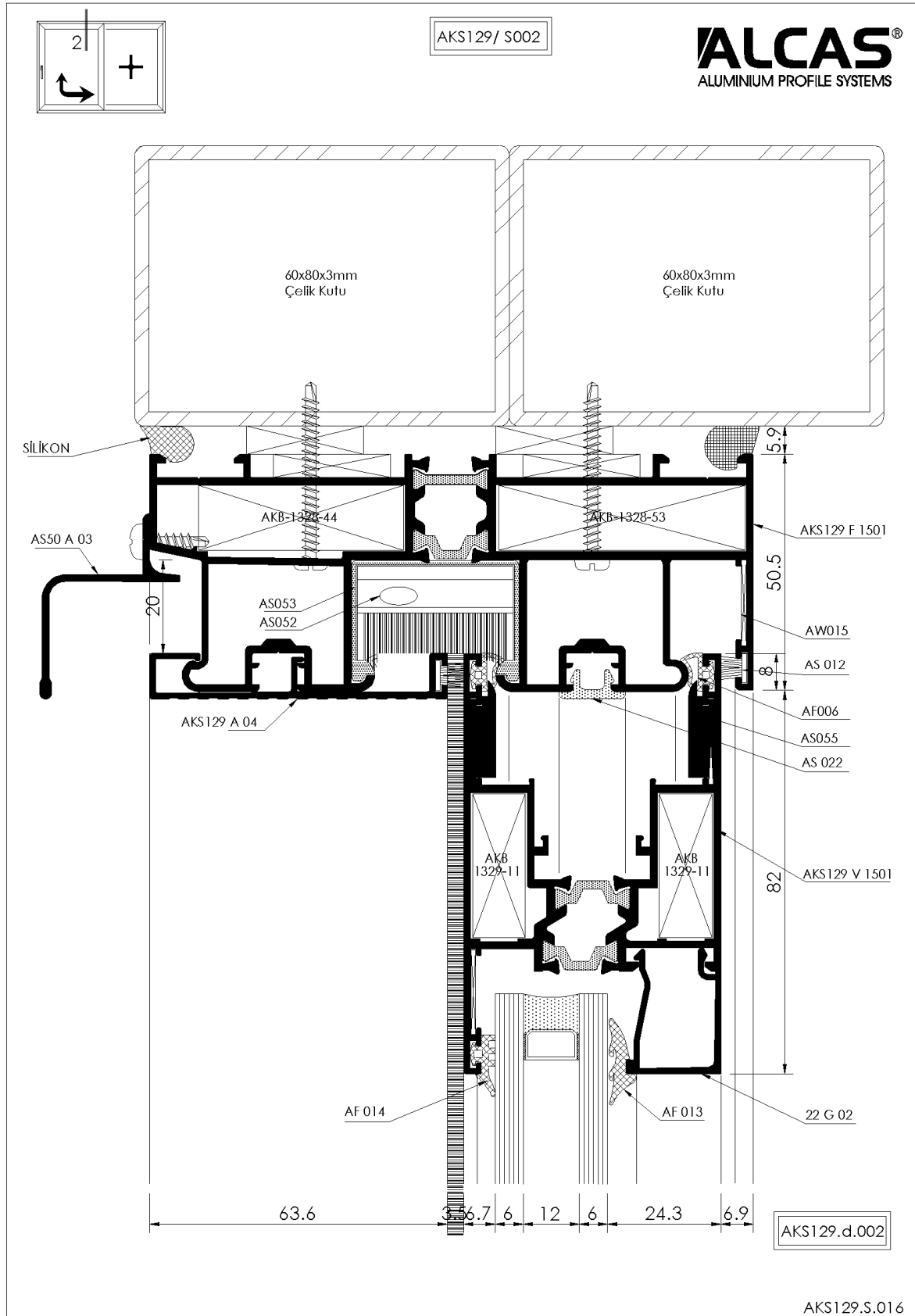
AKS-129 KALDIR-SÜR SİSTEM
TEK KANAT HAREKETLİ

Drawing Drawing of test specimen



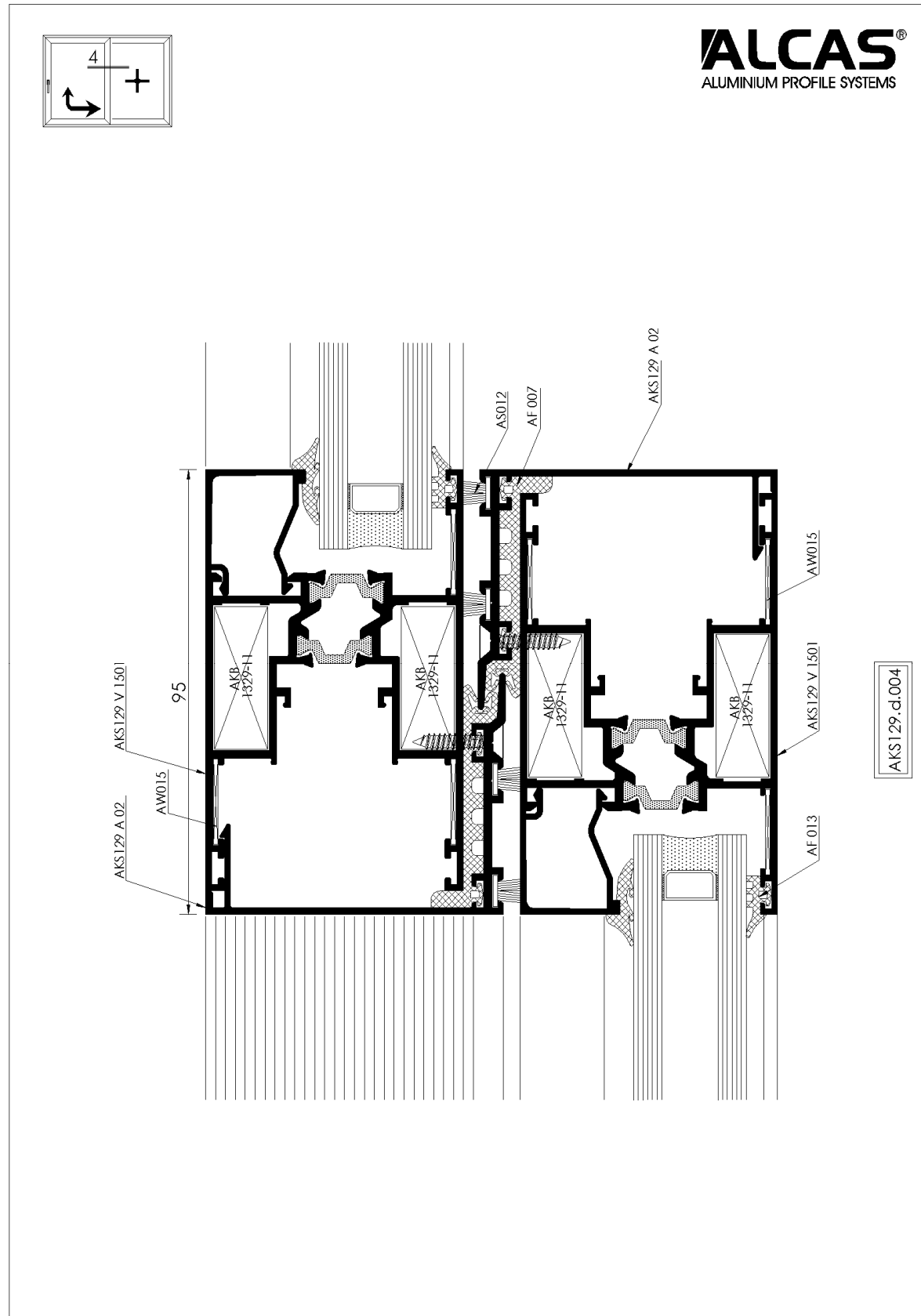
Drawing Vertical section 1

Test Report 12-002205-PR01 (PB-A01-02-en-01) dated 22.10.2012
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Drawing Vertical section 2

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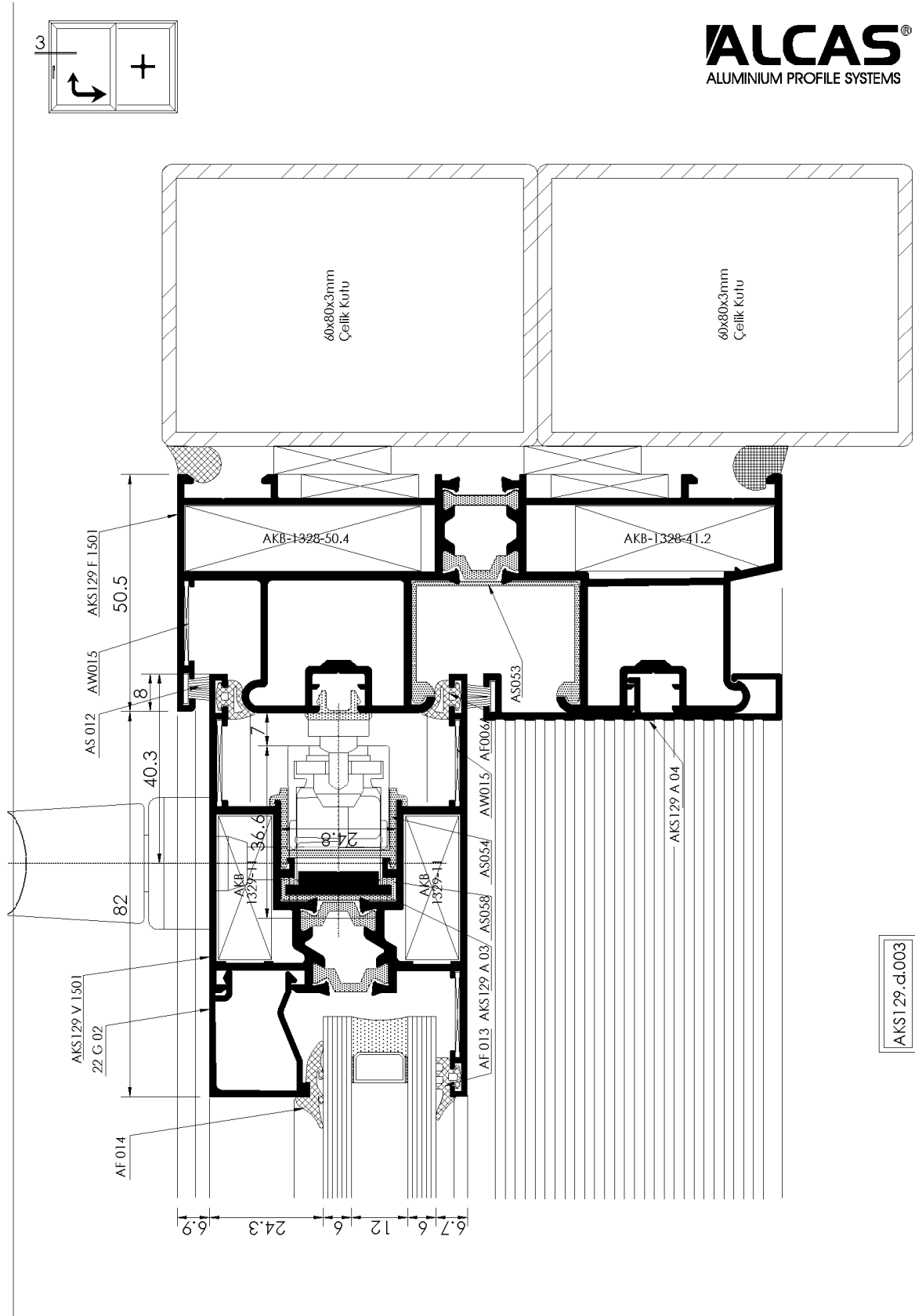
Drawing Central jamb

Test Report 12-002205-PR01 (PB-A01-02-en-01) dated 22.10.2012

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Drawing Horizontal section

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Picture
Test specimen on window test rig
Window closed



Picture
Test specimen on window test rig
Window open



Picture
Test setup measurement of deflection



Picture
Rebate drainage 1, inside rebate



Picture
Rebate drainage 1, to outside front