

Evidence of Performance

Airborne sound insulation of building components



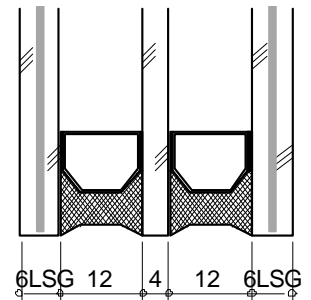
Test Report
No. 14-000251-PR01
(PB Z09-H01-04-en-02)

Client **PRESS GLASS SA Nowa Wies**
Kopalniana 9
42-262 Poczesna
Poland

Basis
EN ISO 10140-1 : 2010
+A1:2012
EN ISO 10140-2 : 2010
EN ISO 717-1 : 2013
14-000251-PR01 (PB Z09-H01-04-en-01) dated 23rd of May 2014

Product	Insulating glass unit
Designation	Type 33.1 TH1,1 kl.2(B)2+12+FL 4+12+33.1 TH1,1 kl.2(B)2 Ar
External Dimensions (W x H)	1,230 mm x 1,480 mm
Construction	6LSG / 12 / 4 / 12 / 6LSG
Gas filling	Argon
Area related mass	40.4 kg/m ²
Special features	-/-

Representation



Instructions for use

This test report serves to demonstrate the airborne sound insulation of a building component.

Applicable for Germany.

R_w corresponds to $R_{w,F}$ for DIN 4109, Annex 1, Table 40

Validity

The data and results given relate solely to the tested and described specimen.

Testing the sound insulation does not allow any statement to be made on further characteristics of the present construction regarding performance and quality.

Notes on publication

The ift-Guidance Sheet "Conditions and Guidance for the Use of ift Test Documents" applies. The cover sheet can be used as abstract.

Weighted sound reduction index R_w
Spectrum adaptation terms C and C_{tr}



$$R_w (C; C_{tr}) = 37 (-3; -8) \text{ dB}$$

ift Rosenheim
05.06.2014

Dr. Joachim Hessinger, Dipl.-Phys.
Head of Testing Department
Building Physics

Andreas Preuss, Dipl.-Ing. (FH)
Head of Laboratory
Building Acoustics

Contents

The test report contains a total of 7 pages:

- 1 Object
 - 2 Procedure
 - 3 Detailed results
 - 4 Instructions for use
- Data sheet (1 page)

Airborne sound insulation of building components

Test Report 14-000251-PR01 (PB Z09-H01-04-en-02) dated 05.06.2014

Client **PRESS GLASS SA Nowa Wies**, 42-262 Poczesna (Poland)**1 Object****1.1 Description of test specimen (All dimensions in mm)**

Component	Insulating glass unit
Product designation	Type 33.1 TH1,1 kl.2(B)2+12+FL 4+12+33.1 TH1,1 kl.2(B)2 Ar
External dimensions (W x H)	1,230 mm x 1,480 mm
Visible size (W x H)	1,200 mm x 1,450 mm
Total thickness	
On the edge	40.9 mm
In the middle of pane	41.4 mm
Area related mass kg/m ²	40.4 kg/m ²
Construction	6LSG / 12 / 4 / 12 / 6LSG
Construction of laminated glass / layer dimension	33.1 / 0.38mm , 33.1 / 0.38mm
Type / Manufacturer of the laminated glass	PVB / Guardian
Pane temperature in °C	21°C
Spacers	
Material	Aluminium - Vetricm
Manufacturer	Alu-Pro
Edge seals	Two planes, total width 9-10 mm
External type	PS (Thiover)
Manufacturer	Fenzi
Internal type	PIB (Butylver)
Manufacturer	Fenzi
Edge cover	Edge cover 5-6 mm
Gas filling in cavity	According to analysis at ift
Type of gas	Argon
Volume in %	98% / 99%

The description is based on inspection of the test specimen at **ift** Laboratory for Building Acoustics. Item designations / numbers as well as material specifications were provided by the client.

1.2 Mounting in test rig

Test rig Window test rig „Z“ with suppressed flanking transmission acc. to EN ISO 10140-5: 2010; the test rig includes a mounting frame with a continuous acoustic break which is sealed in the test opening with closed-cell permanently resilient sealant.

Mounting of test specimen Test specimen mounted by **ift** Laboratory for Building Acoustics.

Airborne sound insulation of building components

Test Report 14-000251-PR01 (PB Z09-H01-04-en-02) dated 05.06.2014

Client **PRESS GLASS SA Nowa Wies**, 42-262 Poczesna (Poland)

Mounting conditions	The unit was fitted at a distance of 5 mm into a wooden frame of 25 mm x 25 mm cross section. The cavity between test rig and glazing beads was completely filled with plastic sealant type Perennator 2001 S grey.
Mounting position	according to EN ISO 10140-1:2010+A1:2012 Annex D
Preparation	Storage of the glazing one day before testing in the test rig for conditioning.

2 Procedure**2.1 Sampling**

Sampling	The test specimen were selected by the client
Quantity	1
Manufacturer	PRESS GLASS SA
Manufacturing plant , Site of manufacturing	PRESS GLASS SA Division in Radomsko
Date of manufacture / date of sampling	9th of April 2014
Production line	1
Responsible for sampling	Mr. Machura, Pawel
Delivery at ift	10th of April 2014 by the client via forwarding agency
ift Registration Number	36884/09

2.2 Process**Basis**

EN ISO 10140-1:2010 + A1 : 2012	Acoustics; Laboratory measurement of sound insulation of building elements - Part 1: Application rules for specific products (ISO 10140-1:2010+Amd.1:2012)
EN ISO 10140-2:2010	Acoustics; Laboratory measurement of sound insulation of building elements - Part 2: Measurement of airborne sound insulation (ISO 10140-2:2010)
EN ISO 717-1: 2013	Acoustics; Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation

Corresponds to the national German standard:

DIN EN ISO 10140-1:2012-05, DIN EN ISO 10140-2:2010-12 and DIN EN ISO 717-1 : 2013-06

Airborne sound insulation of building components

Test Report 14-000251-PR01 (PB Z09-H01-04-en-02) dated 05.06.2014

Client **PRESS GLASS SA Nowa Wies**, 42-262 Poczesna (Poland)

Procedure and scope of measurement are in conformity with the principles of the Working Group of sound insulation testing bodies approved by the national building supervisory authorities in cooperation with the standardization committee NA 005-55-75-AA (subcommittee UA 1 - DIN 4109).

Boundary conditions	As required in the standard.
Deviation	There are no deviations from the test procedure and/or test conditions.
Test noise	Pink noise
Measuring filter	One-third-octave band filter
Measurement limits	
Low frequencies	The dimensions of the receiving room were smaller than recommended for testing in the frequency range from 50 Hz to 80 Hz as per EN ISO 10140-4:2010 Annex A (informative). A moving loudspeaker was used.
Background noise level	The background noise level in the receiving room was determined during measurement and the receiving room level L_2 corrected by calculation as per EN ISO 10140-4: 2010 Clause 4.3.
Maximum sound insulation	The maximum sound insulation of the test set-up was at least 15 dB higher than the measured sound reduction index of the test specimen. Not corrected by calculation.
Measurement of reverberation time	arithmetical mean: two measurements each of 2 loudspeaker and 3 microphone positions (a total of 12 independent measurements).
Measurement equation A	$A = 0,16 \cdot \frac{V}{T} \text{ m}^2$
Measurement of sound level difference	Minimum of 2 loudspeaker positions and rotating microphones.
Measurement equation R	$R = L_1 - L_2 + 10 \cdot \lg \frac{S}{A} \text{ in dB}$

KEY

A	Equivalent absorption area in m^2
L_1	Sound pressure level source room in dB
L_2	Sound pressure level receiving room in dB
R	Sound reduction index in dB
T	Reverberation time in s
V	Volume of receiving room in m^3
S	Testing area of the specimen in m^2

Airborne sound insulation of building components

Test Report 14-000251-PR01 (PB Z09-H01-04-en-02) dated 05.06.2014

Client **PRESS GLASS SA Nowa Wies**, 42-262 Poczesna (Poland)**2.3 Test equipment**

Device	Type	Manufacturer
Integrating sound meter	Type Nortronic 840	Norsonic-Tippkemper
Microphone preamplifiers	Type 1201	Norsonic-Tippkemper
Microphone unit	Type 1220	Norsonic-Tippkemper
Calibrator	Type 1251	Norsonic-Tippkemper
Dodecahedron loudspeakers	Own Design	-
Amplifier	Type E120	FG Elektronik
Rotating microphone boom	Own Design / Type 231-N-360	Norsonic-Tippkemper

The **ift** Laboratory for Building Acoustics participates in comparative measurements at the Physikalisch-Technische Bundesanstalt (PTB) in Braunschweig every three years, the last one was in April 2013. The sound level meter used, Series No. 17848, was calibrated by the Dortmund Eichamt (calibration agency) on 19 January 2012. The calibration is valid until 31 December 2014. The sound level meter used was DKD calibrated by the company Norsonic Tippkemper (DKD - Deutscher Kalibrierdienst "German Calibration_Service") on 25 March 2013.

2.4 Testing

Date 23rd of April 2014

Operating Testing Officer Andreas Preuss

3 Detailed results

The values of the measured sound reduction index of the tested Insulating glass unit are plotted as a function of frequency in the annexed data sheet and tabled.

As per EN ISO 717-1 the weighted sound reduction index R_w and the spectrum adaptation terms C and C_{tr} for the frequency range 100 Hz to 3150 Hz obtained by calculation are as follows:

$$R_w (C;C_{tr}) = 37 (-3;-8) \text{ dB}$$

According to EN ISO 717-1 the following additional spectrum adaptation terms are obtained

$C_{50-3,150} = -3 \text{ dB}$	$C_{100-5,000} = -2 \text{ dB}$	$C_{50-5,000} = -2 \text{ dB}$
$C_{tr,50-3,150} = -8 \text{ dB}$	$C_{tr,100-5,000} = -8 \text{ dB}$	$C_{tr,50-5,000} = -8 \text{ dB}$

Airborne sound insulation of building components

Test Report 14-000251-PR01 (PB Z09-H01-04-en-02) dated 05.06.2014

Client **PRESS GLASS SA Nowa Wies**, 42-262 Poczesna (Poland)

4 Instructions for use

4.1 Test value

Basis

DIN 4109:1989-11 Sound insulation in buildings, requirements and verifications

DIN 4109 Bb1/A1:2003-09 Sound insulation in buildings, examples and calculation methods correction A1

For verification of sound insulation according to DIN 4109, Annex 1 : A1:2003-09, Table 40 the weighted sound reduction index R_w corresponds to the test value $R_{w,P, GLASS}$

$$R_{w,P, GLASS} = 37 \text{ dB}$$

4.2 Laminated glass

The sound reduction of laminated glass depends on the temperature of the environment. If the temperature is lower than the test temperature the sound reduction index may be reduced.

4.3 Test standards

The standard series EN ISO 10140:2010 supersedes those parts of the standard series EN ISO 140 that were applicable until the respective date and describe laboratory tests. According to the two standard series, the test methods are identical.

ift Rosenheim

Laboratory for Building Acoustics

05.06.2014

Sound reduction index according to ISO 10140 - 2

Laboratory measurements of airborne sound insulation of building elements



Client: **PRESS GLASS SA Nowa Wies**, 42-262 Poczesna (Poland)

Product designation Type 33.1 TH1,1 kl.2(B)2+12+FL 4+12+33.1 TH1,1 kl.2(B)2 Ar

Design of test specimen

Insulating glass unit

External dimensions 1,230 mm x 1,480 mm

Pane configuration 6LSG / 12 / 4 / 12 / 6LSG

Gas filling in cavity Argon

Area related mass 40.4 kg/m²

Pane temperature 21°C

Test date 23rd of April 2014

Test surface S 1.25 m x 1.50 m = 1.88 m²

Test rig as per EN ISO 10140-5

Partition wall Double-leaf concrete wall, insert frame

Test noise pink noise

Volumes of test rooms V_S = 104 m³

V_R = 67.5 m³

Maximum sound reduction index

R_{w,max} = 62 dB (related to test surface)

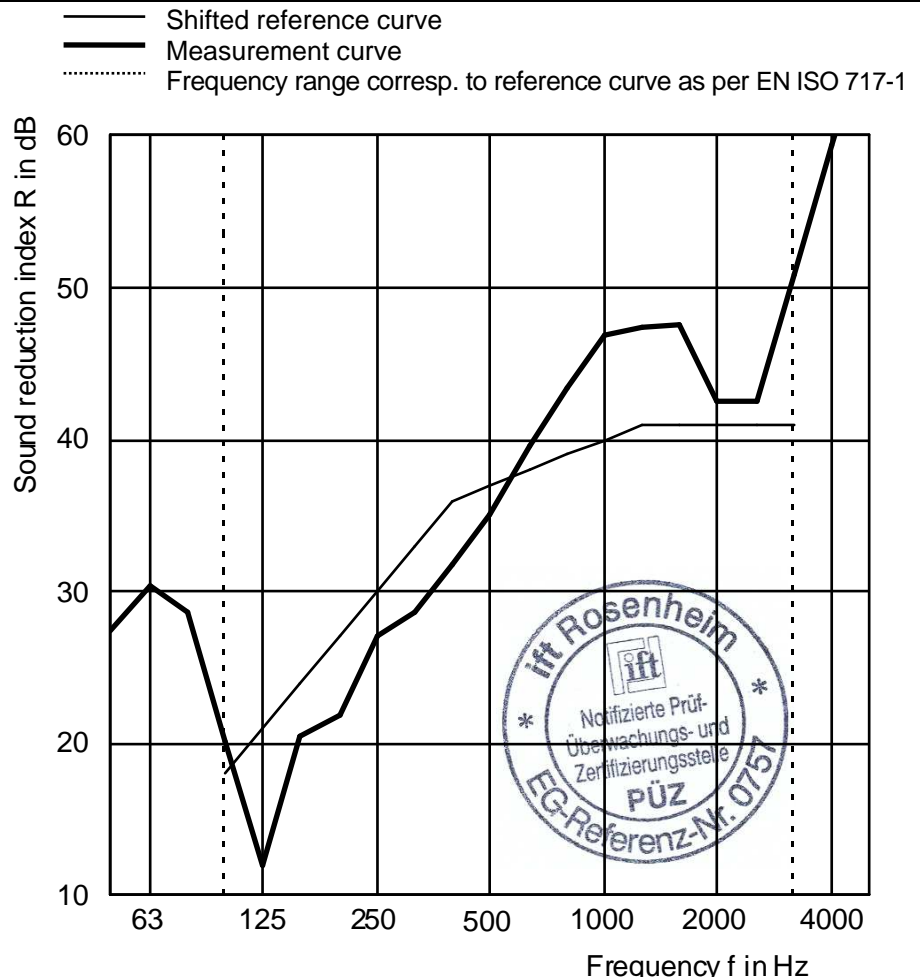
Mounting conditions

Glass mounted in test opening and held on both sides by glazing beads (25 mm x 25 mm); gap between test rig, glazing and glazing beads was completely filled with plastic sealant

Climate in test rooms 21 °C / 50 % RH

Static air pressure 962 hPa

f in Hz	R in dB
50	27.4
63	30.3
80	28.6
100	20.1
125	12.0
160	20.5
200	21.9
250	27.0
315	28.6
400	31.7
500	35.0
630	39.6
800	43.3
1,000	46.8
1,250	47.4
1,600	47.5
2,000	42.6
2,500	42.5
3,150	50.8
4,000	59.4
5,000	67.5



Rating according to EN ISO 717-1 (in third octave bands):

R_w (C;C_{tr}) = **37 (-3;-8) dB**

C_{50-3,150} = -3 dB; C_{100-5,000} = -2 dB; C_{50-5,000} = -2 dB

C_{tr,50-3,150} = -8 dB; C_{tr,100-5,000} = -8 dB; C_{tr,50-5,000} = -8 dB

Test report No.: 14-000251-PR01 (PB Z09-H01-04-en-02)

Page 7 of 7, Data Sheet No. Z9

ift Rosenheim

Laboratory for Building Acoustics

5. June 2014

Dipl. Ing. (FH) Andreas Preuss

Operating testing officer