

Test Report
No. 11-002134-PR01
(PB-A01-02-en-01)

Client WINDOWS 2000
ul. Sobieskiego 23
84-230 Rumia
Poland

Product Single leaf tilt and turn window

Designation IV 88

Performance-relevant product details Wood – Meranti

Overall dimensions (W x H) 1,230 mm x 1,480 mm

Special features Locking points under maximum hold

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 E1350

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

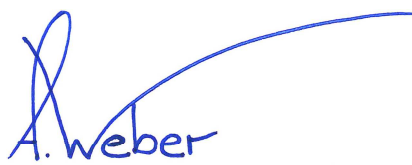


Class C5 / B5

ift Rosenheim
05.04.2012



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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.

Contents

The report contains a total of 20 pages.



1. Object

1.1 Description of test specimen

Single tilt and turn window

Manufacturer	Windows 2000
System	IV 88
Material	Wood - meranti
Type of opening	tilt and turn
Opening direction	DIN left, inward opening

Frame member

Supply designation/ type / Item No.	Dimensions (W x H): 88 mm x 81 mm
Overall dimensions (W x H)	1,230 mm x 1,480 mm
Connection type	Tenon and mortice joints

Casement member

Supply designation/ type / Item No.	Dimensions (W x H): 88 mm x 81 mm
Overall dimensions (W x H)	1,153 mm x 1,388 mm
Connection type	Tenon and mortice joints
Additives/ optional components	Drip rail, Gutmann - SPREE 27 OF, screwed und clipped, with additional sealing profile, TPE, D 190 F, horizontal
Weight in kg	52

Rebate design

Pressure equalisation	Without external gasket
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Centre seal

Supply designation/ type / Item No.	SP 6850
Material	Sealing material – TPE
Corner configuration	continuous, notched in corners, at top centre butt-jointed and bonded

Rebate seal internal

Supply designation/ type / Item No.	SP 103
Material	Sealing material – TPE
Corner configuration	continuous, notched in corners, at top centre butt-jointed and bonded

Insulating glass unit 3-point

Thickness in mm	48
Configuration in mm	float 4 / space 18 / float 4 / space 18 / float 4

Installation of infills

Vapour pressure equalisation	on hinge and locking side 2 slots 4,0 mm x 7,0 mm at bottom and top
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Glazing gasket external

Supply designation/ type / Item No.	Dow Corning 796
Material	Sealing material - silicone
Corner configuration	wet glazing



Glazing gasket internal

Item No. Dow Corning 796
Material Sealing material - silicone
Corner configuration wet glazing

Glazing bead

Supply designation/ type / Item No. Dimensions (W x H): 23 mm x 23 mm
Connection type mitred and jointed
Ficture nailed

Hardware

Manufacturer Roto Frank AG, Leinfelden-Echterdingen
Supply designation/ type / Item No. Roto NT
Type of opening Tilt and turn
Opening directions DIN left, inward opening
Hinges / bearings 1 tilt mechanism pivot
1 corner pivot
Number of locks at bottom 2, at top 2, on hinge side 2, on lock side 2
Maximum locking distance in mm 750
Tilt mechanism length in mm 480
Position of locks Locking points under maximum hold

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: WINDOWS 2000, 84-230 Rumia (Poland)
Date: 08.03.2012
Verification: A sampling report has been provided to the ift.
Delivered on: 13.03.2012
ift-Pk-Number: 11-002134-PK01 / WE: 32040-001



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

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

Test Report No. 11-002134-PR01 (PB-A01-02-en-01) dated 05. April 2012
Client: WINDOWS 2000, 84-230 Rumia (Poland)

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.

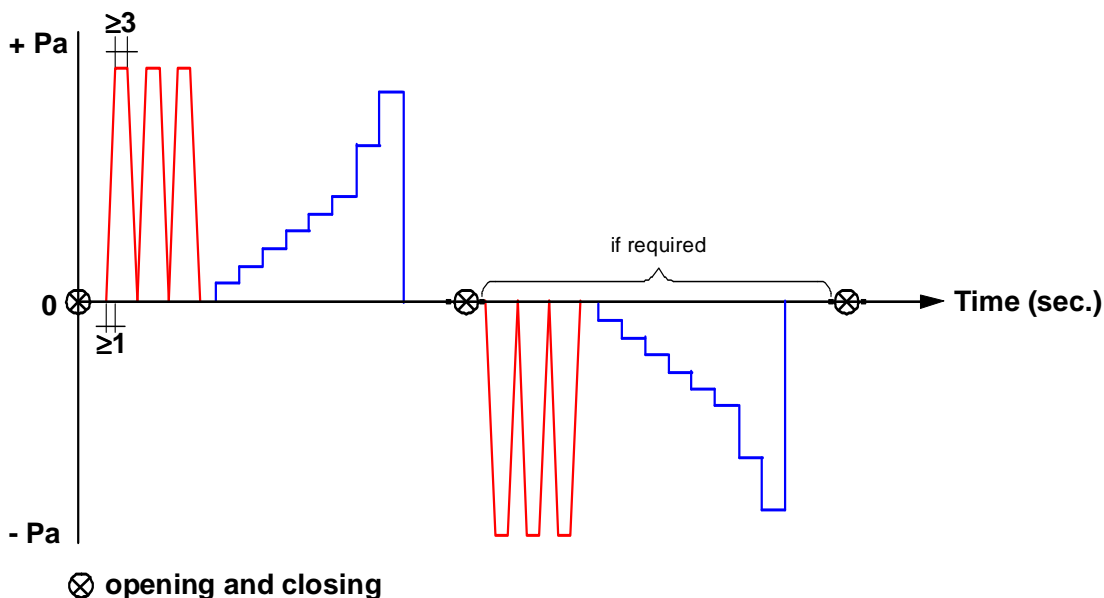


Illustration Test sequence for air permeability

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Client: WINDOWS 2000, 84-230 Rumia (Poland)

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.

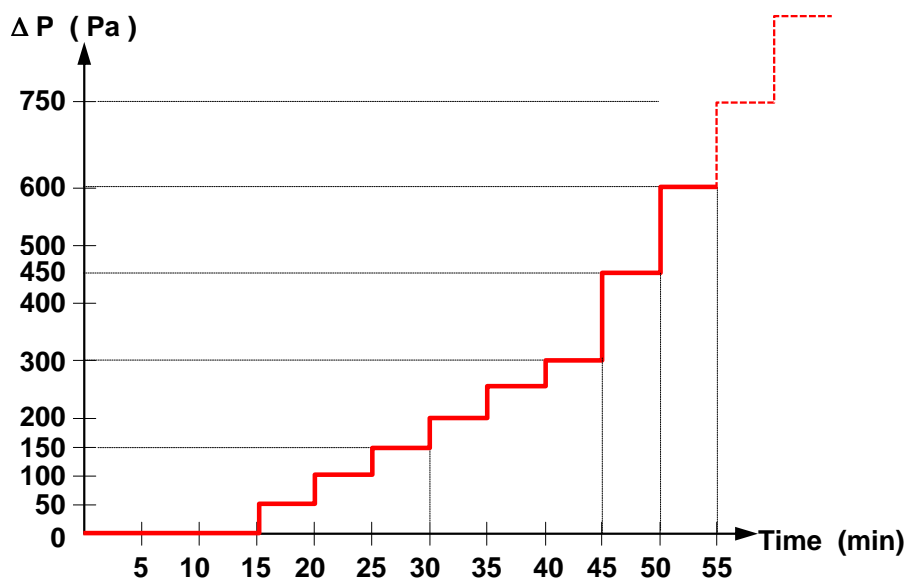


Illustration Test sequence for watertightness

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Client: WINDOWS 2000, 84-230 Rumia (Poland)

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 $\Delta p_3 = p_1 + 50\%$.

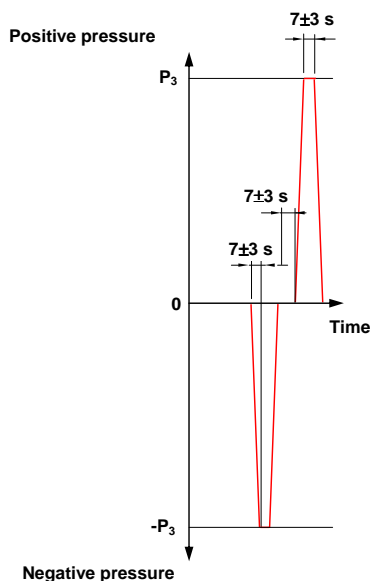


Illustration Test sequence for safety test

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.

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Client: WINDOWS 2000, 84-230 Rumia (Poland)

3. Detailed results

Air permeability - Test according to EN 1026

Projekt-Nr. 11-002134-PR01 Vorgang Nr. 11-002134
Client WINDOWS 2000
Basis of test EN 1026:2000-06
Windows and doors - Air permeability - Test method

Used test equipment Pst/020591 - LWW-Prüfstand 2
DM/020143 - Drehmomentmessgerät TT1
Test specimen Single leaf tilt and turn window

Test specimen No. 32040-001
Date of test 13.03.2012
Responsible test engineer Andreas Weber
Tester Stephan Hauscher

Information to test assembly and testing method

Testing method There were no deviations from test method or test conditions.

Ambience conditions Temperature 20 °C Air humidity 52 % Atmospheric pressure 977 hPa
The ambience conditions are as specified by standard requirements.

Testing procedure

Size of window frame 1230 mm x 1480 mm
Size of active leaf 1153 mm x 1388 mm
Area of test specimen 1,82 m²
Length of opening joints 5,08 m

Table: Measurement of operating forces

Individual measured result	1	2	3	Average value
in Nm	16,1	16,5	16,0	16,2

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 ³ /h	1,16	0,65	0,45	0,65	0,84	1,03	1,41	1,69
	Joint length-related	m ³ /hm	0,23	0,13	*)	0,13	0,17	0,20	0,28	0,33
	Overall area-related	m ³ /hm ²	0,64	0,36	*)	0,36	0,46	0,57	0,77	0,93

*) The measurement values are under the measuring ranges from the flow rate sensor

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	1,04	0,60	0,60	0,74	0,90	0,96	1,32	1,63
	Joint length-related	m ³ /hm	0,20	0,12	0,12	0,15	0,18	0,19	0,26	0,32
	Overall area-related	m ³ /hm ²	0,57	0,33	0,33	0,41	0,49	0,53	0,73	0,90



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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	1,10	0,63	0,53	0,70	0,87	1,00	1,37	1,66
Joint length-related	m ³ /hm	0,22	0,12	0,10	0,14	0,17	0,20	0,27	0,33
Overall area-related	m ³ /hm ²	0,60	0,34	0,29	0,38	0,48	0,55	0,75	0,91

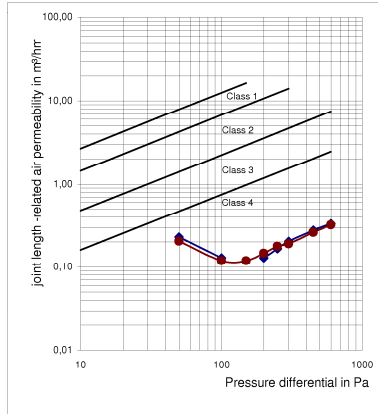


Diagram: Joint length-related air permeability (positive and negative wind pressures)

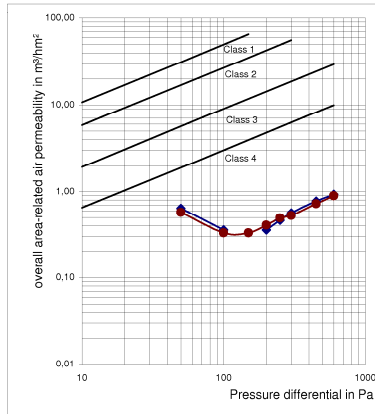


Diagram: Overall area-related air permeability (positive and negative wind pressures)

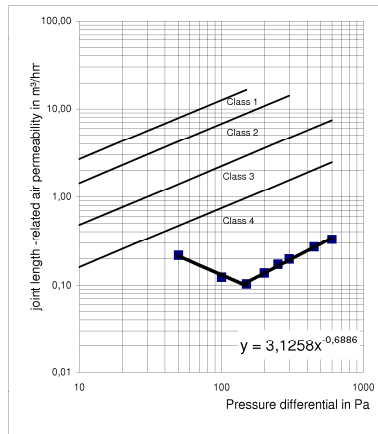


Diagram: Joint length-related air permeability (average value from positive and negative wind pressures)

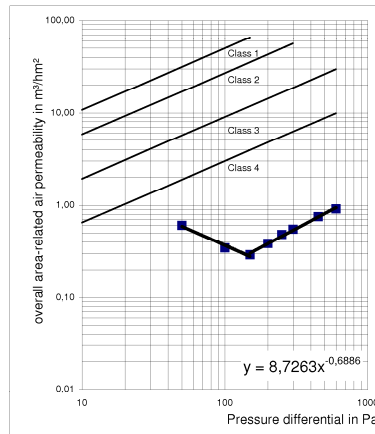


Diagram: Overall area-related air permeability (average value from positive and negative wind pressures)

Table: Measured results

Reference air permeability related to joint length	Q100 = 0,13 m ³ /hm
Reference air permeability related to overall area	Q100 = 0,37 m ³ /hm ²

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Client: WINDOWS 2000, 84-230 Rumia (Poland)

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

Projekt-Nr. 11-002134-PR01 Vorgang Nr. 11-002134
Client WINDOWS 2000
Basis of test EN 1026:2000-06
Windows and doors - Air permeability - Test method

Used test equipment Pst/020591 - LWW-Prüfstand 2
Test specimen Single leaf tilt and turn window

Test specimen No. 32040-001
Date of test 13.03.2012
Responsible test engineer Andreas Weber
Tester Herbert Hageneder

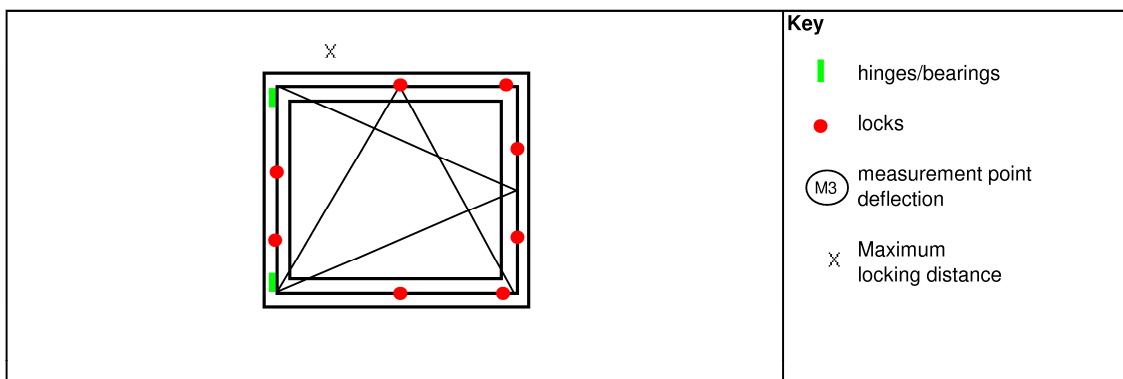
Information to test configuration / Test method

Test method There were no deviations from test method or test conditions.

Ambience conditions Temperature 20 °C Air humidity 52 % Atmospheric 977 hPa

The ambience conditions are as specified by standard requirements.

Testing procedure





Test Report No. 11-002134-PR01 (PB-A01-02-en-01) dated 05. April 2012
Client: WINDOWS 2000, 84-230 Rumia (Poland)

Repeat test of air permeability - Test according to EN 1026

Projekt-Nr. 11-002134-PR01 Vorgang Nr. 11-002134
Client WINDOWS 2000
Basis of test EN 1026:2000-06
Windows and doors - Air permeability - Test method

Used test equipment Pst/020591 - LWW-Prüfstand 2
Test specimen Single leaf tilt and turn window

Test specimen No. 32040-001
Date of test 13.03.2012
Responsible test engineer Andreas Weber
Tester Stephan Rauscher

Information to test configuration / Test method

Test method There were no deviations from test method or test conditions.

Ambience conditions Temperature 20 °C Air humidity 52 % Atmospheric 977 hPa

The ambience conditions are as specified by standard requirements.

Testing procedure

Size of window frame 1230 mm x 1480 mm
Size of active leaf 1153 mm x 1388 mm
Area of test specimen 1,82 m²
Length of opening 5,08 m

Subsequent to the test of resistance of wind load by application of test pressure 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

The requirements were fulfilled.



Watertightness - Test according to EN 1027

Projekt-Nr. 11-002134-PR01 Vorgang Nr. 11-002134
Client WINDOWS 2000
Basis of test EN 1026:2000-06
Windows and doors - Air permeability - Test method

Used test equipment Pst/020591 - LWW-Prüfstand 2
Test specimen Single leaf tilt and turn window

Test specimen No. 32040-001
Date of test 13.03.2012
Responsible test engineer Andreas Weber
Tester Stephan Rauscher

Information to test assembly and testing method

Testing method There were no deviations from test method or test conditions.

Ambience conditions Temperature 20 °C Air humidity 52 % Atmospheric pressure 977 hPa
The ambience conditions are as specified by standard requirements.

Testing procedure

Size of window frame 1230 mm x 1480 mm
Number of spray nozzles 3 Lower nozzle line
Water amount 360 l/h Water amount 0 l/h
0,36 m³/h 0 m³/h

Spray method A

No water penetration at up to 1350 Pa detected.



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 Client: WINDOWS 2000, 84-230 Rumia (Poland)

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

Projekt-Nr. 11-002134-PR01 Vorgang Nr. 11-002134
 Client WINDOWS 2000
 Basis of test EN 1026:2000-06
 Windows and doors - Air permeability - Test method

Used test equipment Pst/020591 - LWW-Prüfstand 2
 Test specimen Single leaf tilt and turn window

Test specimen No. 32040-001
 Date of test 13.03.2012
 Responsible test engineer Andreas Weber
 Tester Stephan Rauscher

Information to test assembly and testing method

Testing method There were no deviations from test method or test conditions.

Ambience conditions Temperature 20 °C Air humidity 52 % Atmospheric pressure 977 hPa
 The ambience conditions are as specified by standard requirements.

Safety test

Table: Pressure steps

p ₃	Pa	Positive wind pressure					Negative wind pressure				
		600	1200	1800	2400	3000	-600	-1200	-1800	-2400	-3000
passed						✓					✓

Safety test passed at up to p₃ ± 3000 Pa.

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Client: WINDOWS 2000, 84-230 Rumia (Poland)



Load-bearing capacity of safety devices - according to EN 14609

Project-No.	11-002134-PR01	Vorgang Nr.	11-002134
Client	WINDOWS 2000		
Basis of test	EN 14609:2004-06 Windows - Determination of the resistance to static torsion		
Used test equipment	W/020155 - Hängewaage HCB200K100		
Test specimen	Single leaf tilt and turn window		
Test specimen No.	32040-001		
Date of test	14.03.2012		
Responsible test engineer	Andreas Weber		
Tester	Dariusz Janikowski		

Information to test assembly and testing method

Testing method There were no deviations from test method or test conditions.

Ambience conditions Temperature 20 °C Air humidity 56 %

The ambience conditions are as specified by standard requirements.

Testing procedure

The testing of the safety device is carried out with a load of 350N for 60s at the tilt mechanism pivot.
No damages or malfunctions should occur at the test specimen

Malfunctions at test specimen

At the test specimen were no malfunctions detected.

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Fig. 1
Test specimen



Fig. 2
Middle gasket and internal rebate seal, corner design



Fig. 3
Drip rail, connection detail



Fig. 4
Tilt mechanism pivot, seen from rebate



Fig. 5
Corner pivot, seen from rebate

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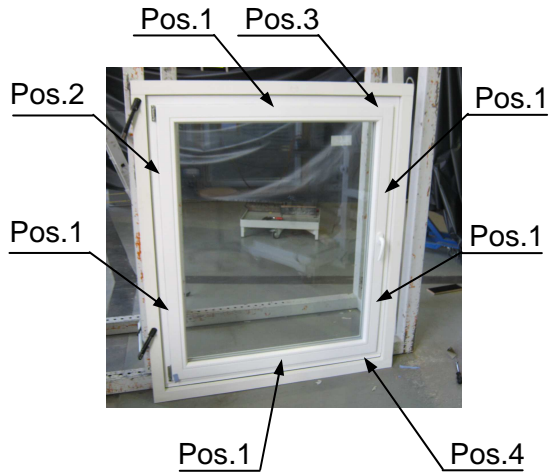


Fig. 6
Position of locks



Fig. 7
Locking situation frame Pos.1



Fig. 8
Locking situation casement Pos.1



Fig. 9
Locking situation frame Pos.2



Fig. 10
Locking situation casement Pos.2



Fig. 11
Locking situation frame Pos.3



Fig. 12
Locking situation casement Pos.3

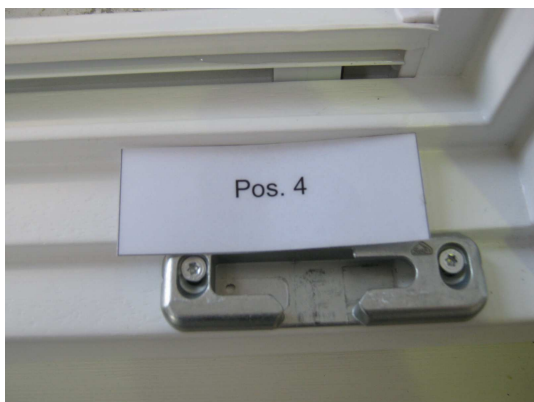


Fig. 13
Locking situation frame Pos.4



Fig. 14
Locking situation casement Pos.4