Evidence of performance

Airborne sound insulation of building elements

Test Report
No. 13-001521-PR01
(PB 5-H01-04-en-01)

Client

SAINT-GOBAIN POLSKA Sp.Z.o.o.
ODDZIAL GLASSOLUTIONS
ul. Kolejowa 1
32-312 Jaroszowiec
Poland

Product	Insulating glass unit
Designation	SGG Climaplus Acoustic
External dimension (W x H)	1230 mm × 1480 mm
Configuration	44.2 LSG SI/16/6
Gas filling	Argon
Area related mass	35.5 kg/m²
Specials	-/-

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

$$R_w\ (C;\ C_{tr}) = \mathbf{42}\ (-2;-7)\ \text{dB}$$

ift Rosenheim
03.07.2013

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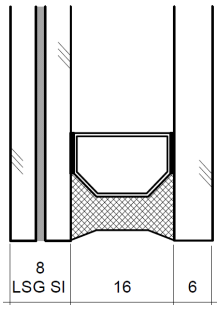
Building Acoustics

Basis

EN ISO 10140-1 : 2010
+A1:2012
EN ISO 10140-2 : 2010
EN ISO 717-1 : 1996+A1:2006

13-001521-PR01 (PB 5-H01-04-de-01) dated 26th of June 2013.

Representation



Instructions for use

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

Applicable for Germany

R_w corresponds to $R_{w,P}$ 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.

Contents

The test report contains a total of 7 pages:

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D-ZM-11349-01-00

1 Object

1.1 Description of test specimen (All dimensions in mm)

Component	Insulating glass unit
Product designation	SGG Climaplus Acoustic
External dimension (W x H)	1230 mm × 1480 mm
Visible Size (W x H)	1200 mm × 1450 mm
Total Thickness	
On the edge	31.1 mm
In the middle of pane	31.3 mm
Area related mass kg/m²	35.5 kg/m²
Configuration	44.2 LSG SI/16/6
Construction of laminated glass	4 mm Float – 0,76 mm Film – 4 mm Float
Type / Manufacturer of interlayer	Stadip Silence-Film, acc. to manufacturer
Pane temperature in ℃	25℃
Spacer	
Material	Aluminium
Manufacturer	Alu-Pro
Edge seals	Two planes, total width 11-12 mm
external Type	4050/4051, 0421283, 0522613-11
Manufacturer	FENZI
internal Type	4068-F
Manufacturer	FENZI
Edge cover	Edge cover 5-6 mm
Gas filling in cavity	acc. to Analysis at **ift**
Type of gas	Argon
Volume in %	98 %

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

1.2 Mounting in test rig

Test rig	Window test rig with suppressed flanking transmission acc. to EN ISO 10140-5: 2010; the test rig includes a 5 cm continuous acoustic break which is sealed in the test opening with elastic sealant.
Mounting of test specimen	Test specimen mounted by **ift** Laboratory for Building Acoustics.
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 samples were selected by the client
Quantity	1
Manufacturer	SAINT-GOBAIN POLSKA Sp.Z.o.o.
Date of manufacture / date of sampling	6th of June 2013
Responsible for sampling	Mrs. Seweryn, Anna
Delivery at **ift**	11th of June 2013 by the client via forwarding agency
ift registration number	34866/5

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: 1996 + A1:2006	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 : 2006-11

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.

Airborne sound insulation of building elements
Test Report 13-001521-PR01 (PB 5-H01-04-en-01) dated 03.07.2013
Client **SAINT-GOBAIN POLSKA Sp.Z.o.o.**
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Deviation	Due to weather conditions the room temperature in the testing laboratory was 25℃ and thus above the specified maximum temperature of 23℃.
Test noise	Pink noise
Measuring filter	One-third-octave band filter
Measurement limits	
Low frequencies	The dimensions of the receiving room full fills the recommended size 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 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 (total of 12 independent measurements).
Measurement equation A	$A = 0{,}16 \cdot \frac{V}{T}$ m²
Measurement of sound level difference	Minimum of 2 loudspeaker positions and rotating microphones.
Measurement equation R	$R = L_1 - L_2 + 10 \cdot \lg\frac{S}{A}$ in dB

KEY

A	Equivalent absorption area in m²
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 m³
S	Testing area of the specimen in m²

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	Type 229, 96 Ohm	Norsonic-Tippkemper
Amplifier	Type 235, 100 W	Norsonic-Tippkemper
Rotating microphone boom	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 2010. 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.

2.4 Testing

Date	18th of June 2013
Operating Testing Officer	Till Stübben

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}) = 42 (-2;-7) dB

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

$C_{50\text{-}3150}$	=	-3 dB	$C_{100\text{-}5000}$	=	-1 dB	$C_{50\text{-}5000}$	=	-2 dB
$C_{tr,50\text{-}3150}$	=	-7 dB	$C_{tr,100\text{-}5000}$	=	-7 dB	$C_{tr,50\text{-}5000}$	=	-7 dB

4 Instructions for use

4.1 Test value

Basis
DIN 4109:1989-11 Sound insulation in buildings, requirements and verifications
Basis
DIN 4109 Bbl1/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 40a the weighted sound reduction index R_w corresponds to the test value $R_{w,P,\ GLASS}$

$R_{w,P,\ GLASS}$ = 42 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, until the respective date, applicable parts of the standards series EN ISO 140 which describe laboratory tests. According to the two standard series, the test methods are identical.

ift Rosenheim
Laboratory for Building Acoustics
03.07.2013

Sound reduction index according to ISO 10140 - 2

Laboratory measurements of airborne sound insulation of building elements

Client: **SAINT-GOBAIN POLSKA Sp.Z.o.o.**
ODDZIAL GLASSOLUTIONS, 32-312 Jaroszowiec (Poland)

Product designation SGG Climaplus Acoustic

Design of test specimen

Insulating glass unit

External dimension	1230 mm × 1480 mm
Pane configuration	44.2 LSG SI/16/6
Filling in cavity	Argon
Area related mass	35.5 kg/m²
Pane temperature in	25℃

Test date	18th of June 2013
Test surface S	1.25 m × 1.50 m = 1.88 m^2
Test rig	as per EN ISO 10140-5
Partition wall	Double-leaf concrete wall
Test noise	pink noise
Volumes of test rooms	V_S = 109.9 m^3 V_E = 101.3 m^3

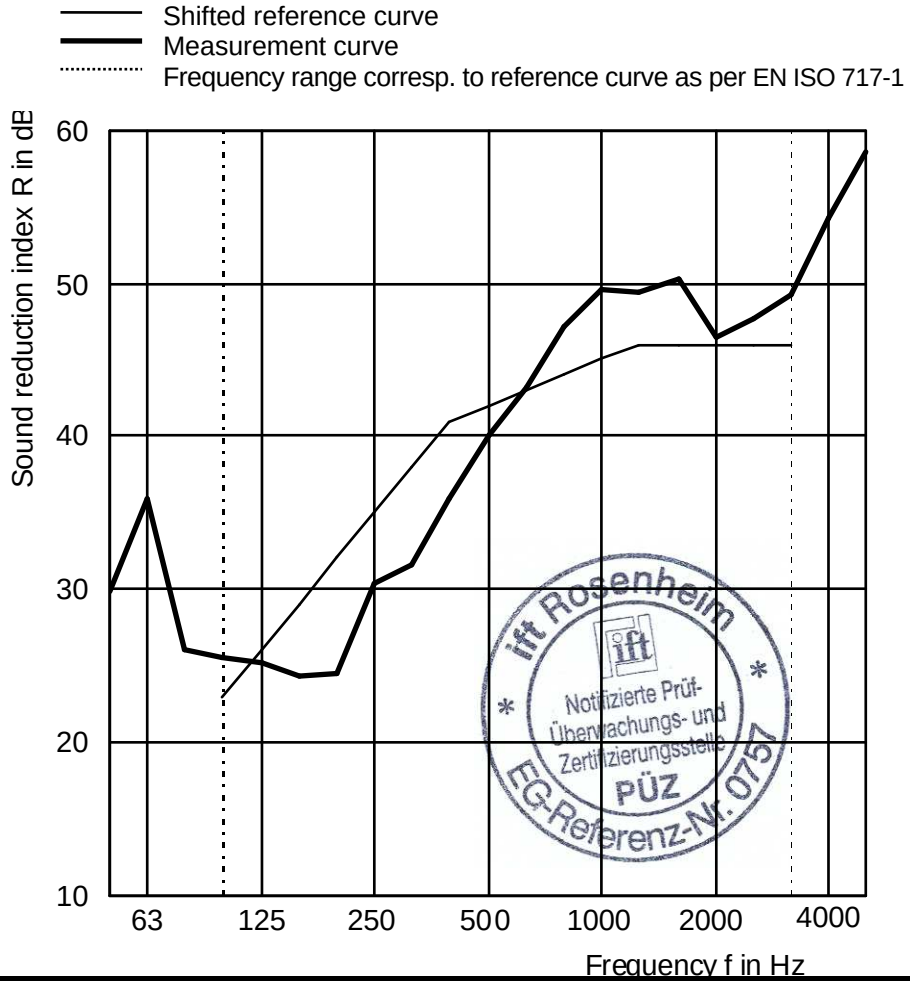
Maximum sound reduction index
$R_{w,max}$ = 62 dB (related to test surface)

Mounting conditions
Glass mounted in test opening and held on both sides by glazing beads (25 mm × 25 mm); glass edge sealed on both sides with plastic sealant

Climate in test rooms 25 ℃ / 60 % RF

Static air pressure 966 hPa

f in Hz	R in dB
50	29.8
63	36.0
80	26.1
100	25.6
125	25.2
160	24.2
200	24.5
250	30.4
315	31.6
400	35.9
500	40.1
630	43.1
800	47.1
1000	49.6
1250	49.5
1600	50.2
2000	46.5
2500	47.7
3150	49.2
4000	54.2
5000	58.6



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

R_w ($C;C_{tr}$) = 42 **(-2;-7) dB** $C_{50\text{-}3150}$ = -3 dB; $C_{100\text{-}5000}$ = -1 dB; $C_{50\text{-}5000}$ = -2 dB

$C_{tr,50\text{-}3150}$ = -7 dB; $C_{tr,100\text{-}5000}$ = -7 dB; $C_{tr,50\text{-}5000}$ = -7 dB

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3. Juli 2013

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