

Evidence of Performance

Resistance to wind load
Watertightness
Air permeability



Test Report 101 29497/1e

This is a translation of Test Report 101 29497/1 dated 1 August 2005.

Client **SCHÜCO International KG**
Karolinenstraße 1-15

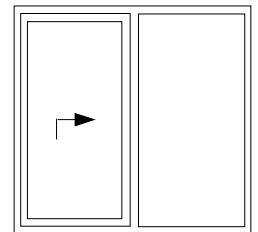
D-33609 Bielefeld
Germany

Basis

EN 14351-1 : 2004-04, Windows and external pedestrian doors – Product standard
Test standards:
EN 1026 : 2000-06
EN 1027 : 2000-06
EN 12211 : 2000-06
EN 12046-1 : 2003-01

Product	Single lifting sliding door (2 slide tracks), Type 2A/1
Designation	Royal S 160.HI
Overall dimensions (W x H)	2640 mm x 2798 mm
Frame material	Aluminium thermal break profiles
Special features	-/-

Representation



Resistance to wind load – EN 12210



Class C2/B3

Watertightness – EN 12208



Class 7A

Air permeability – EN 12207



Class 4

Operating forces – EN 13115



Class 1

Instructions for use

The present test report serves to demonstrate the above characteristics for windows as per prEN 14351-1 : 2004-04.

Validity

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

The test results can be extrapolated for the same or smaller dimensions of the same design, type of rebate and similar format under observance of the relevant casement weight.

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.

Notes on publication

The ift-Guidance Sheet "Guidance and Conditions for the Use of ift Test Documents" applies.

The cover sheet can be used as abstract.

Contents

The test report comprises a total of 10 pages.

- 1 Object
- 2 Procedure
- 3 Detailed results

ift Rosenheim
29 January 2008

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DAP-PL-0808 99
DAP-ZE-2288 00
TGA-ZM-16-93-00
TGA-ZM-16-93-60

1 Object

1.1 Description of test specimen

Building component	Single lifting sliding door, (2 slide tracks)
Manufacturer	SCHÜCO International KG
Profile system	Royal S160.HI, Type 2A/1
Mode of operation	Lifting sliding
Direction of operation	To the right (seen from inside)
Exterior frame dimensions (W x H)	2640 mm x 2798 mm
Exterior casement dimensions (W x H)	1500 mm x 2700 mm
Frame members	
Manufacturer	SCHÜCO International KG
Material	Aluminium thermal break profiles
Profile system	Royal S 160.HI
Profile number	148450
Frame joint	Corner connectors, mitre-sealed and nailed
Casement members	
Active casement	
Manufacturer	SCHÜCO International KG
Material	Aluminium thermal break profiles
Profile system	Royal S 160.HI
Profile number	148570
Frame joint	Corner connectors, mitre-sealed and nailed
Reinforcing profile	In vertical profile of active casement in central area - internal structural profile 202792, see horizontal section point 4
Inactive casement	
Casement members	
SCHÜCO International KG	
Manufacturer	Aluminium thermal break profiles
Material	Royal S 160.HI
Profile system	148570
Profile number	Corner connectors, mitre-sealed and nailed
Frame joint	In vertical profile of inactive casement in central area - internal structural profile 202792, additional structural add-on profile 201056 fixing profile 224129 and structural cover plate 105620
Reinforcing profile	On vertical casement profile in central area, see horizontal section point 4
Rebate design	
Rebate drainage	
Inactive casement	
In frame member - bottom exterior hollow chamber centrally sealed using divider 236159, rebate drainage through 1 slot 15 mm x 8 mm to outside and 3 holes Ø 12 mm inside through capillary drain tubes 242002, in plastic insert profile 244813 2 hole Ø 15 mm in visible area, see processing instructions, drawing K15173 DD	

Rebate drainage	Active casement In frame member – bottom 3 slots 8 mm x 34 mm to outside and 3 slots 8 mm x 34 mm in rebate , plastic insert profile 244813, 3 hole Ø 15 mm covered by threshold profile 333520, see processing instructions, drawing K15173
Rebate seal Exterior and interior	Top horizontal gasket 244830, side and bottom 244829 including sealing bridges at top 244831
Centre Profile number	Interlocking profile with EPDM gasket 244669 244819 / top EPDM – seal 244884 Bottom EPDM – seal 244884
Type / Material	Material - polyamide with EPDM support
Infill panel Total thickness	Insulating glass units 26 mm
Configuration	<u>5/16/5</u>
Incorporation of infill panels Sealing system	using pre-manufactured gaskets
Exterior Profile number	224063
Manufacturer	SCHÜCO International KG
Material	EPDM black
Corner configuration	Continuous, corners additionally filled with resilient sealant
Interior Profile number	224378
Manufacturer	SCHÜCO International KG
Material	EPDM black
Corner configuration	Butt-jointed
Vapour pressure equalization	Bottom 3 slots 8 mm to glazing rebate depth, to outside 3 holes Ø 8 mm, top sides 1 hole Ø 8 mm each, see processing instructions, drawing K15173
Hardware Type / Manufacturer	GU lifting sliding fittings / customized system fittings
Maximum casement weight	250 kg
Number of locks	3 pieces
Maximum locking distance	1450 mm
Operating forces	< 10 Nm / 100 N

1.2 Representation of test specimen

The drawings are based on unchanged documentation provided by the client and have not been checked fully and in detail for technical correctness.

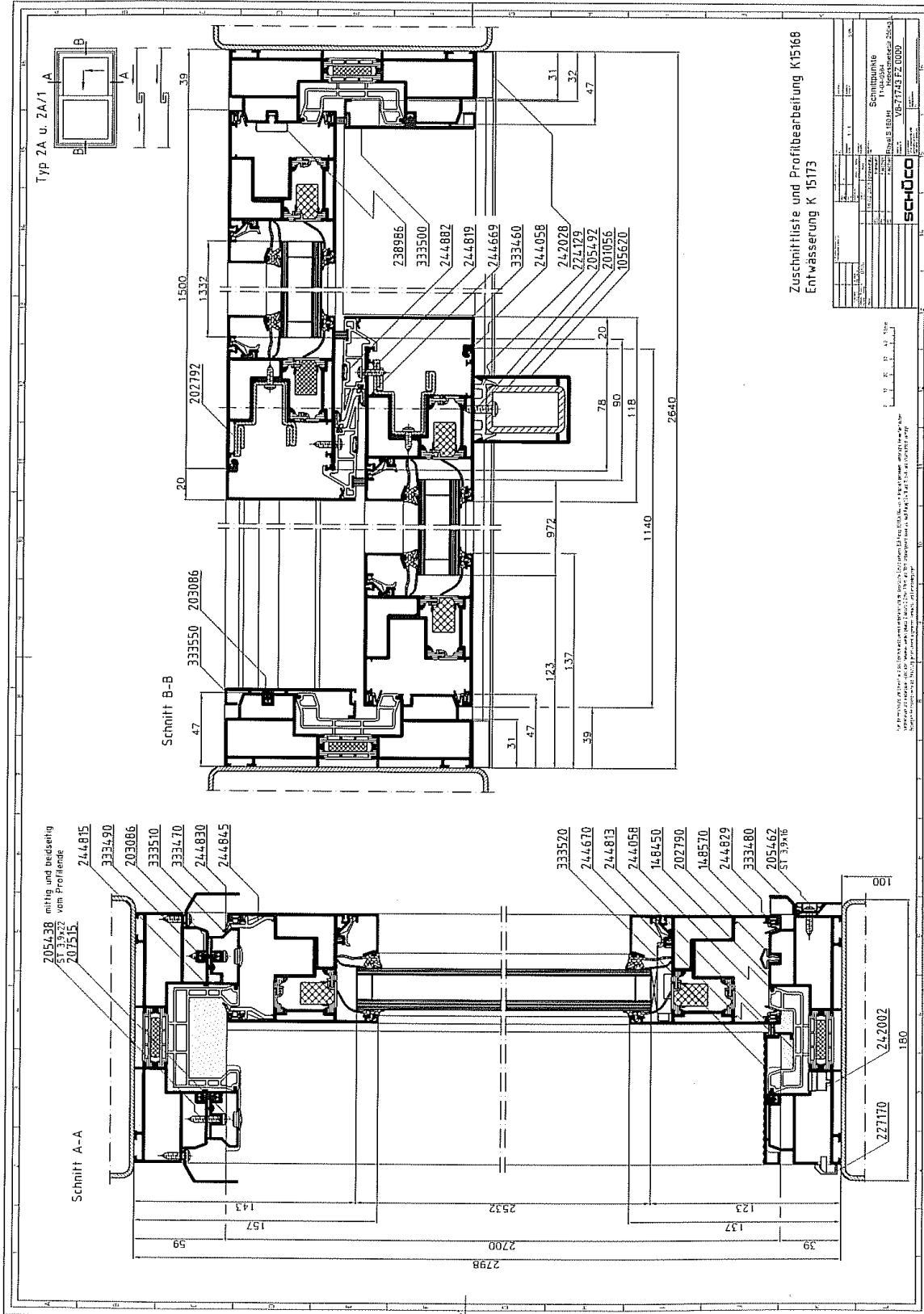


Fig 1 Representation of test specimen

Page 5 of 10
 Test report: 101 29497/1e dated 29 January 2008
 Client: SCHÜCO International KG, D-33525 Bielefeld, Germany

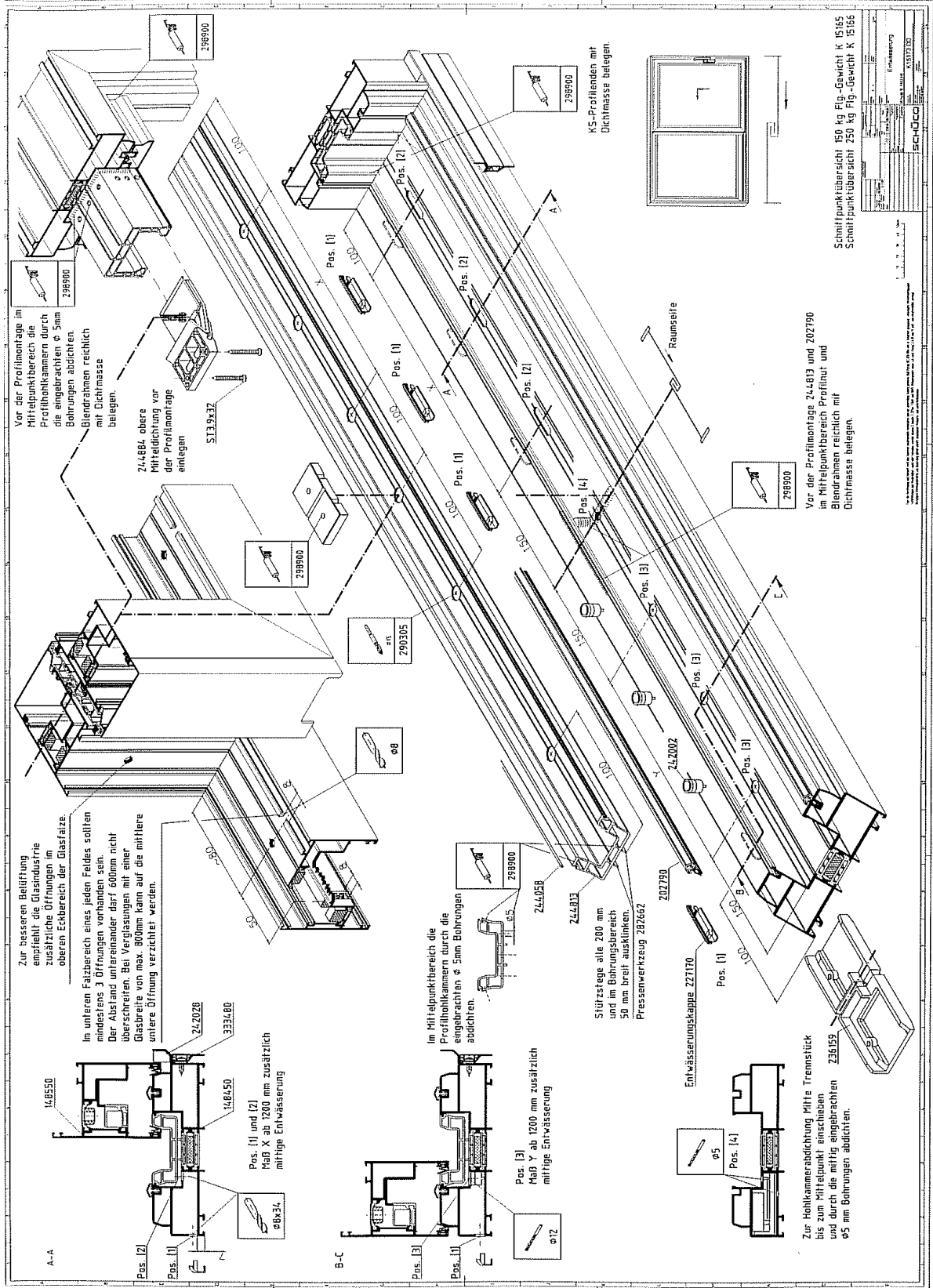


Fig 2 Drainage

2 Procedure

2.1 Sampling

Selection of the test specimens by the ift Rosenheim was based on the system description

Quantity	1
Delivered	23 February 2004 by the client
Registration number	17872/001

2.2 Methods

Basis of test sequence

EN 1026 : 2000-06	Windows and doors – Air permeability – Test method
EN 1027 : 2000-06	Windows and doors – Water tightness – Test method
EN 12211 : 2000-06	Windows and doors – Resistance to wind load – Test method
EN 12046-1 : 2003-01	Windows – Operating Forces – Test method

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 12400 : 2003-01	Windows and doors – Mechanical durability – Requirements and classification

Boundary conditions As specified by the standards

Deviations There were no deviations from the test method and/or test conditions

2.3 Test equipment

Window test rig	Device number: 22200
Displacement transducers	Device numbers: 22262 to 22264

2.4 Testing

Date/Period	23 February 2005
Testing personnel	Dirk Köberle, Thomas Hannover, Martin Weinzierl



2.5 Test sequence

Test	Type of test	Test standard	Classification
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 Repeated exposure to positive/negative wind pressures	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

Test specimen: Single lifting sliding door, Type 2A/1
 Specimen No.: 17872/001

1 Operating forces - Test according to prEN 12046-1

Individual measure	1	2	3	Average
in Nm	8,0	8,5	8,0	8,2

Classification according to EN 13115	Class 1
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2 Air permeability - Test according to EN 1026

Joint length: 8,40 m Test specimen overall area 7,39 m²

Table 1 Measured values at positive wind pressure	Pressure differential in		50	100	150	200	250	300	450	600
	Flow rate (volume)									
	absolute	m ³ /h	3,9	5,8	7,3	8,6	9,5	10,8	14,5	18,0
	joint length-related	dm ³ /hm	0,46	0,69	0,87	1,02	1,13	1,29	1,73	2,14
	overall area-related	m ³ /hm ²	0,53	0,79	0,99	1,16	1,29	1,46	1,96	2,44

Table 2 Measured values at negative wind pressure	Pressure differential in		50	100	150	200	250	300	450	600
	Flow rate (volume)									
	absolute	m ³ /h	4,1	6,2	7,6	9,0	10,3	11,7	20,2	30,0
	joint length-related	dm ³ /hm	0,49	0,74	0,90	1,07	1,23	1,39	2,40	3,57
	overall area-related	dm ³ /hm ²	0,56	0,84	1,03	1,22	1,39	1,58	2,73	4,06

Table 3 Average value from positive and negative wind pressures	Pressure differential in		50	100	150	200	250	300	450	600
	Flow rate (volume)									
	absolute	m ³ /h	4,0	6,0	7,5	8,8	9,9	11,3	17,4	24,0
	joint length-related	dm ³ /hm	0,48	0,71	0,89	1,05	1,18	1,34	2,07	2,86
	overall area-related	dm ³ /hm ²	0,54	0,81	1,01	1,19	1,34	1,52	2,35	3,25

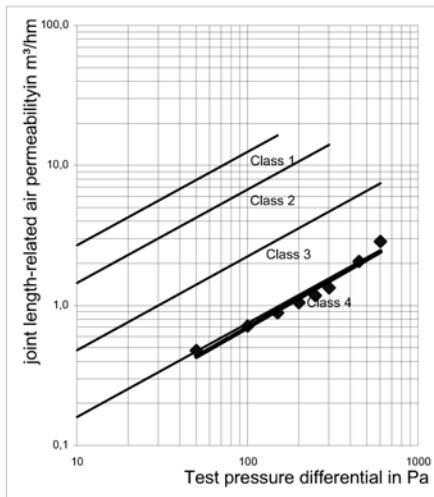


Diagram 1 Joint length-related air permeability

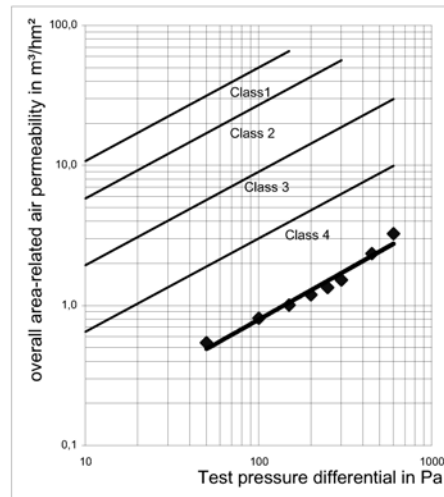


Diagram 2 Overall area-related air permeability

Table 4 Measured results

Reference air permeability related to joint length	Q100 = 1,54 m ³ /hm
Reference air permeability related to overall area	Q100 = 1,77 m ³ /hm ²
Air permeability related to joint length	Class 3
Air permeability related to overall area	Class 4
Total classification according to EN 12207	Class 4

Classification is based on the average values given in Table 3

3 Resistance to wind load - Test according to EN 12211

3.1 Deflection under wind load

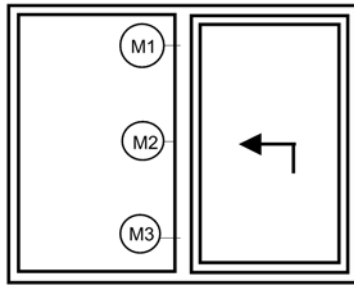


Fig. 1 Representation of specimen showing layout of measurement points M1, M2 and M3 (seen from inside)

Key: ● locks
 | hinges

Measurement of deflection of: mullion profile

Table 5 Maximum deflection for classification of effective span 2685 mm

Class		maximum permitted deflection in mm
A	(l/150)	17,9
B	(l/200)	13,4
C	(l/300)	9,0

Table 6 Measured results of frontal deflection in mm at positive wind pressure

Table 6 Measured results of frontal deflection in mm	p ₁ in Pa	positive wind pressure					negative wind pressure				
		400	800	1200	1600	2000	400	800	1200	1600	2000
M1 in mm		1,3	2,1	2,9	—	—	1,8	2,9	3,9	—	—
M2 in mm		4,5	8,2	12,1	—	—	3,8	7,1	10,3	—	—
M3 in mm		1,2	1,9	2,7	—	—	0,6	1,5	2,2	—	—
f in mm		3,3	6,2	9,3	—	—	2,6	4,9	7,3	—	—
l/		826,2	433,1	288,7	—	—	1033	548	370,3	—	—

Key
 p₁ Test pressure
 M1, M2, M3 frontal dislodgement at measurement points M1, M2, M3
 f frontal deflection

Classification according to EN 12210 ^{*)}	Class C2/B3
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*) Classification is based on the lowest evaluation obtained from positive and negative wind pressures

3.2 Repeated application of positive / negative wind pressures

50 cycles at p₂ ± 600 Pa
 No malfunctions were detected.

Classification according to EN 12210	Class 3
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Page 10 of 10
 Test report.: 101 29497/1e dated 29 January 2008
 Client: SCHÜCO International KG, D-33525 Bielefeld, Germany



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

Following testing resistance to wind load by applying test pressures p_1 and p_2 the maximum values of the air permeability class determined according to EN 12207 (see Clause 2 of the test record) must not be exceeded by more than 20%.

The requirements were fulfilled.

5 Watertightness - Test according to EN 1027

No water penetration at up to 300 Pa

Classification according to EN 12208	Class 7A
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6 Resistance to wind load - Test according to EN 12211 - Safety test

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

Classification according to EN 12210	Class 3
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Total classification according to EN 12210

Deflection at test pressure p_1 *)	\pm 1200 Pa	Class	C2/B3
Test at repeated application of pressure $p_{2,at}$	\pm 600 Pa	Class	3
Safety test at p_3	\pm 1800 Pa	Class	3
Total classification**) Resistance to wind load		Class	C2/B3

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

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

ift Rosenheim
 28. April 2004