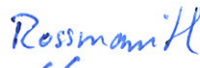



Test Certificate

Bern University of Applied Sciences
Architecture, Wood and Civil Engineering
Burgdorf, Biel



Test object	Hardware system for glass sliding walls
Product code	HAWA-Aperto 60/GL
Certificate No.	7995-PZ-045
Test Report No.	7075-PB-02, 7995-GS-01
Order No.	7995.DPE
Customer	Hawa AG Untere Fischbachstrasse 4 CH – 8932 Mettmenstetten
Construction	Sliding glass panel with two trolleys at the top in a top track and two guides at the bottom in a guide channel; Glazing (toughened safety glass) at the top and at the bottom in a glass retainer profile; Width: 1194 mm; Height: 2532 mm; Weight: ca 60 kg
Relevant standards	EN 1932 (03/2001) External blinds and shutters – Resistance to wind loads – Method of testing EN 12046-1 (11/2003) Operating forces – Test method – Part 1: Windows
Classification	Class 5 (Resistance to wind loads) Class 2 (Operating forces) EN 13659 (06/2004) + A1 (10/2008) Shutters – Performance requirements including safety (Chapter 4 and 6)
Date or issue	30.11.2004, prolonged 05.05.2010
Validity	This certificate will expire once the construction or the material of the test product or one of its components changes or if the content or validity of the underlying standard changes.
Address of test laboratory	Bern University of Applied Sciences R&D Department, Facades, Finishing and Furniture Solothurnstrasse 102, CH-2504 Biel
Person in charge	Christoph Rossmannith 
Head R&D Facades, Finishing and Furniture	Urs Uehlinger 



SCHWEIZERISCHER PRÜFSTELLENDIENST
SERVICE SUISSE D'ESSAI
SERVIZIO DI PROVA IN SVIZZERA
SWISS TESTING SERVICE

Nach ISO/IEC 17025 akkreditiert, STS 317
Notified Body No: 2172

BUAS I Research and Development

SUMMARY OF RESULTS

Test object

Hardware system for glass sliding walls
System HAWA-Aperto 60/GL

Item number

Glass retainer profiles: No. 19027, 19026

Trolley: No. 18708

Top tracks: No. 17795, 17796,
16891, 17529

Bottom guide channels: No. 18200,
18864, 18216,
18477

Floor guide: No. 18649

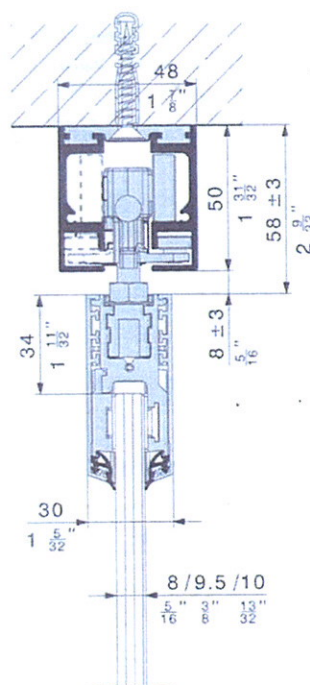
Measures and weights

Weight of sliding element: 60.1 kg

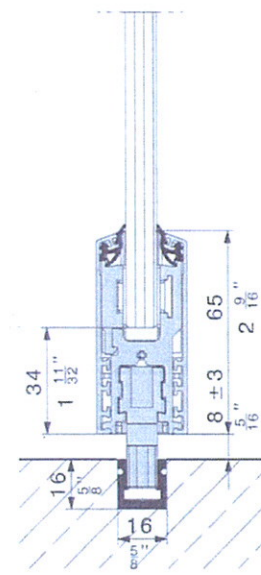
Width of sliding element: 1194 mm

Height of sliding element
(incl. profile): 2532 mm

Thickness of
toughened safety glass: 8 mm



Guidance at the top



Guidance at the bottom

Permissible measures and weights according to the producer

Maximum weight per sliding element: 60 kg

Width per sliding element: 500 mm – 1200 mm

Maximum height per sliding element (incl. profile): 2600 mm

thickness of sliding panel (toughened safety glass): 8 mm / 10 mm

Overview and results of the conducted tests

	operating forces F_c		functional testing	damage or destruction	classification EN 13659	
	to the left	to the right			wind load	operating force
receiving control	3.9 N	3.3 N	alright	no	--	2
after testing pressure $F_N = + 150$ Pa	4.0 N	3.3 N	alright	no ¹⁾	3	2
after testing pressure $F_N = + 300$ Pa	4.1 N	3.6 N	alright	no ¹⁾	5	2
after testing pressure $F_N = + 480$ Pa	4.1 N	3.6 N	alright	no ¹⁾	5	2
safety test $F_S = + 480$ Pa	--	--	alright	no ¹⁾	5	--

¹⁾ For all pressure levels the deflection of the glass was limited to a maximum of 26 mm in order to avoid any destruction. Please note that in use the permissible deflection in accordance with the glass producer must not be exceeded.

The procedures and testing facilities prescribed in the standards comply with the accredited procedures and testing facilities applied at the BUAS.

The testing was conducted on 18.10.2004 on the window-testing facility at BUAS in Biel.