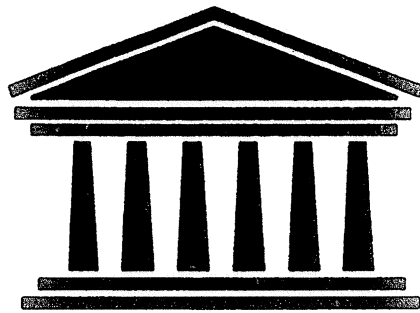




Universiteit
Gent

Testcentrum
voor
Gevelelementen

TEST REPORT NR. 363/2341

TEST CARRIED OUT IN ACCORDANCE WITH

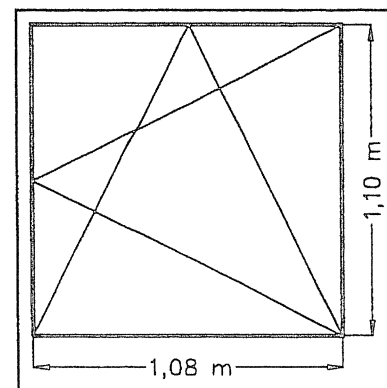
STS 52.0 EDITION 1985

ON AN TILT AND TURN WINDOW
WITH THERMAL BREAK.

TEST REPORT NR: 363/2341

TEST CARRIED OUT ON AN
AN TILT AND TURN WINDOW
WITH THERMAL BREAK

OF THE COMPANY:
ALIPLAST ALUMINIUM SYSTEMS



1 APPLICANT:

ALIPLAST ALUMINIUM SYSTEMS

Waaslandlaan 15
9160 LOKEREN

Contact: Dhr. Scheldeman P.
Phone: 09 340 55 55

2 MANUFACTURER:

ALIPLAST ALUMINIUM SYSTEMS

Waaslandlaan 15
9160 LOKEREN

Phone: 09 340 55 55

3 DESTINATION: Rewa

4 MATERIAL SENT FOR TEST:

4.1. Identification of the test element:

Test element supplied by the applicant on 98-05-28 and in
accordance with the included drawing with ref. nr.: 363/2341
Drawing certified with the stamp:

4.2. Dimensions of the test element:

width : 1.08 m
height : 1.10 m
total surf.: 1.19 m²
length of the opening joints: 4.14 m
surface of the opening light frame: 1.07 m²

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4.3. Description of the parts of the test element:

Sections:

material : aluminium with thermal break
type : serie VL
type of connection: pressed and glued

Tightening strips:

material: epdm
type : ACVL 30 - ACVL 62
place : middle (with corner for central gasket)
and inside

Glass:

thickness : double 6+12+6 mm
type : not indicated
way of glazing: pre-fabricated profils

Fittings:

hinges: mark : Aliplast
type : Maxim-Line
number: 2

closing fittings: mark: Aliplast
type: Maxim-Line

closing fittings: mark:
number of locking points: 2+1 on the arm

Drainage:

of the glazing : see drawing ref. nr. 363/2341
of the opening joint : see drawing ref. nr. 363/2341

Ventilating of the opening joint: see drawing ref. nr. 363/2341

5 INSTALLATION IN THE TEST CENTER:
.....

The element to test is fixed on the test chamber in accordance with
the included drawing nr.: 363/2341 and scheme 363/1/1.

Air temperature in the test chamber: 21.0 °C

Air temperature in the test center : 21.0 °C

6 TESTS CARRIED OUT: see sheme 363/1/2

.....

6.1. Air permeability in accordance with NBN B 25-204:

6.1.1. Positive pressure see fig. 363/2341 /1

Pres- sure. Pa	Air permeability m ³ /h	Per m opening joint m ³ /hm	Per m ² opening surf. m ³ /hm ²	Per m ² tot. surface. m ³ /hm ²
50.	1.23	0.30	1.14	1.03
100.	1.89	0.46	1.77	1.59
150.	2.42	0.59	2.26	2.04
200.	2.90	0.70	2.71	2.44
300.	3.84	0.93	3.59	3.23
400.	4.62	1.12	4.32	3.89
500.	5.37	1.30	5.02	4.52
600.	6.28	1.52	5.87	5.28
500.	5.56	1.34	5.19	4.68
400.	4.81	1.16	4.49	4.05
300.	3.96	0.96	3.70	3.33
200.	3.03	0.73	2.83	2.55
150.	2.50	0.60	2.34	2.11
100.	1.95	0.47	1.82	1.64
50.	1.25	0.30	1.17	1.05

6.1.2. Negative pressure see fig. 363/2341 /1

Pres- sure. Pa	Air permeability m ³ /h	Per m opening joint m ³ /hm	Per m ² opening surf. m ³ /hm ²	Per m ² tot. surface. m ³ /hm ²
50.	1.25	0.30	1.17	1.05
100.	2.00	0.48	1.86	1.68
150.	2.50	0.60	2.34	2.11
200.	2.99	0.72	2.79	2.52
300.	3.85	0.93	3.60	3.24
400.	4.57	1.10	4.27	3.85
500.	5.13	1.24	4.80	4.32
600.	5.69	1.37	5.32	4.79
500.	5.13	1.24	4.80	4.32
400.	4.57	1.10	4.27	3.85
300.	3.85	0.93	3.60	3.24
200.	2.99	0.72	2.79	2.52
150.	2.50	0.60	2.34	2.11
100.	2.00	0.48	1.86	1.68
50.	1.25	0.30	1.17	1.05

REMARKS: none.

6.2. Testing the wind resistance in accordance with NBN B 25-205:

6.2.1. Deformation test by positive pressure measured over a length of 1.00 m in point B see fig. 363/2341 /2:

Pressure Pa	Deformation point B mm	Relative deformation
50.	0.0	0.0
100.	0.0	0.0
150.	0.0	0.0
200.	0.0	0.0
300.	0.1	1./10000.
400.	0.1	1./10000.
500.	0.1	1./10000.
600.	0.2	1./ 5000.
750.	0.2	1./ 5000.
1000.	0.3	1./ 3333.

Permanent deformation: 0.0 mm

RESULT: the element is satisfactory.

6.2.2. Deformation test by negative pressure measured over a length of 1.00 m in point B see fig. 363/2341 /2

Pressure Pa	Deformation point B mm	Relative deformation
50.	0.0	0.0
100.	0.0	0.0
150.	0.0	0.0
200.	0.0	0.0
300.	0.0	0.0
400.	0.1	1./10000.
500.	0.1	1./10000.
600.	0.1	1./10000.
750.	0.2	1./ 5000.
1000.	0.2	1./ 5000.

Permanent deformation: 0.0 mm

RESULT: the element is satisfactory.

6.2.3. Repeated positive and negative pressure test from 0 to 750. Pa (50 cycles positive and 50 cycles negative).

6.3. Control of the air permeability in accordance with NBN B 25-204:
(After test 6.2. the wind resistance.)

6.3.1. Positive pressure see fig 363/2341 /1:
Difference in air permeability expressed in percentage and in
 m^3/hm opening joint in relation to test 6.1.1.

Pres- sure Pa	Difference air permeability %	per m opening joint m^3/hm
50.	0.0	0.00
100.	0.9	0.00
150.	1.1	0.01
200.	1.9	0.01
300.	0.0	0.00
400.	1.4	0.02
500.	2.5	0.03
600.	0.3	0.01
500.	1.4	0.02
400.	0.4	0.00
300.	0.4	0.00
200.	1.1	0.01
150.	0.0	0.00
100.	0.0	0.00
50.	0.0	0.00

6.3.2. Negative pressure see fig 363/2341 /1:
Difference in air permeability expressed in percentage and in
 m^3/hm opening joint in relation to test 6.1.2.

Pres- sure Pa	Difference air permeability %	per m opening joint m^3/hm
50.	0.0	0.00
100.	-1.7	-0.01
150.	0.0	0.00
200.	-0.4	0.00
300.	-0.9	-0.01
400.	-0.5	-0.01
500.	-0.7	-0.01
600.	0.0	0.00
500.	-0.5	-0.01
400.	-0.2	0.00
300.	-0.9	-0.01
200.	-0.4	0.00
150.	0.0	0.00
100.	-1.7	-0.01
50.	0.0	0.00

6.3.3. Conservation of the qualities:

The air permeability measured after the wind resistance test may not be higher than 20 % (with a minimum of $0.3 \text{ m}^3/\text{hm}$ opening joint) of the air permeability measured before the wind resistance test.

RESULT: the element is satisfactory.

5.4. Watertightness test in accordance with NBN B 25-209:

6.4.1. Under static air pressure:

Pressure Pa	Duration min.	Remarks
0	15	no infiltration
50	5	no infiltration
100	5	no infiltration
150	5	no infiltration
200	5	no infiltration
300	5	no infiltration
400	5	no infiltration
500	5	no infiltration

6.4.2. Under dynamic air pressure:

50 pulsations are carried out between 0 + 50 Pa and 250 + and - 50 Pa:
no infiltration

6.5. Mechanical tests in accordance with NBN B 25-210:

6.5.1. Locking power : 55.0 N

6.5.2. Unlocking power: 53.6 N

6.5.3. Power necessary to start moving the opening light frame: 2.6 N

6.5.4. Power necessary to move the opening light frame: 1.4 N

6.5.5. Warp test: see fig. 363/2341 /3

The fittings are unlocked and at the handle side a corner of the opening light frame is blocked. At the height of the handle a horizontal power of 400 N is put on

RESULT:

There was no damage or faulty operation after the test.

6.5.6. Vertical load on the opening light frame: see fig. /2341 /4
A vertical power of 500 N is put on the opening light frame corner during 5 min.

RESULT:

There was no damage or faulty operation after the test.

6.5.7. Testing the link arm and hinges: see fig. /2341 /5

The full open of the opening light frame is simulated.

RESULT:

There was no damage or faulty operation after the test.

6.6. Test for wind resistance in accordance with NBN B 25-205:

6.6.1. Safety test with a positive pressure of: 2000. Pa

RESULT:

There was no damage or faulty operation after the test.

6.6.2. Safety test with a negative pressure of: 2000. Pa

RESULT:

There was no damage or faulty operation after the test.

7 EVALUATION:

.....

7.1. In accordance with STS 52.0:
results for

- air permeability : PA3
- wind resistance : PV2
- watertightness : PE4
- mechanical behaviour: the element is satisfactory

7.2. In accordance with UEATC:
class for

- air permeability : A3
- wind resistance : V2
- watertightness : E4
- mechanical behaviour: the element is satisfactory

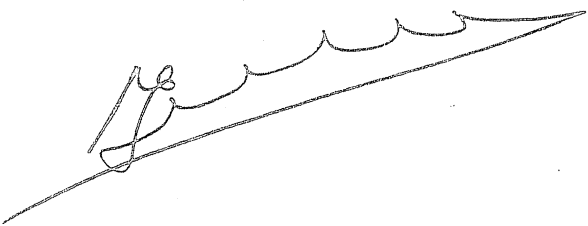
8 REMARKS:

.....

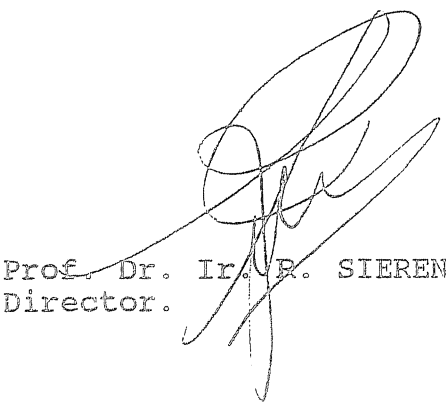
8.1. The results are only valid under the conditions as ruling during the test.

8.2. This report is only valid when showing the reference number and stamp on all annexes.

8.3. Partial copy of this report is not allowed without written consent of Prof. Dr. Ir. R. SIERENS, director of the "Testcentrum voor Gevelelementen".


R. HUWEL

Engineer responsible for the tests.


Prof. Dr. Ir. R. SIERENS
Director.

ANNEXES:

.....

Drawings nr.

363/1/1

363/1/2

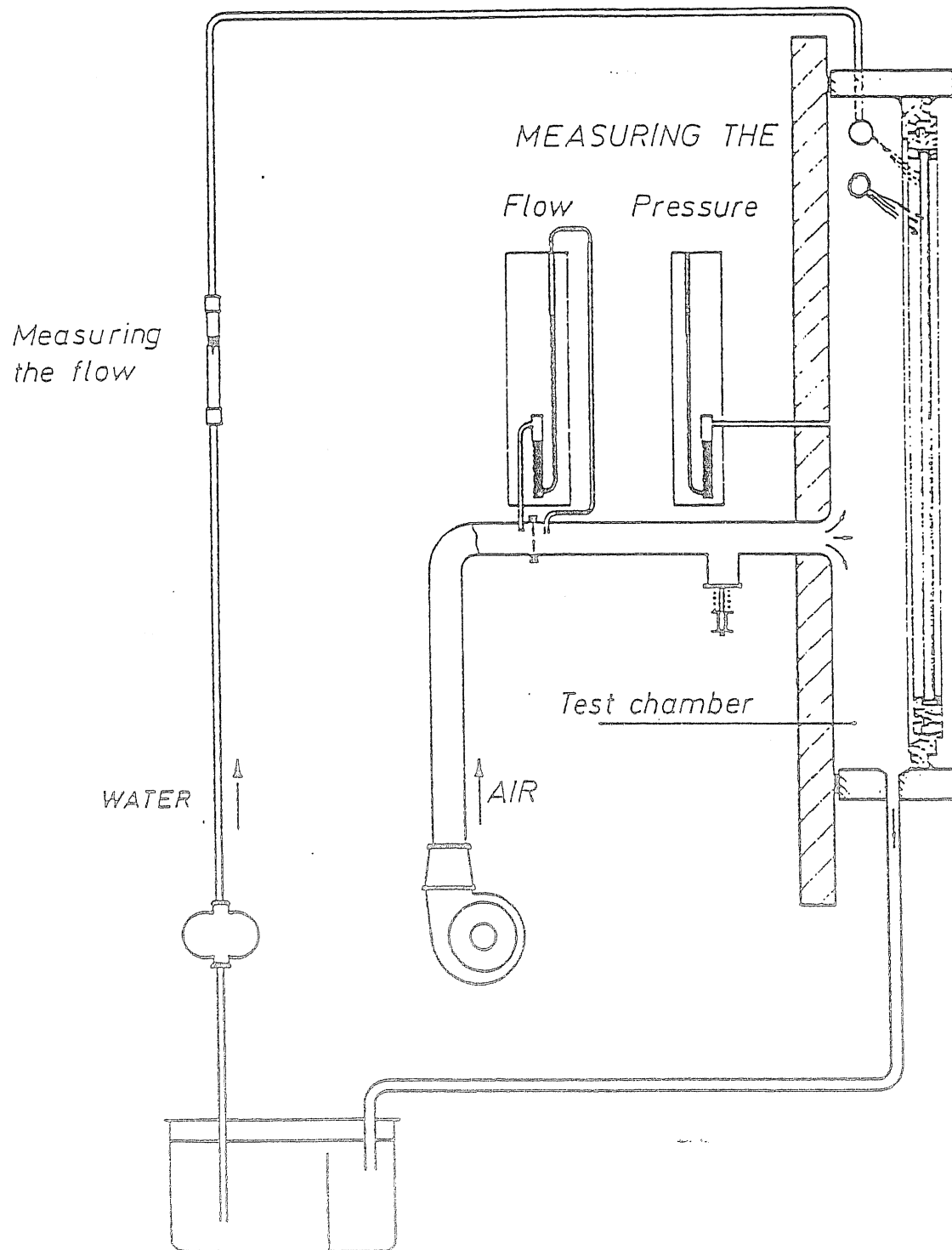
363/2341

Figures nr.

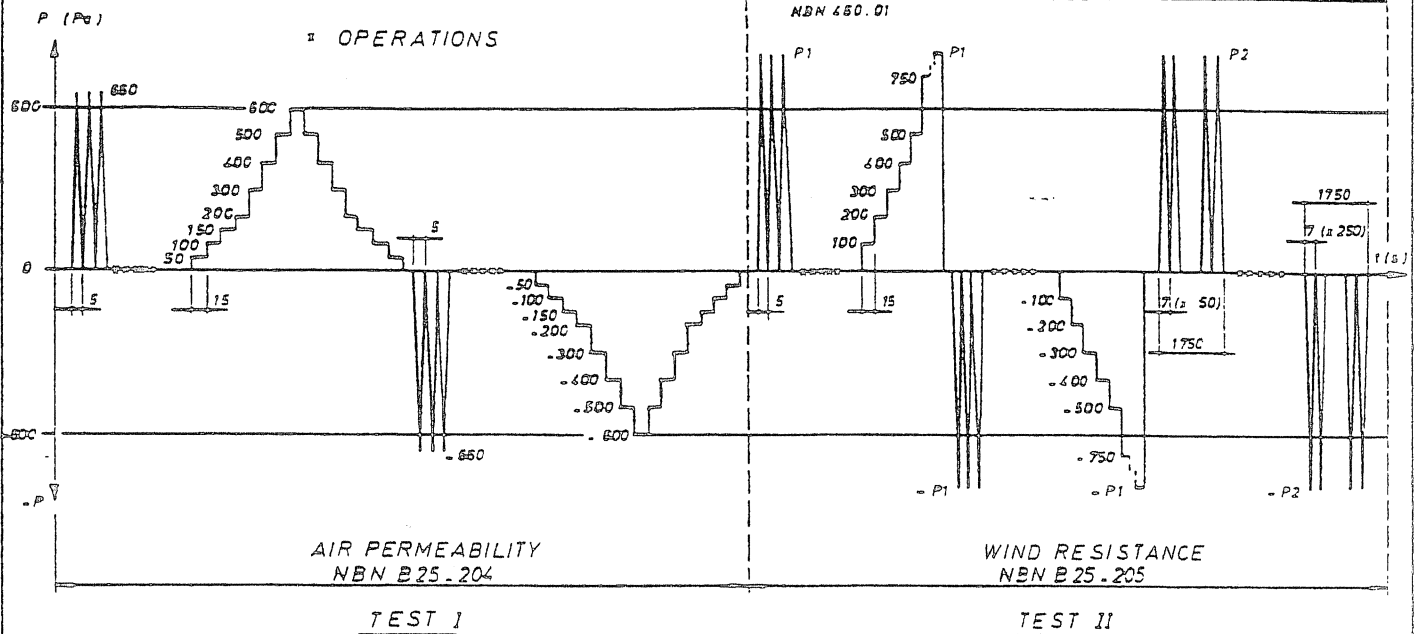
363/2341 /1 - 5

with stamp

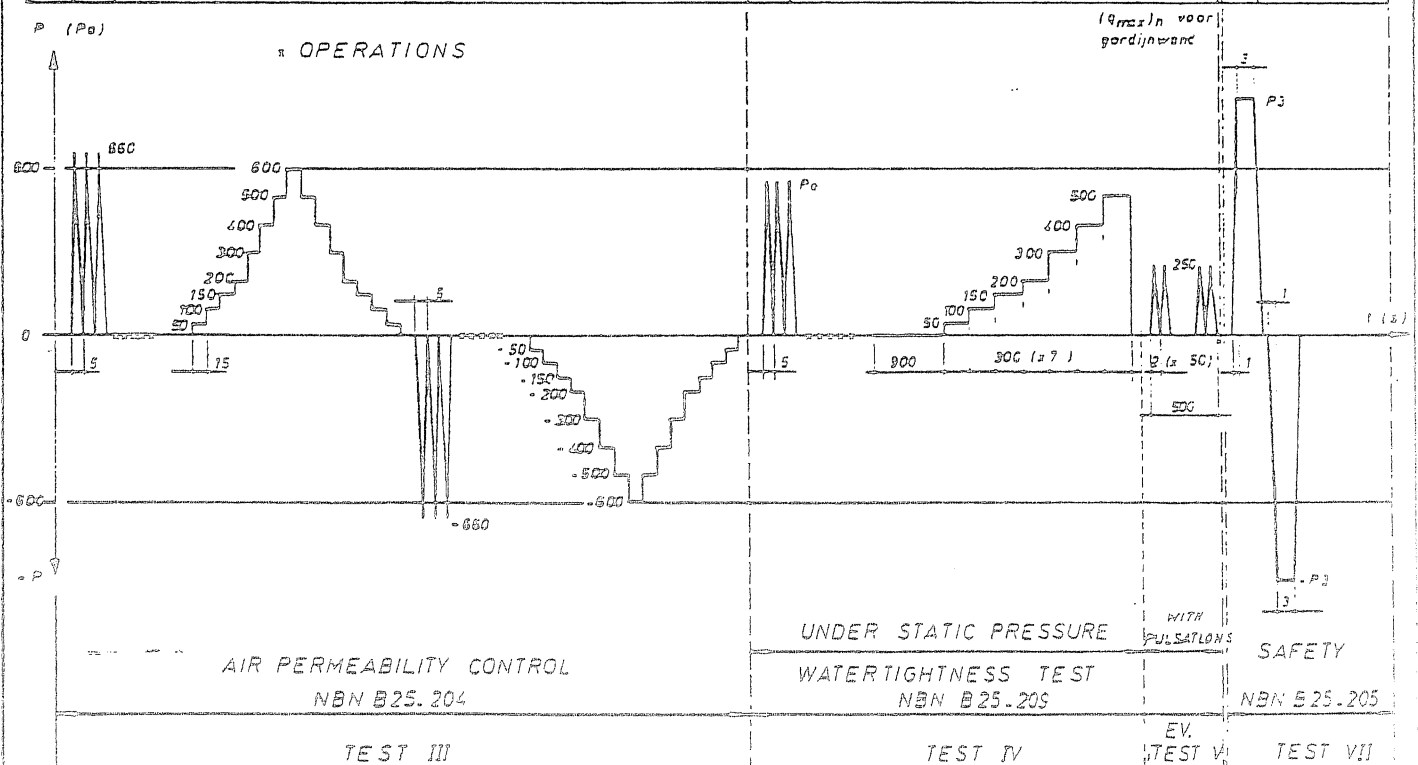
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PRESTATION NIVEAU	PA 2	500	300	- 500	- 300	PV 1	600	800	- 600	- 800	450	- 450
	PA 2B	550	500	- 550	- 500	PV 1B	750	750	- 750	- 750	600	- 600
	PA 3	660	600	- 660	- 600	PV 2	1000	1000	- 1000	- 1000	750	- 750
						PV 3	$\gamma p(q_{max})_n$ $\gamma p(q_{max})_n$ $\gamma p(q_{max})_n$ $\gamma p(q_{max})_n$ $\gamma p(q_{max})_n$ $\gamma p(q_{max})_n$					

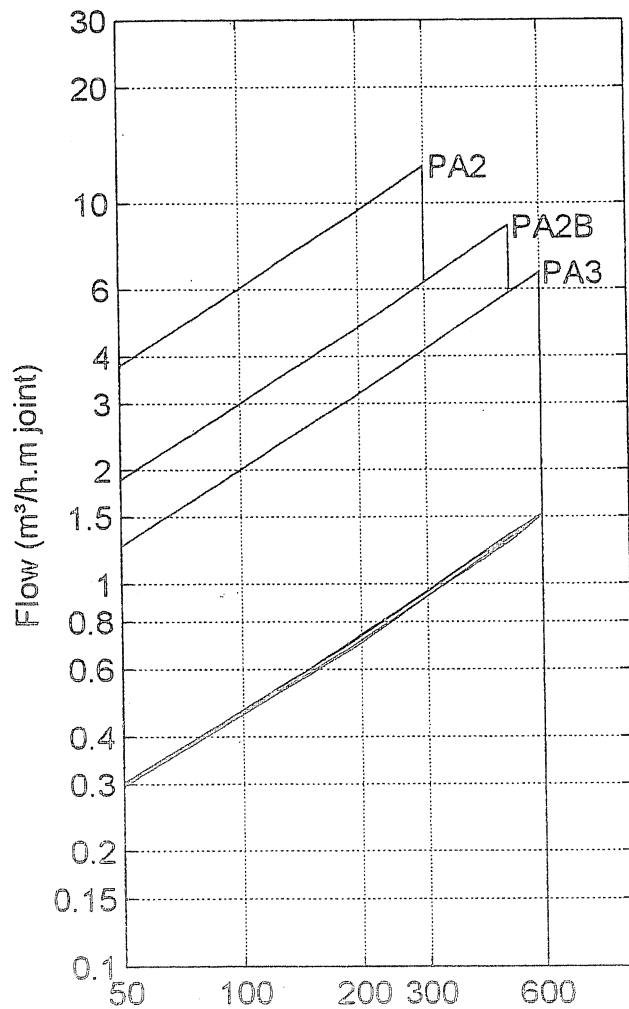


PRESTATION NIVEAU	PA 2	500	300	- 500	- 300	PE 2	500	150	(250)	PV 1	1000	-1000
	PA 2B	550	500	- 550	- 500	PE 3	500	300	(250)	PV 2	1500	-1500
	PA 3	660	600	- 660	- 600	PE 4	550	500	(250)	PV 3	2000	-2000
						PEE	$1,1 (q_{max})_n$ $(q_{max})_n$ (250)			PV 4	$\gamma p(q_{max})_n$	

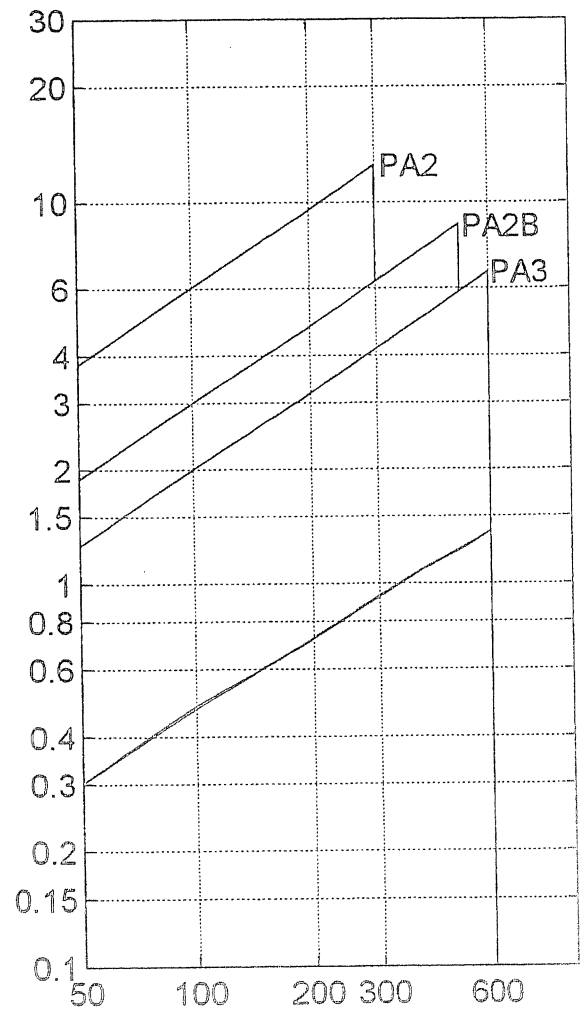


AIR PERMEABILITY IN ACCORDANCE
WITH NBN B25-204

POSITIVE PRESSURE



NEGATIVE PRESSURE

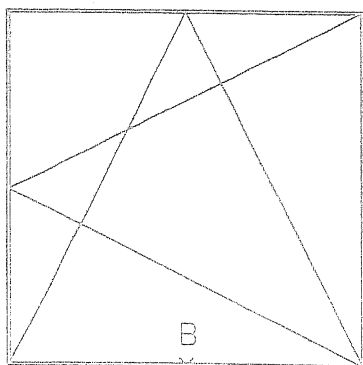
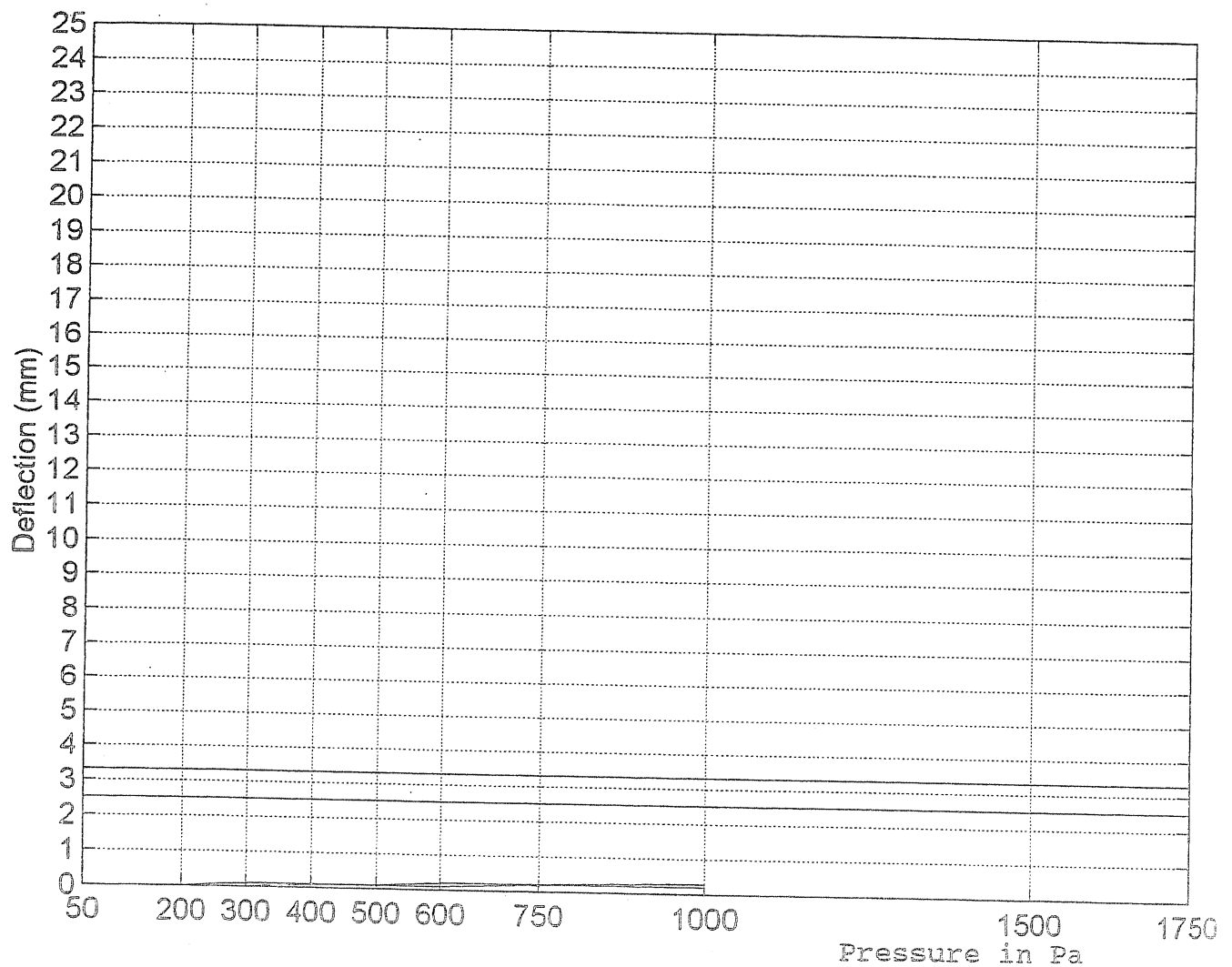


Ref. nr. 363/2341/1

Date: 98-06-09

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WIND RESISTANCE IN ACCORDANCE WITH
NBN B25-205



Ref. nr. 363/2341/2

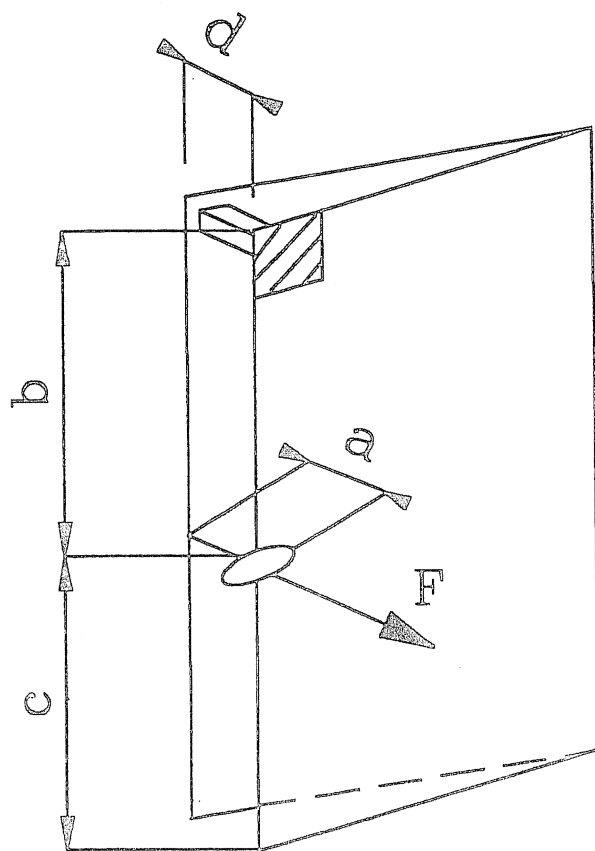
Date: 98-06-09

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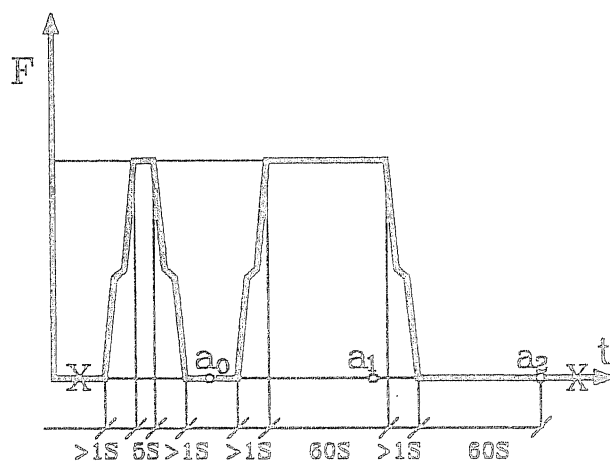
TORSIONAL DEFORMATION: Side hung, open out / in

$$b \geq c$$

$$d \leq 50 \text{ mm}$$



	Locked corner
	Displacement "a"
	Open & close



$$a_1 - a_0 = 30.9 \text{ mm}$$

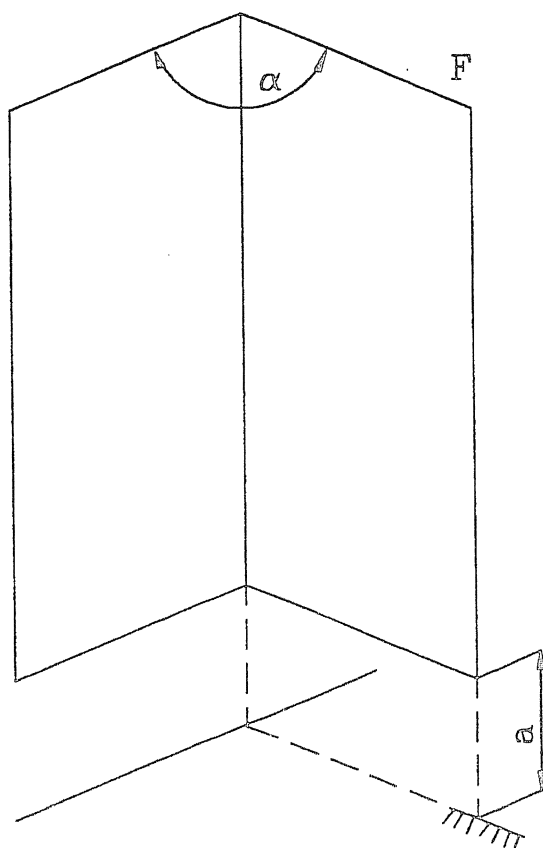
$$a_2 - a_0 = 0.0 \text{ mm}$$

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Ref.: 363/2341/3
Dat.: 1998 06 09

RESISTANCE TO RACKING: Side hung, open in

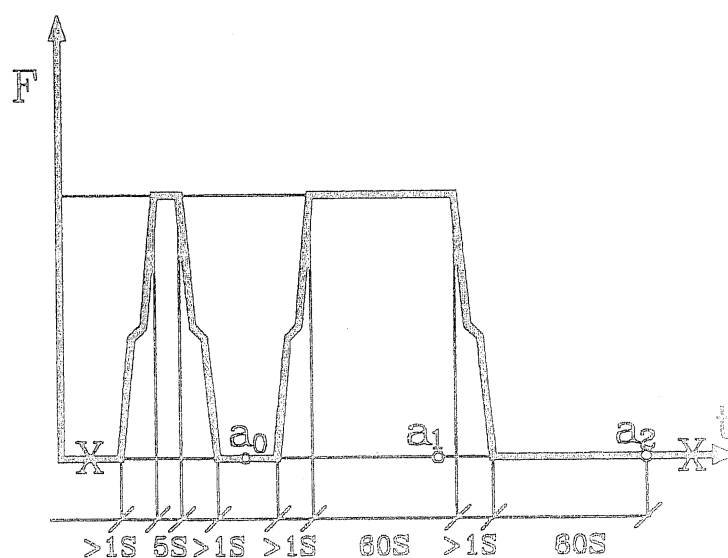
$$\alpha = 90^\circ \pm 5^\circ$$



O	Displacement "a"
X	Open & close

$$a_1 - a_0 = 0.4 \text{ mm}$$

$$a_2 - a_0 = 0.0 \text{ mm}$$

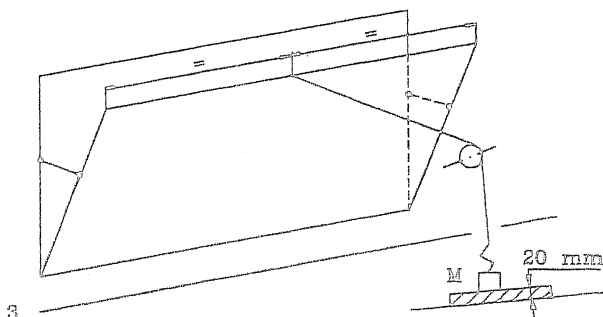
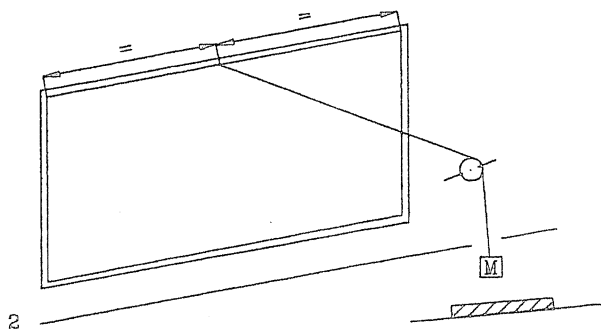
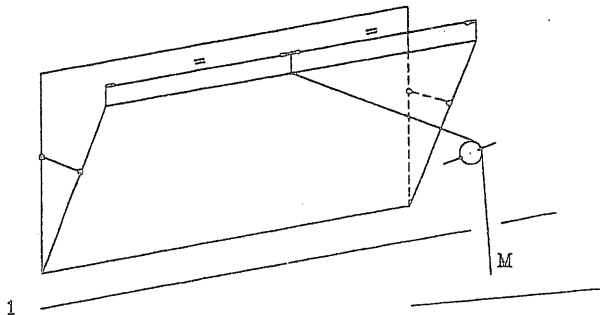


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Ref.: 363/2341/4
Dat.: 1998 06 09

TEST FOR STAYS:

Opened on hinges on a horizontal axle.



Length of cable = distance to the ground when passed through a pulley with the sash opened.

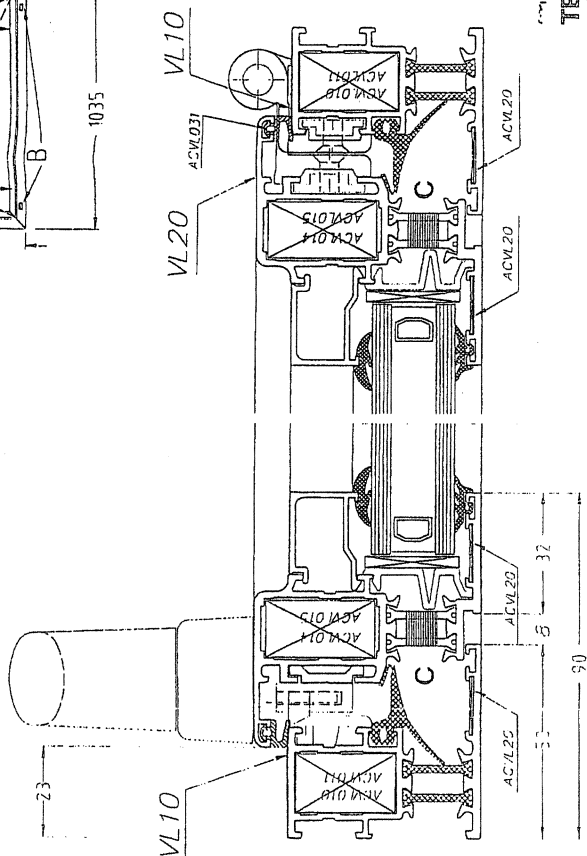
Fix a weight M at the centre of the top horizontal part of the sash. The weight is suspended on a metal cable attached at the fixation point. The length of the metal cable is to allow the weight to rest on the ground when the opener is tilted back (1).

Place a block of 20 mm thickness under the center point of impact, and then close the opener (2). The opening of the sash is speeded up by the weight M which touches the block before the opener falls to the ventilation position (3).

The opening is measured before and after the series of tests; the number of tests is 10.

Ref.:363/2341/5
Dat.:1998 06 09

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2341/2363

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