

**Universiteit
Gent**

**Testcentrum
voor
Gevelementen**

TEST REPORT NR. 363/2242

TEST CARRIED OUT IN ACCORDANCE WITH
STS 52.0 EDITION 1985

ON AN ALUMINIUM TURN AND TILT WINDOW
WITH THERMAL BREAK.

TEST



aliplast[®]
ALUMINIUM
SYSTEMS

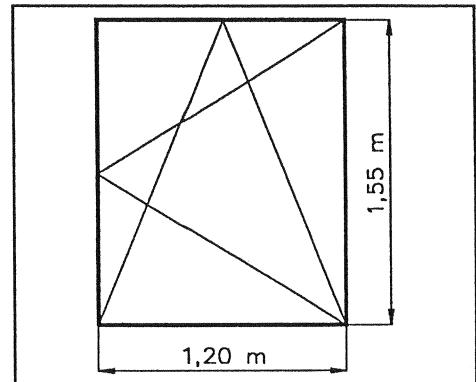
UNIVERSITEIT GENT
TESTCENTRUM VOOR GEVELELEMENTEN
DIENST: PROF. DR. IR. CH. VAN AKEN
.....

9000 GENT, 95-11-23
SINT-PIETERSNIEUWSTRAAT 41
TEL (09) 264 33 59
FAX (09) 264 35 90

TEST REPORT NR: 363/2242

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

OF THE COMPANY:
N.V. METALCHIMEX



1 APPLICANT:

N.V. METALCHIMEX

Waaslandlaan 32
9160 LOKEREN

Contact: M. Coeymans
Phone: 09 340 55 59

2 MANUFACTURER:

N.V. METALCHIMEX

Waaslandlaan 32
9160 LOKEREN

Phone: 09 340 55 59

DESTINATION: Aliplast

4 MATERIAL SENT FOR TEST:

4.1. Identification of the test element:

Test element supplied by the applicant on 95-11-16 and in accordance with the included drawing with ref. nr.: 363/2242
Drawing certified with the stamp:

4.2. Dimensions of the test element:

width : 1.20 m
height : 1.55 m
total surf.: 1.86 m²
length of the opening joints: 5.10 m
surface of the opening light frame: 1.60 m²

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4.3. Description of the parts of the test element:

Sections:

material : aluminium with thermal break
type : Aliplast
surface treatment : laquered
type of connection: glued and screwed

Tightening strips:

material: epdm
type : see drawing ref. nr. 363/2242
place : middle and inside

Glass:

thickness : double 8+12+6 mm
type : Eurotherm
way of glazing: pre-fabricated profils

Fittings:

hinges: mark : Metalchimex
type : Maxim-line
number: 2

closing fittings: mark: Metalchimex
type: Maxim-line
number of locking points: 11 + 1 on the arm

Drainage:

of the glazing : see drawing ref. nr. 363/2242
of the opening joint: see drawing ref. nr. 363/2242

Ventilating of the opening joint: see drawing ref. nr. 363/2242

5 INSTALLATION IN THE TEST CENTER:

The element to test is fixed on the test chamber in accordance with the included drawing nr.: 363/2242 and scheme 363/1/1.
Air temperature in the test chamber: 19.0 °C
Air temperature in the test center : 19.0 °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. 363/2242 /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.	0.71	0.14	0.44	0.38
100.	1.12	0.22	0.70	0.60
150.	1.46	0.29	0.91	0.78
200.	1.73	0.34	1.08	0.93
300.	2.29	0.45	1.43	1.23
400.	2.76	0.54	1.73	1.49
500.	3.19	0.62	1.99	1.71
600.	3.59	0.70	2.25	1.93
500.	3.19	0.62	1.99	1.71
400.	2.76	0.54	1.73	1.49
300.	2.27	0.44	1.42	1.22
200.	1.73	0.34	1.08	0.93
150.	1.46	0.29	0.91	0.78
100.	1.12	0.22	0.70	0.60
50.	0.71	0.14	0.44	0.38

6.1.2. Negative pressure see fig. 363/2242 /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.	0.71	0.14	0.44	0.38
100.	1.06	0.21	0.66	0.57
150.	1.42	0.28	0.88	0.76
200.	1.70	0.33	1.06	0.91
300.	2.18	0.43	1.36	1.17
400.	2.63	0.51	1.64	1.41
500.	3.02	0.59	1.89	1.63
600.	3.36	0.66	2.10	1.81
500.	2.94	0.58	1.84	1.58
400.	2.55	0.50	1.60	1.37
300.	2.09	0.41	1.31	1.13
200.	1.62	0.32	1.01	0.87
150.	1.32	0.26	0.83	0.71
100.	1.00	0.20	0.63	0.54
50.	0.61	0.12	0.38	0.33

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 0.50 m in point B see fig. 363/2242 /2:

Pressure Pa	Deformation 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.	0.0	0.0
500.	0.0	0.0
600.	0.0	0.0
750.	0.1	1./ 5000.
1000.	0.1	1./ 5000.
1500.	0.1	1./ 5000.
1750.	0.2	1./ 2500.

Permanent deformation: 0.0 mm

REMARK: none.

6.2.2. Deformation test by negative pressure measured over a lenght of 0.50 m in point B see fig. 363/2242 /2

Pressure Pa	Deformation 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.	0.0	0.0
500.	0.0	0.0
600.	0.0	0.0
750.	0.0	0.0
1000.	0.1	1./ 5000.
1500.	0.1	1./ 5000.
1750.	0.1	1./ 5000.

Permanent deformation: 0.0 mm

REMARK: none.

6.2.3. Repeated positive and negative pressure test from 0 to 1250. 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 363/2242 /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.	0.0	0.00
150.	0.0	0.00
200.	2.1	0.01
300.	0.0	0.00
400.	-0.8	0.00
500.	-1.2	-0.01
600.	-2.5	-0.02
500.	-1.2	-0.01
400.	-0.8	0.00
300.	0.0	0.00
200.	0.0	0.00
150.	0.0	0.00
100.	0.0	0.00
50.	0.0	0.00

6.3.2. Negative pressure see fig 363/2242 /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.	0.0	0.00
150.	0.0	0.00
200.	-2.2	-0.01
300.	-1.3	-0.01
400.	-1.8	-0.01
500.	-1.4	-0.01
600.	-0.6	0.00
500.	0.0	0.00
400.	0.0	0.00
300.	0.0	0.00
200.	0.0	0.00
150.	0.0	0.00
100.	0.0	0.00
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 m^3/hm
 opening joint) of the air permeability measured before the
 wind resistance test.

RESULT: the element is satisfactory.

6.4. 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
600	5	no infiltration
700	5	no infiltration
800	5	no infiltration
900	5	no infiltration
1000	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 : 151.6 N

6.5.2. Unlocking power: 137.0 N

6.5.3. Power necessary to start moving the opening light frame: 8.8 N

6.5.4. Power necessary to move the opening light frame: 2.6 N

6.5.5. Warp test: see fig. 363/2242 /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. /2242 /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. /2242 /5
The fall 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: 3000. Pa

RESULT:

There was no damage or faulty operation after the test.

6.6.2. Safety test with a negative pressure of: 3000. 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 : PV3
- watertightness : PEE 1000 Pa
- mechanical behaviour: the element is satisfactory

7.2. In accordance with UEATC:

class for

- air permeability : A3
- wind resistance : V3
- 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. Ch. VAN AKEN, director of the "Testcentrum voor Gevelelementen".

R. HUWEL
Engineer responsible for the tests.

Prof. Dr. Ir. Ch. VAN AKEN
Director.

ANNEXES:

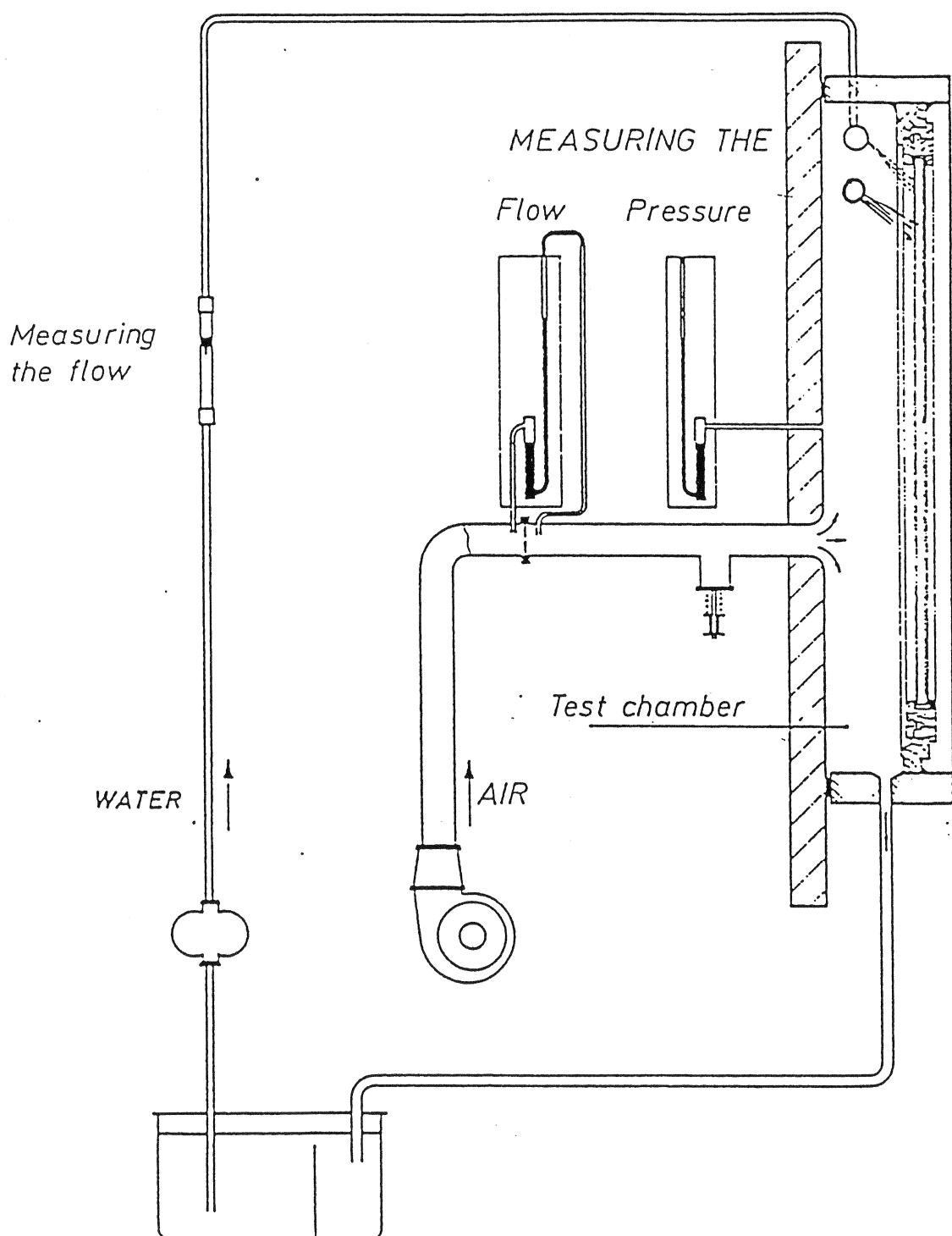
..... with stamp

Drawings nr.

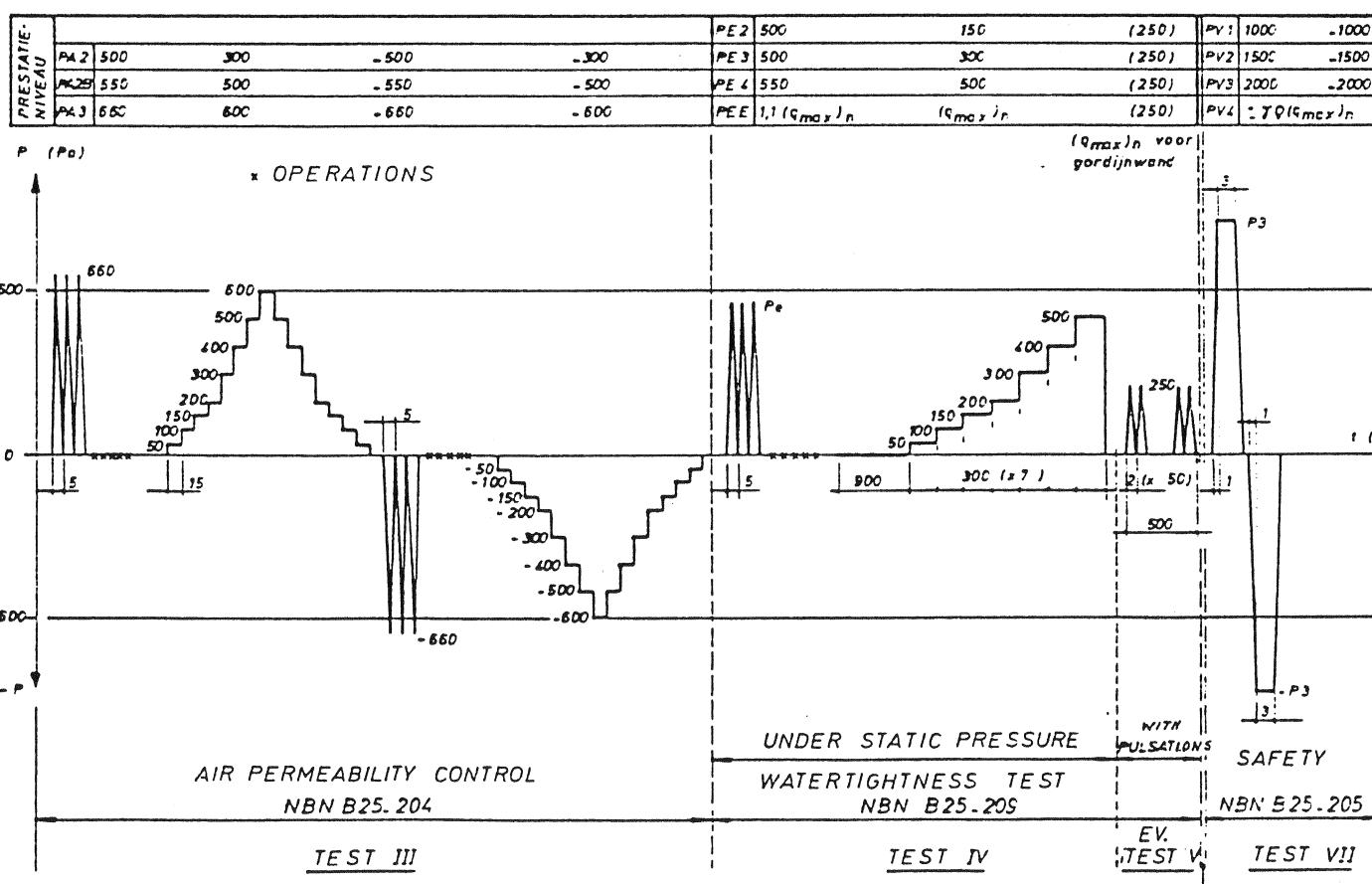
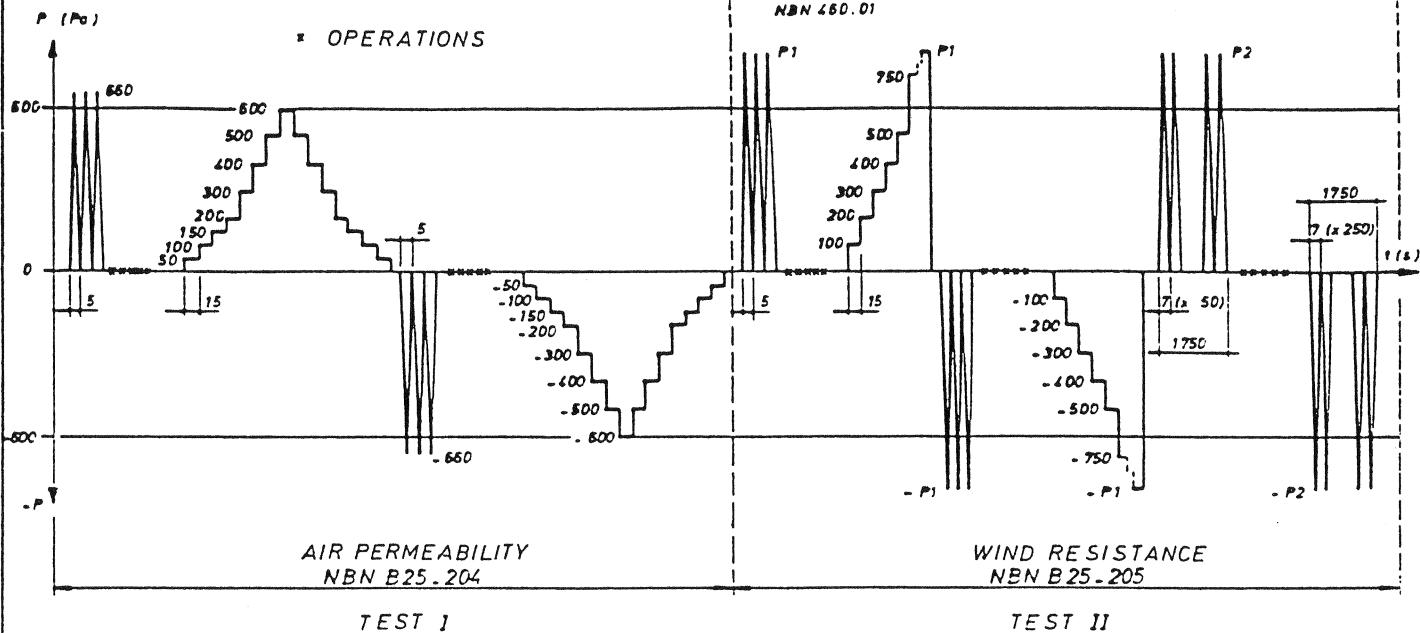
363/1/1
363/1/2
363/2242

Figures nr.

363/2242 /1 - 5



PRESTATIE-NIVEAU				PV1	600	600 - 600	- 600	650	- 650
PA2	500	300	- 500	PV1B	750	750 - 750	- 750	600	- 600
PA2B	550	500	- 550	PV2	1000	1000 - 1000	- 1000	750	- 750
PA3	650	600	- 650	PV3	1750 (q _{max}) _n	T P1 (q _{max}) _n T P2 (q _{max}) _n T P3 (q _{max}) _n	- T P1 (q _{max}) _n	- T P2 (q _{max}) _n	- T P3 (q _{max}) _n



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363 2242

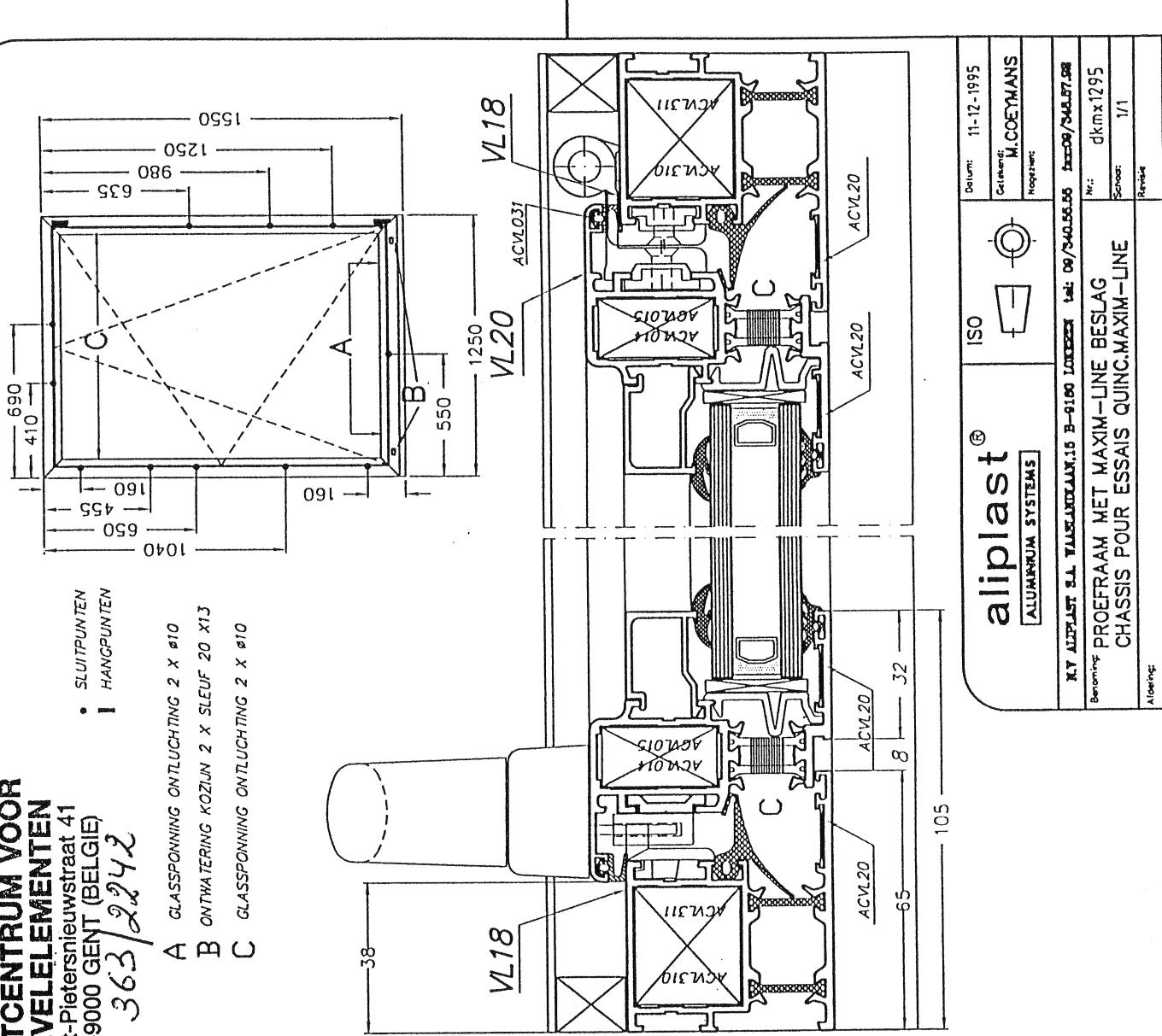
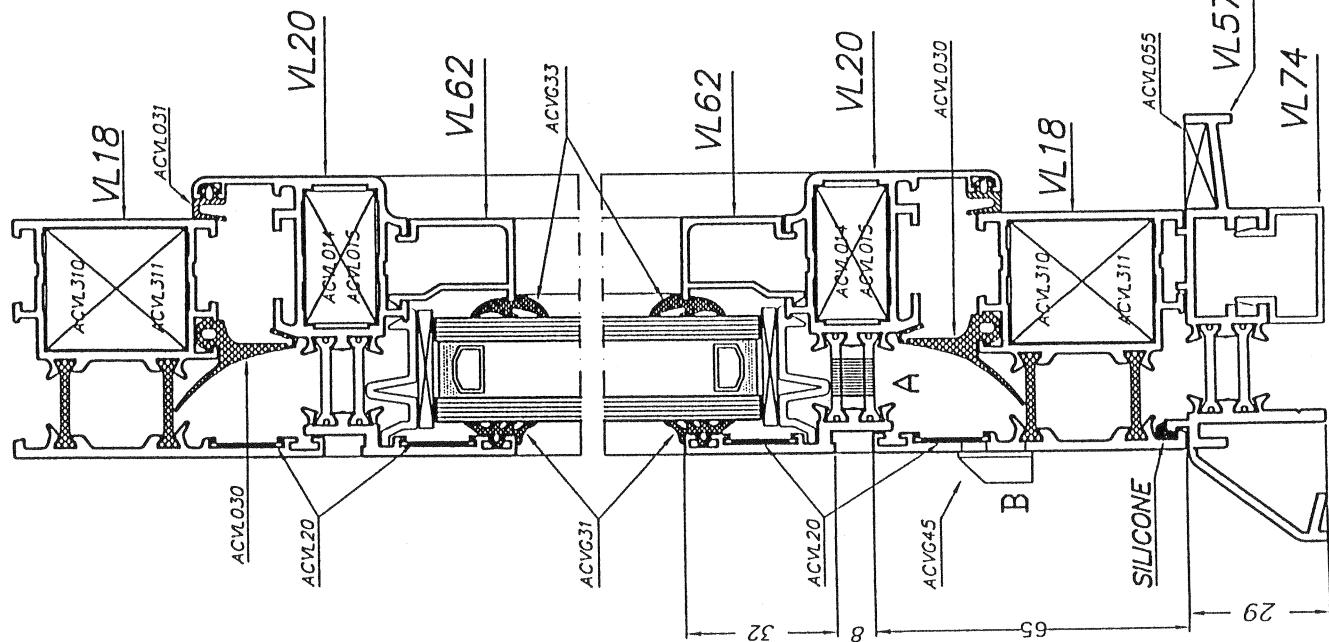
SLUITPUNTEN

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363/2242

A GLASSPONNING ONTLUCHTING 2 X ♂10
B ONTWERPING KOZIJN 2 X SLEUF 20 X13
C GLASSPONNING ONTLUCHTING 2 X ♂10

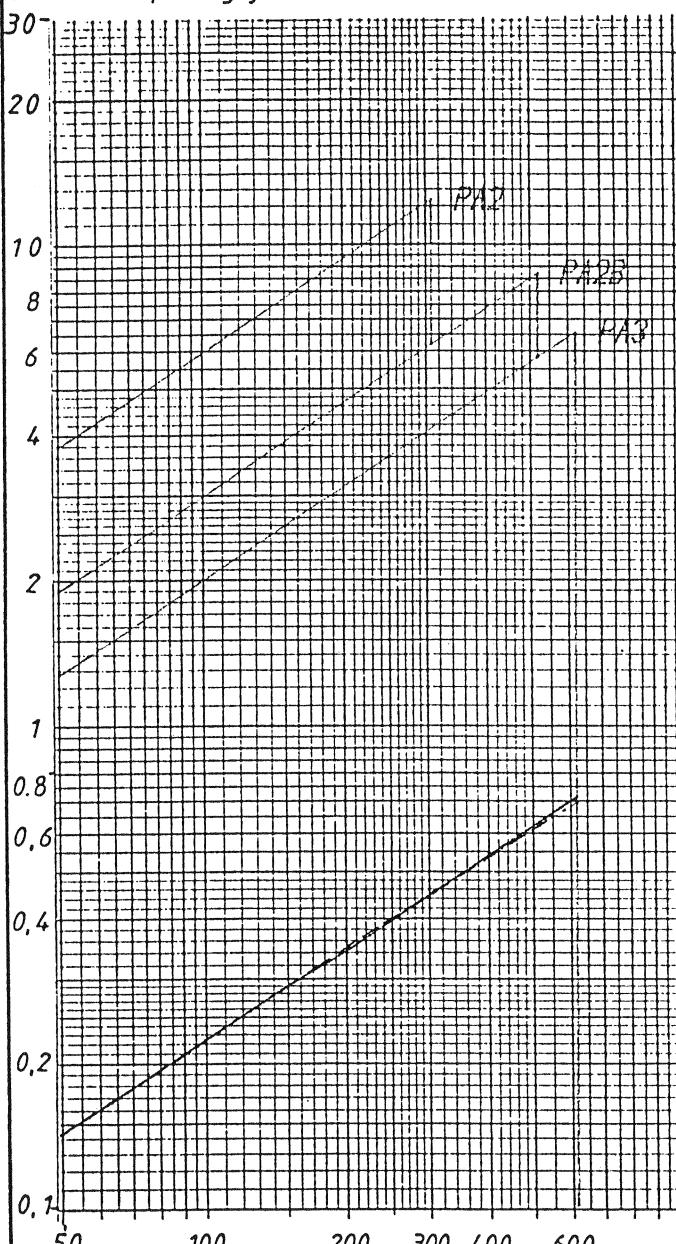


K.V ALPENST. 21. VLIETLANDAAN 16 B-9160 LOKEREN tel: 03/340.55.55 fax: 03/340.57.58
 Bedrijfsnaam: PROEFRAAM MET MAXIM-LINE BESLAG
 CHASSIS POUR ESSAIS QUINC.MAXIM-LINE
 M.: dkmx 1295
 School: 1/1
 Revisie

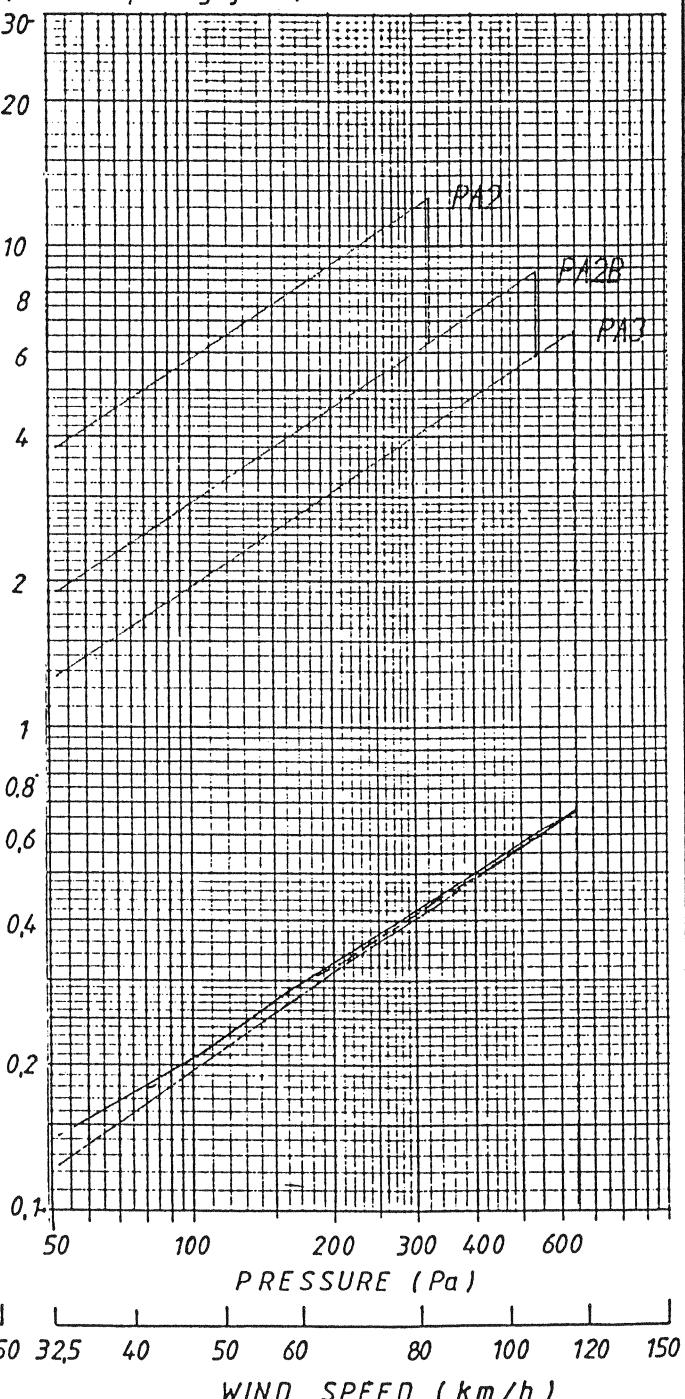
X
Banc

AIR PERMEABILITY IN ACCORDANCE WITH NBN B25-204POSITIVE PRESSURE

FLOW

(m³/h.m opening joint)NEGATIVE PRESSURE

FLOW

(m³/h.m opening joint)

— BEFORE

TESTING WIND RESISTANCE IN ACCORDANCE WITH NBN B25-205

---- AFTER

UNIVERSITEIT GENT TESTCENTRUM VOOR GEVELELEMENTEN Sint-Pietersnieuwstraat 41 B-9000 GENT (BELGIË)	AIR PERMEABILITY BY POSITIVE & NEGATIVE PRESSURE	Nr.: 363/ 2242/1
		Datum: 95 11 23

WIND RESISTANCE IN ACCORDANCE
WITH NBN B 25 - 205

DEFLECTION
(mm)

15

10

5

0

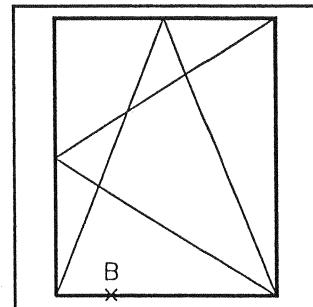
Pressure
positive
negative

500

1000

1500

PRESSURE DIFFERENCE Pa



WATERTIGHTNESS IN ACCORDANCE WITH NBN B 25 -209

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WIND RESISTANCE

Nr.: 363/2242 /2

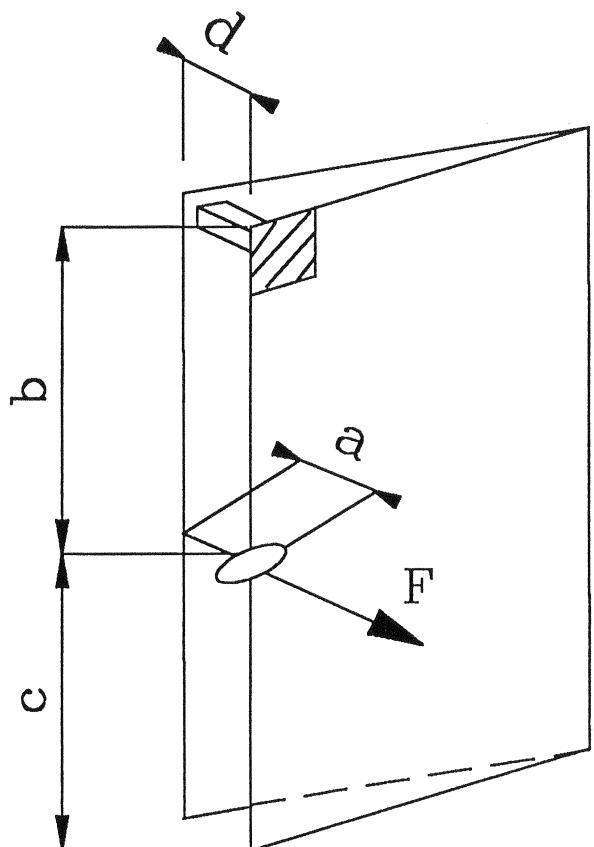
WATERTIGHTNESS

Datum: 95 11 23

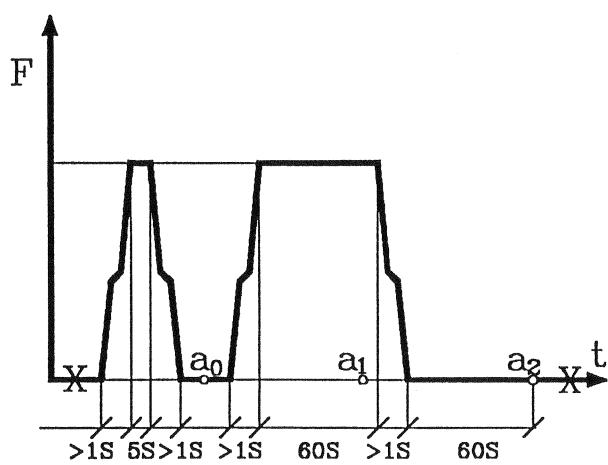
TORSIONAL DEFORMATION: Side hung, open out / in

$b \geq c$

$d \leq 50 \text{ mm}$



	Locked corner
	Displacement "a"
	Open & close



$$a_1 - a_0 = 3.9 \text{ mm}$$

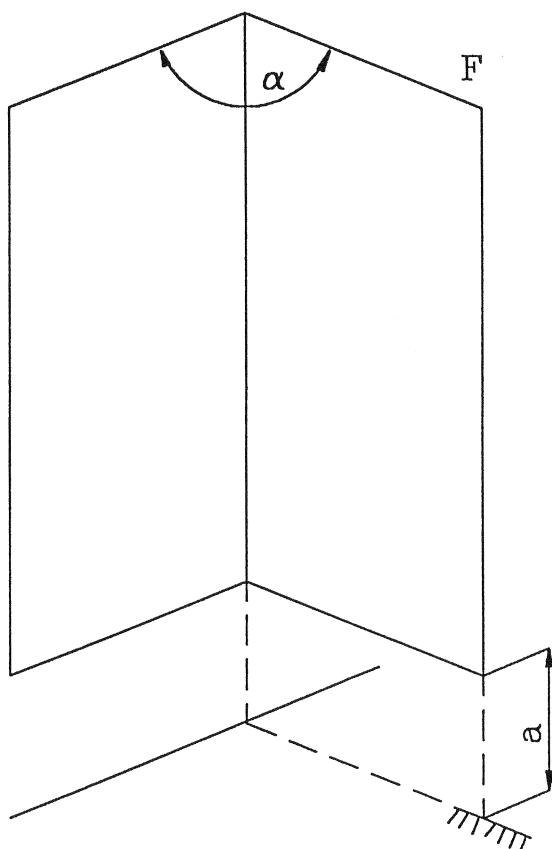
$$a_2 - a_0 = 0.0 \text{ mm}$$

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Ref.:363/2242/3
Dat.:1995 11 23

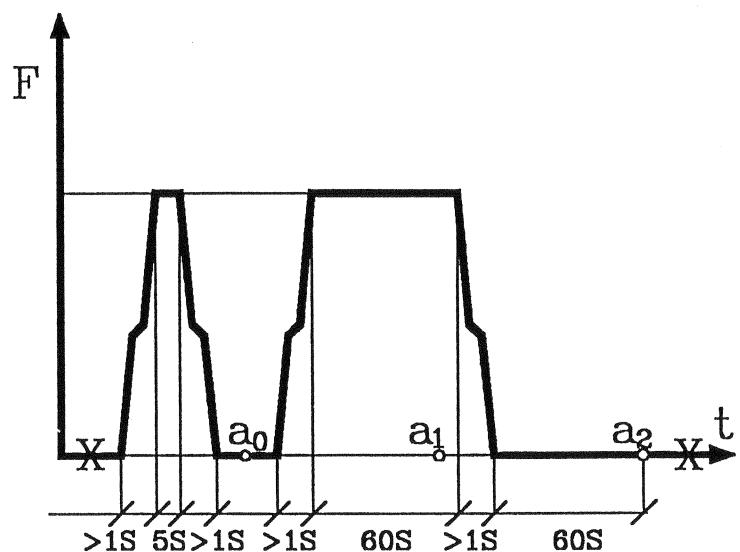
RESISTANCE TO RACKING: Side hung, open in

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



O	Displacement "a"
X	Open & close

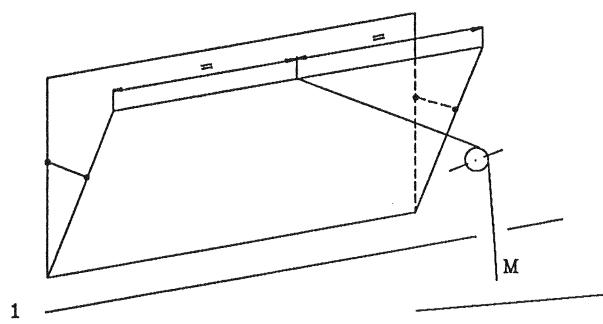
$$\begin{aligned} a_1 - a_0 &= 1.6 \text{ mm} \\ a_2 - a_0 &= 0.0 \text{ mm} \end{aligned}$$



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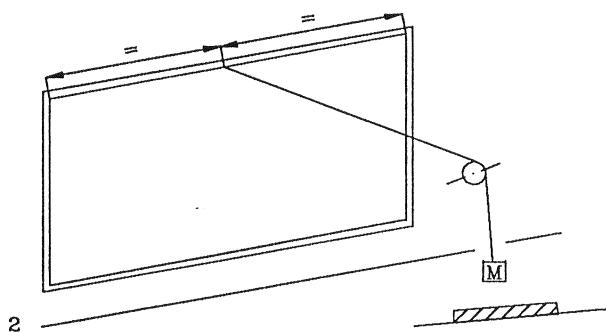
Ref.: 363/2242/4
Dat.: 1995 11 23

TESTING THE LINK ARM AND HINGES:
Opened on hinges on a horizontal axle.



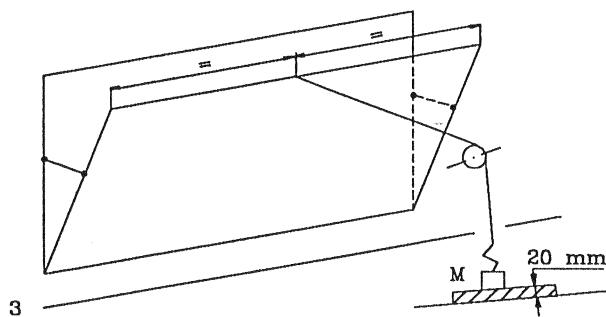
Length of cable = distance to the ground when passed through a pulley with the sash opened.

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.: 363/2242/5
Dat.: 1995 11 23