

Evidence of Performance

Resistance to wind load
Watertightness
Air permability
Operating forces

Test Report 102 32005/2e

This is a translation of Test Report 102 32005/2 dated 2 October 2006

Client **ERNE AG Holzbau
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Werkstraße 3**

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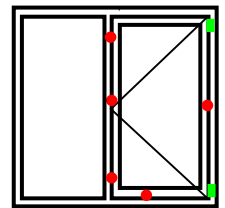
Basis

EN 14351-1 : 2006-03,
Windows and external doors –
Product standard

Test standards:

EN 1026 : 2000-06
EN 1027 : 2000-06
EN 12211 : 2000-06
EN 12046-1 : 2003-11

Representation



Product	Single side-hung window with fixed side light
Designation	Vision 3000 T2
Overall dimensions (W x H)	1230 mm x 1480 mm
Frame material	Wood profiles (pine) with external aluminium cladding
Special features	-/-

Instruction for use

The present test report serves to demonstrate the above characteristics of windows according to EN 14351-1 : 2006-03.

Validity

The data and results provided refer solely to the tested and described specimen.

Subject to compliance with the relevant casement weights, the test results can be extrapolated for constructions of identical or smaller dimensions of the same design, type of rebate and similar format.

This test does not allow any statement to be made on further characteristics of the present structure regarding performance and quality, in particular the effects of weathering and ageing.

Resistance to wind load – EN 12210



Class C5/B5

Watertightness – EN 12208



Class 9A

Air permeability – EN 12207



Class 4

Operating forces – EN 13115



Class 2

ift Rosenheim
09 October 2006

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Publishing notes

The **ift-Guidance Sheet** „Conditions and Guidance for the Use of **ift** Test Documents“ applies.

The cover sheet can be used as an abstract.

Contents

The report contains a total of 11 Pages

- 1 Object
- 2 Procedure
- 3 Detailed results



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TGA-ZM-16-93-60

1 Object

1.1 Description of test specimen

Product	Single side-hung window with fixed side light
Manufacturer	ERNE AG Holzbau
Date of manufacture	August 2006
System	Vision 3000 T2
Type of opening / opening directions	Tilt / DIN right , inwards
Frame material	Wood profiles (pine) with external aluminium cladding
Overall frame dimensions (W x H)	1230 mm x 1480 mm
Overall casement dimensions (W x H)	577 mm x 1412 mm
Casement weight	Approx. 17 kg
Frame member	Further details - see drawings
Frame joints	Wood profiles: tenon-mortise joint, glued and compressed Aluminium: butt-jointed profiles clipped to wood profiles, bottom joint of vertical cladding provided with elastic sealant
Additional profiles	Mullion
Frame joints	Wood profiles: secured by locknut, screw-fixed Aluminium profiles: from inside, screw-fixed behind gasket
Casement member	Further details - see drawings
Frame joints	Wood profiles: tenon-mortise joint, glued and compressed Aluminium: profiles mitre-cut and mechanically connected using corner brackets
Rebate design	
Rebate drainage	2 slots 6 mm x 36 mm downwards to outside
Rebate seal (Material, manufacturer, corner design)	Article numbers – see drawings
External	Black EPDM by Messrs. Dätwyler AG, mitre-cut and bonded, at corners at bottom below the gasket 2 cm each sealed with flexible sealant
Centre	Black EPDM by Messrs. Deventer AG, mitre-cut and bonded
Infill	Insulating glass unit, configuration – see drawings
Incorporation of infills	
Glazing gaskets (Material, manufacturer, corner configuration)	
External	Casement: black EPDM by Messrs. Trelleborg GmbH, continuous, top jointed at centre and bonded Fixed light: black EPDM by Messrs. Trelleborg GmbH, mitre-cut and welded
Internal	Gunned sealant white silicone by Messrs. Dow Corning SA



Vapour pressure equalization Casement and fixed light: Continuous joint of approx. 2 mm between external metal clipped profile and casement frame. Fixed light: two additional drainage slots of 6 mm x 36 mm downwards to outside

Hardware

Type / Manufacturer	T&T fittings Multitrend / Messrs. MACO
Hinges / Bearings	1 corner pivot, 1 scissor action support
Number of locks	3 on lock-side, 1 on hinge-side, 1 at bottom, 1 at top
Max. locking distance	66 cm
Position of locks	neutral

1.2 Representation of test specimen

The constructional details were checked solely for the characteristics to be classified. The drawings are based on unchanged documentation provided by the client.

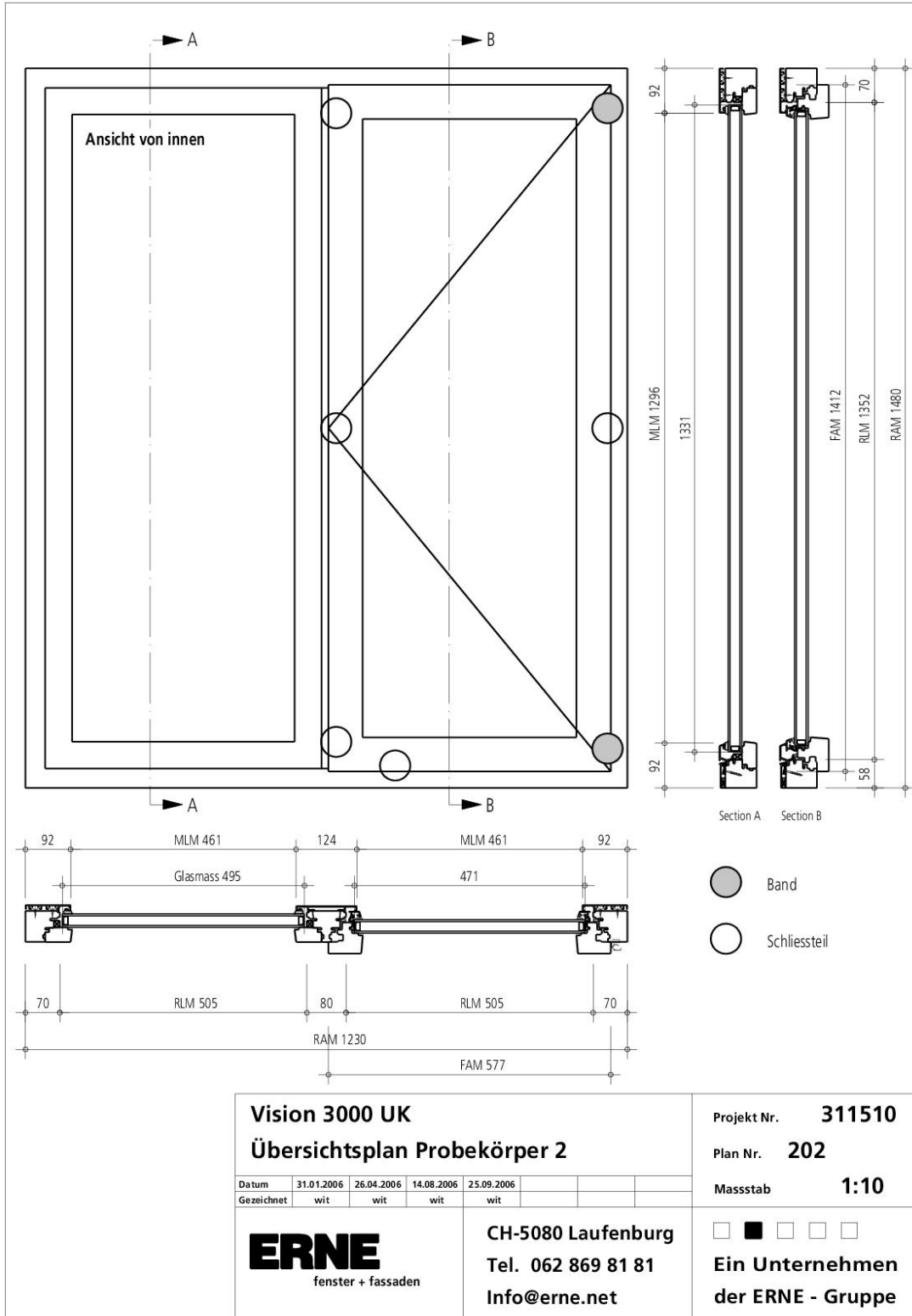


Fig. 1 Drawing of test specimen

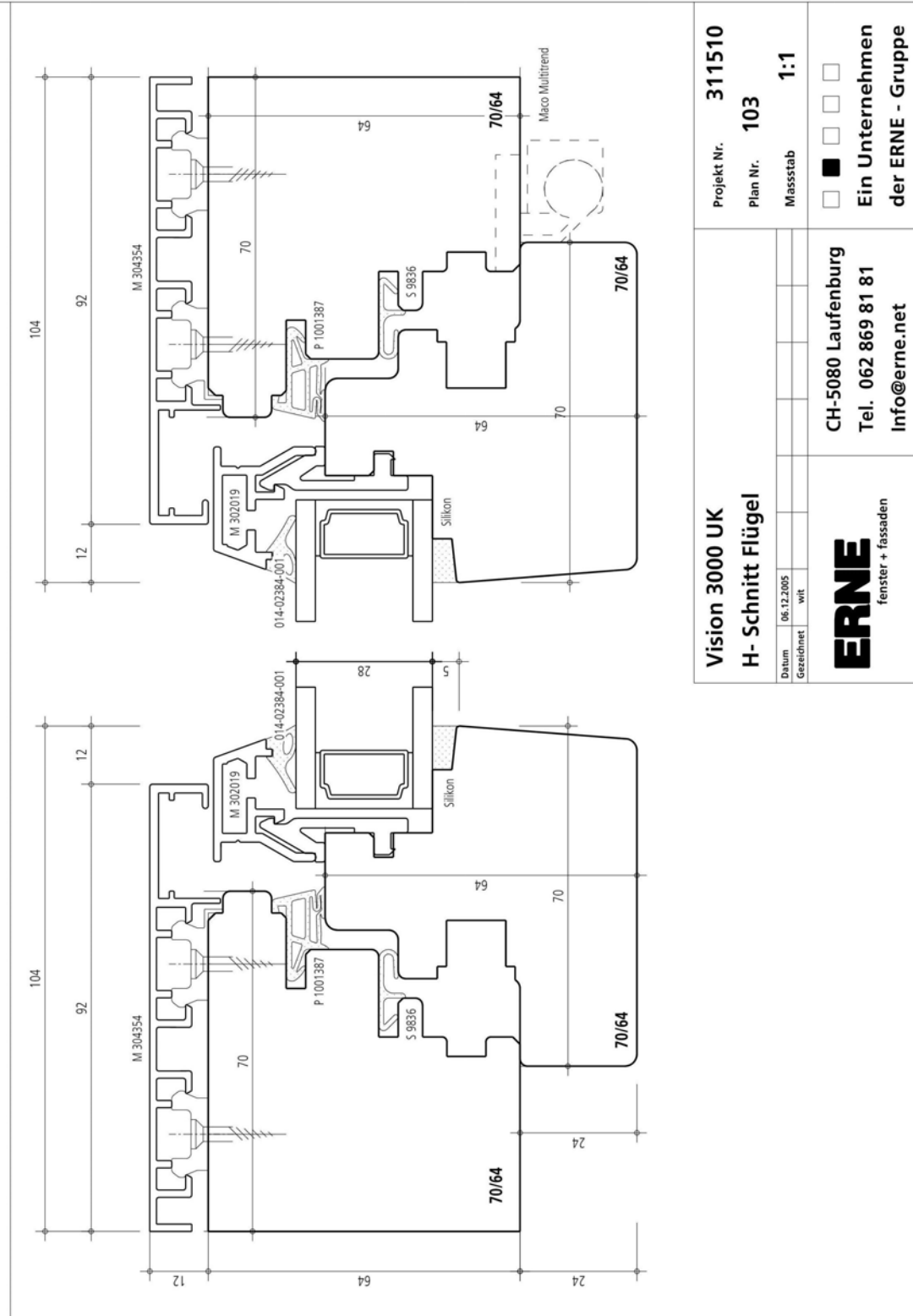


Fig. 3 Horizontal section of window and casement frame members of test specimen

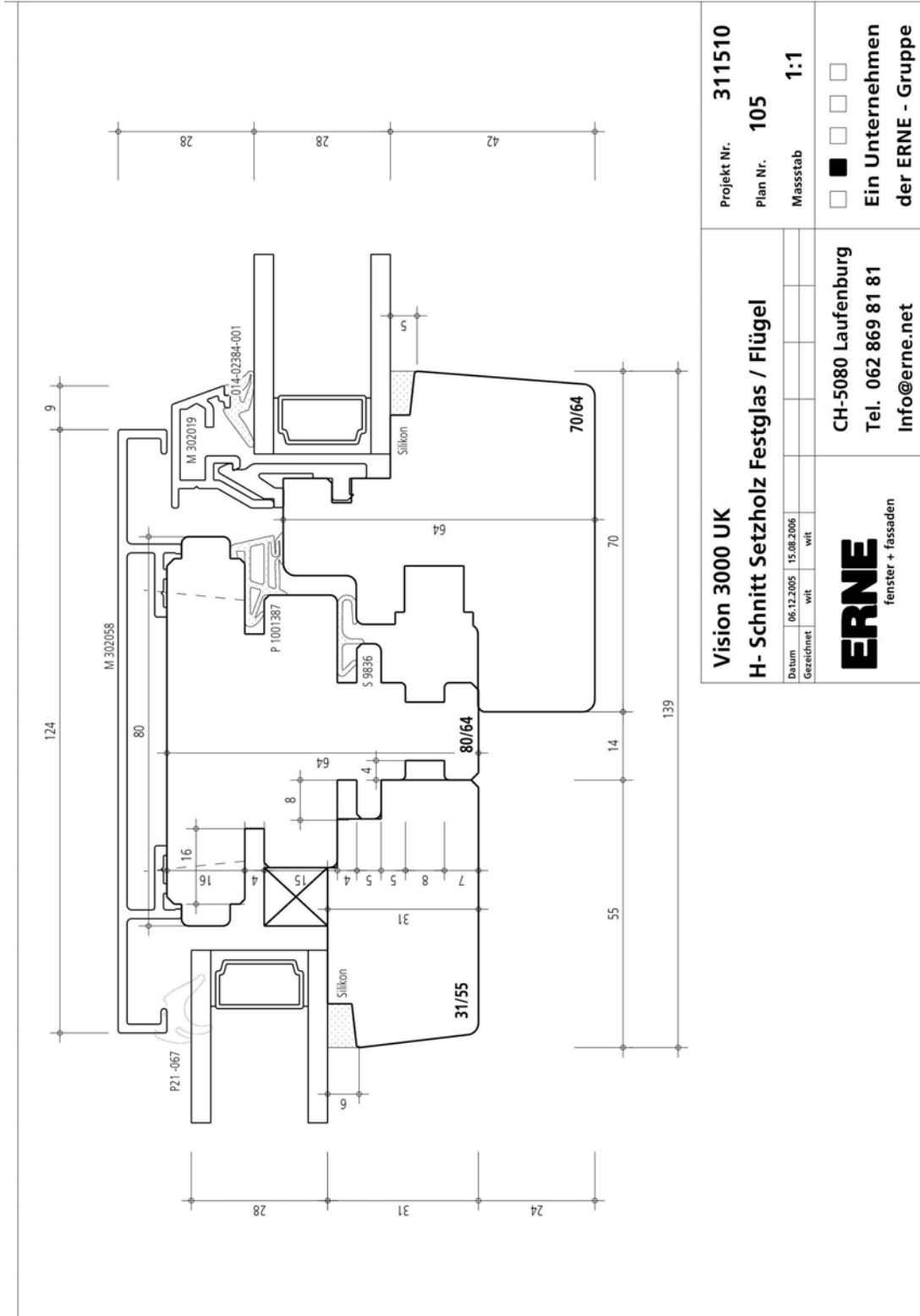


Fig. 4 Horizontal section of casement and mullion profiles of test specimen

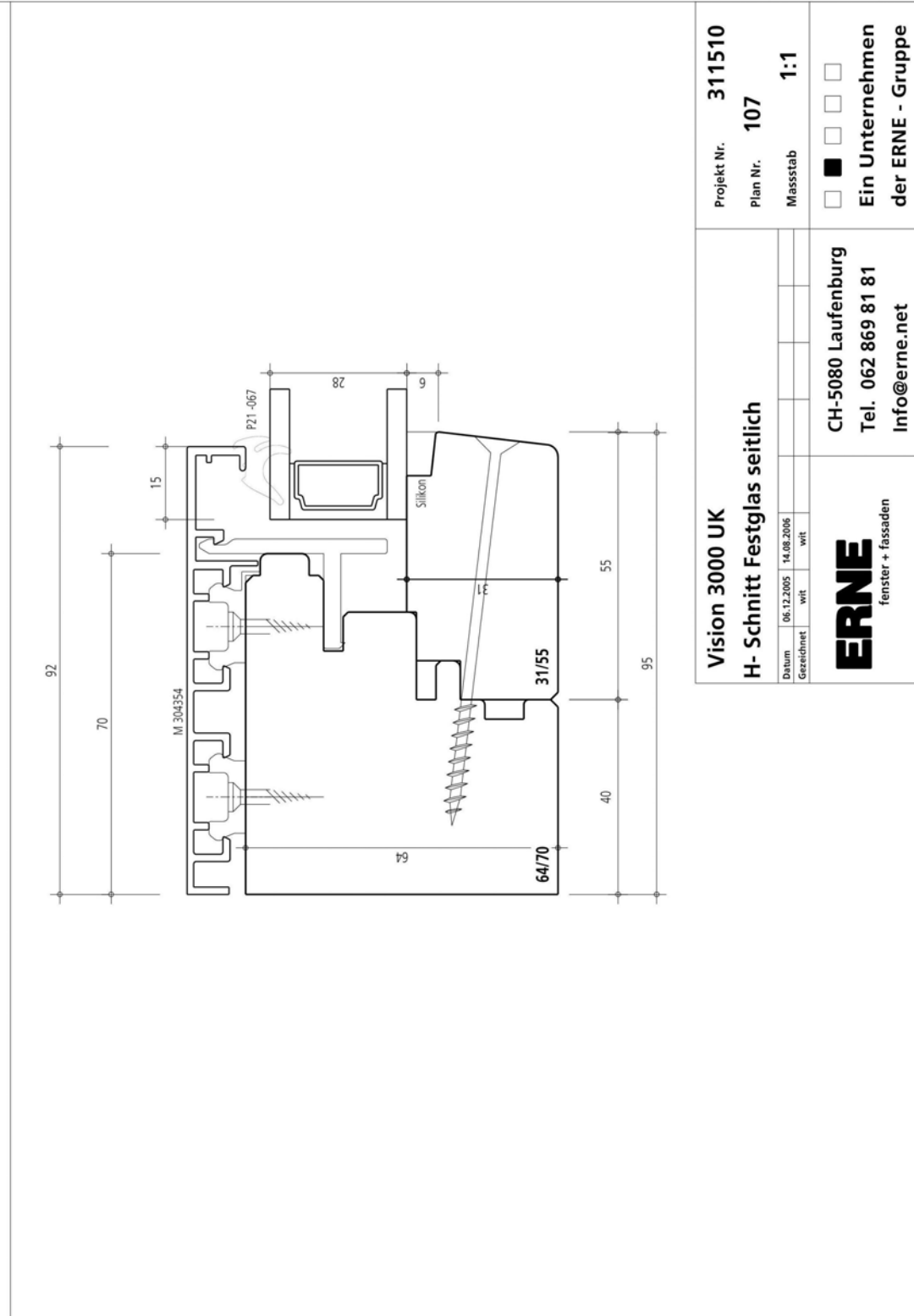


Fig. 5 Horizontal section of window frame of fixed light

2 Procedure

2.1 Sampling

The test specimens were selected by the client.

Number	1
Delivered	16 August 2006 by the client.
Registration No.	20484/002

2.2 Methods

Basis

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 and Doors – Resistance to wind load– Test method.
EN 12046-1 : 2003-11	Opening forces – Test method – Part 1: Windows

Classification standards

EN 12207 : 1999-11	Windows and Doors – Air permeability – Classification
EN 12208 : 1999-11	Windows and Doors – Watertightness – Classification
EN 12210 : 1999-11	Windows and Doors – Resistance to wind load – Classification.
EN 13115 : 2001-07	Windows – Classification of mechanical properties - Racking, torsion and operating forces

Boundary conditions as specified by the standard requirements

Deviations There have been no deviations from the test methods or test conditions

2.3 Test equipment

Window test bench	Device No.: 22999
Torque meter	Device No.: 22852

2.4 Testing

Date/Period	16. August 2006
Testing personnel	Benno Reichelt

2.5 Test sequence

No.	Test	Test standard	Classification standard
1.	Operating forces	EN 12046-1	EN 13115
2.	Air permeability	EN 1026	EN 12207
3.	Resistance to wind load 3.1 Deflection 3.2 Repeat test of positive/negative pressure	EN 12211	EN 12210
4.	Repeat test of air permeability	EN 1026	EN 12207
5.	Watertightness	EN 1027	EN 12208
6.	Resistance to wind load – Safety test	EN 12211	EN 12210

3 Detailed results

Test record

Specimen	Single side-hung window with fixed side light		
Project No.	102 32005		
Client	ERNE AG		
System	Vision 3000 T2		
Frame material	Aluminium-clad wood system		
Date of test	16. August 2006		
Tester	Reichelt		
Specimen No.	20484/002		
Date of receipt	16. August 2006		
Date of manufacture	August 2006		
Attended by:	Mr Witt		
	Size of window frame	1230	x 1480 mm
	Size of casement	577	x 1412 mm
	Area of test specimen	1,8	m ²
	Length of opening joints	4,0	m
	Casement weight	ca. 17	kg
	Temperature	22,2	° C
	Air humidity	47,9	%
	Air pressure	956	hPa

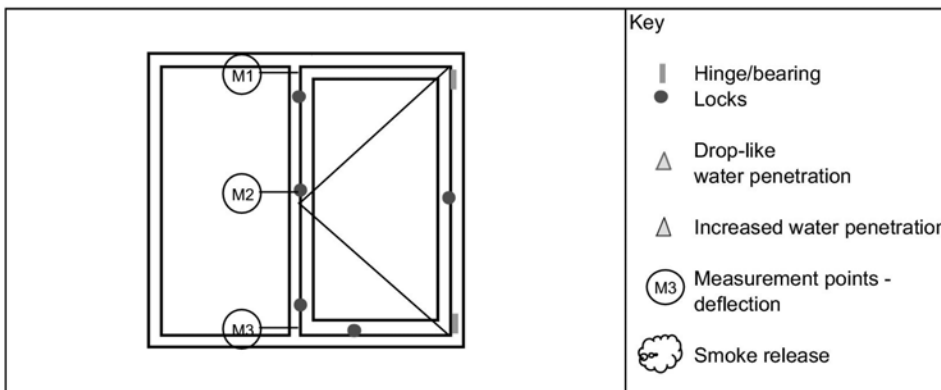


Fig. 1 View of specimen

1 Operating forces - Test according to EN 12046

Table 1 Measurement of operating forces

Individual measured values in Nm	1	2	3	Average value
	3,3	3,5	3,4	3,4

Classification according to EN 13115	Class 2
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2 Air permeability - Test according to EN 1026

Table 2 Measured results 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	0,6	0,8	1,1	1,5	1,7	2,0	2,9	3,5
Joint length-related m ³ /hm	0,15	0,21	0,28	0,37	0,44	0,51	0,72	0,87	
Overall aerea-related m ³ /hm ²	0,32	0,46	0,62	0,80	0,96	1,11	1,58	1,90	

Table 3 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	0,6	1,0	1,6	2,1	2,2	2,5	3,0	3,5
Joint length-related m ³ /hm	0,15	0,24	0,41	0,52	0,56	0,63	0,75	0,87	
Overall aerea-related m ³ /hm ²	0,34	0,53	0,89	1,14	1,22	1,37	1,64	1,91	

Table 4 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	0,6	0,9	1,4	1,8	2,0	2,3	2,9	3,5
Joint length-related m ³ /hm	0,15	0,22	0,35	0,44	0,50	0,57	0,74	0,87	
Overall aerea-related m ³ /hm ²	0,33	0,49	0,76	0,97	1,09	1,24	1,61	1,91	

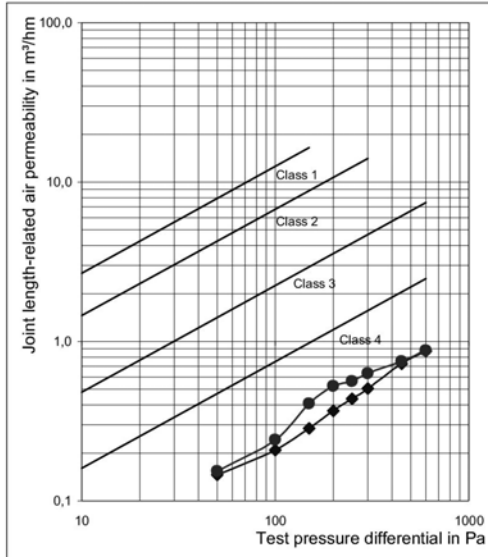


Diagram 1 Joint length-related air permeability (positive and negative wind pressures)

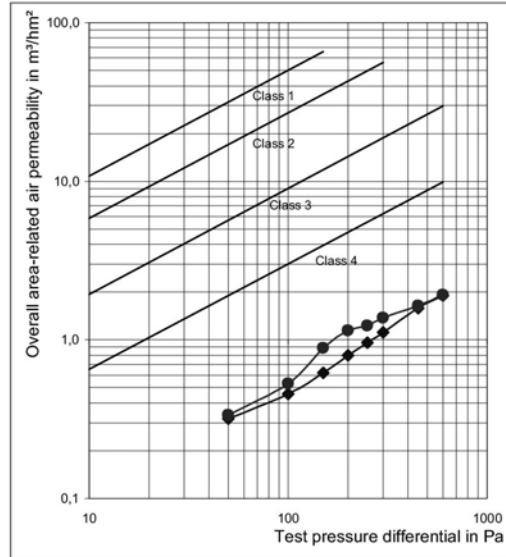


Diagram 2 Overall area-related air permeability (positive and negative wind pressure)

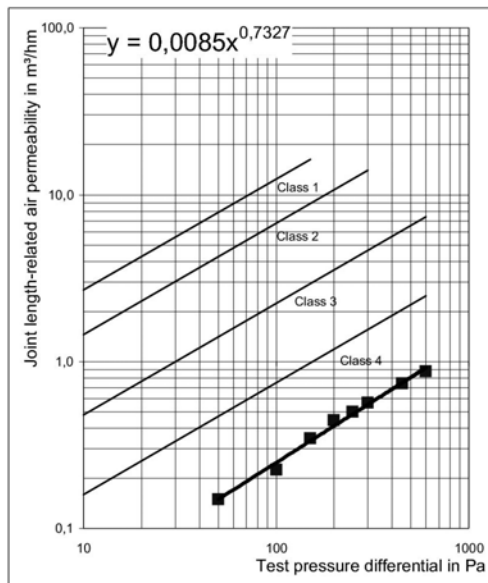


Diagram 3 Joint length-related air permeability (average value from positive and negative wind pressures)

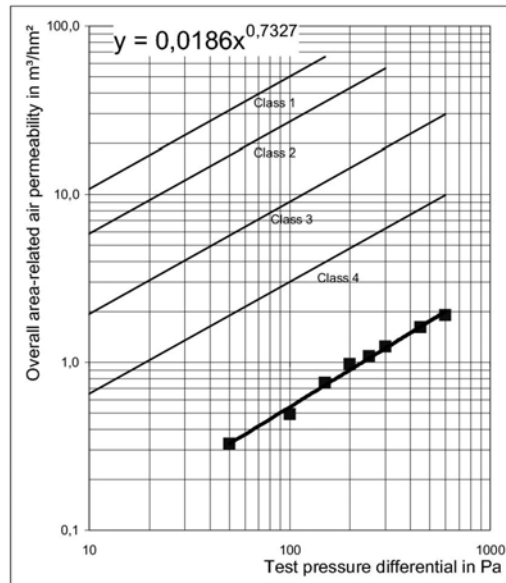


Diagram 4 Overall area-related air permeability (average value from positive and negative wind pressures)

Table 5 Measured results

Reference air permeability related to joint length	Q100 = 0,25 m³/hm
Reference air permeability related to overall area	Q100 = 0,54 m³/hm²
Air permeability related to joint length	Class 4
air permeability related to overall area	Class 4
Total classification according to EN 12207	Class 4

Classification is based on the average values of table 4

3 Resistance to wind load - Test according to EN 12211

3.1 Deflection under wind load

Maximum test pressure \pm : 2000 Pa 3 pressure pulses of 2200 Pa

Table 6 Maximum deflection for classification at effective span $l =$ 1400 mm

Class		Maximum deflection for classification at effective span in mm
A	($l/150$)	9,3
B	($l/200$)	7,0
C	($l/300$)	4,7

Table 7 Measured results of frontal deflection in mm at positive/negative wind pressure

Measured results of frontal deflection in mm	Class	Positive wind pressure					Negative wind pressure				
		1	2	3	4	5	1	2	3	4	5
p_1 in Pa		400	800	1200	1600	2000	-400	-800	-1200	-1600	-2000
M1 in mm		0,2	0,4	0,7	0,9	1,2	-0,4	-0,7	-1,0	-1,3	-1,5
M2 in mm		0,5	1,1	1,8	2,6	3,4	-1,1	-1,9	-2,6	-3,3	-4,0
M3 in mm		0,1	0,3	0,4	0,6	0,8	-0,4	-0,6	-0,8	-1,0	-1,2
f_{rel} in mm		0,4	0,8	1,3	1,8	2,3	-0,7	-1,2	-1,7	-2,2	-2,6
l/f_{rel}		4000	1806	1098	762,9	598,3	-2137	-1138	-824	-651	-532,3

Key

p_1 Test pressure

M1, M2, M3 Frontal dislodgement at measurement points M1, M2, M3

f Frontal deflection

Classification according to EN 12210	Class C5/B5
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*) Classification is based on the lowest evaluation obtained from negative/positive wind pressure

3.2 Dynamic wind loads (negative/positive pressure)

50 cycles at $p_2 \pm$ 1000 Pa

No malfunctions were detected.

Classification according to EN 12210	Class 5
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4 Repeat test 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 shall not be exceeded by more than 20% as set out by EN 12207 (Clause 2 of test report).

The requirements were fulfilled.

5 Watertightness - Test according to EN 1027

No water penetration at up to 600 Pa detected

Classification according to EN 12208	Class 9A
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3.3 Resistance to wind load - Test according to EN 12211 - Safety test

Safety test passed at up to $p_3 \pm$ 3000 Pa passed

Classification according to EN 12210	Class 5
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Total classification according to EN 12210

Deflection at test pressure p_1	\pm 2000 Pa	Class	C5/B5
Test - at repeated pressure p_2	\pm 1000 Pa	Class	5
Safety test - pressure p_3	\pm 3000 Pa	Class	5
Total classification**) Resistance to wind load		Class	C5/B5

*) Classification is based on the lowest evaluation from negative and positive wind pressures.

**) Total classification is based on the lowest evaluation of each individual class.