

Evidence of Performance
Airborne sound insulation of building components
Test Report
No. 13-002624-PR01
(PB 2-H01-04-en-01)

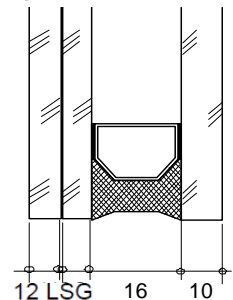


Client **SAINT-GOBAIN POLSKA Sp.Z.o.o.**
ODDZIAL GLASSOLUTIONS
 ul. Kolejowa 1
 32-312 Jaroszewiec
 Poland

Basis
 EN ISO 10140-1 : 2010
 +A1:2012
 EN ISO 10140-2 : 2010
 EN ISO 717-1 : 2013
 13-002624-PR01 (PB 2-H01-04-de-01) dated 08th of November 2013

Product	Insulating glass unit
Designation	SGG Climaplus Acoustic
Overall dimension (w x h)	1,230 mm x 1,480 mm
Configuration	66.2 LSG-Acoustic/16/10
Gas filling	Argon
Area related mass	55.9 kg/m ²
Specials	-/-

Representation



Instructions for use

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

Applicable for Germany
 R_w corresponds 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 any 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:

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

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



$$R_w (C; C_{tr}) = 44 (-1; -4) \text{ dB}$$

ift Rosenheim
 08.11.2013

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 Building Physics

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 Operating Testing Officer
 Building Acoustics

Airborne sound insulation of building components

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ODDZIAŁ GLASSOLUTIONS, 32-312 Jaroszewiec (Poland)

1 Object

1.1 Description of test specimen (All dimensions in mm)

Component	Insulating glass unit
Product designation	SGG Climaplust Acoustic
Overall 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	39.4 mm
In the middle of pane	40.2 mm
Area related mass kg/m ²	55.9 kg/m ²
Configuration	66.2 LSG-Acoustic/16/10
Configuration of laminated glass	6 mm Float – 0.76 mm Acoustic film – 6 mm Float
Type / Manufacturer of interlayer	Stadip-Silence, Sekisui
Temperature of pane in °C	19°C
Spacer	
Material	Aluminium
Manufacturer	Alu-Pro, A155NE6PCAC
Edge seals	Two planes, Total width 10-11 mm
External Type	4050/4051, A 0421613-s B 913164925
Manufacturer	FENZI
Internal Type	Butylver, 4068-F, 0408773
Manufacturer	FENZI
Edge cover	4-5 mm
Gas filling in cavity	According to Analysis at ift
Type of gas	Argon
Volume in %	95 %

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 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 closed-cell permanently resilient 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



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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 /	17-18.09.2013
Date of sampling	
Production line	Not specified
Responsible for sampling	Mrs. Pustuł, Anna
Delivery at ift	10th of October 2013 by the client via forwarding agency
ift registration number	35695/2

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/s:

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

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).

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Boundary conditions	As specified by the standard
Deviation	There are no deviations from the test method/s 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 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 (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

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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 19th of January 2012. The calibration is valid until 31st of December 2014. The sound level meter used was DKD calibrated by the company Norsonic Tippkemper (DKD - Deutscher Kalibrierdienst "German Calibration_Service") on 25th of March 2013.

2.4 Testing

Date 28th of October 2013
Operating testing officer Markus Schramm

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:

$$R_w (C;C_{tr}) = 44 (-1;-4) \text{ dB}$$

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

$$\begin{array}{lll}
 C_{50-3,150} = & -1 \text{ dB} & C_{100-5,000} = & 0 \text{ dB} & C_{50-5,000} = & 0 \text{ dB} \\
 C_{tr,50-3,150} = & -5 \text{ dB} & C_{tr,100-5,000} = & -4 \text{ dB} & C_{tr,50-5,000} = & -5 \text{ dB}
 \end{array}$$

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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 $R_{w,P}$ corresponds to the test value $R_{w,P, GLASS}$.

$$R_{w,P, GLASS} = 44 \text{ dB}$$

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, 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.

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Laboratory for Building Acoustics
08.11.2013

Sound reduction index according to ISO 10140 - 2

Laboratory measurements of airborne sound insulation of building components

Client::

SAINT-GOBAIN POLSKA Sp.Z.o.o.

ODDZIAL GLASSOLUTIONS, 32-312 Jaroszewiec Poland



Product designation SGG Climaplus Acoustic

Design of test specimen

Insulating glass unit

Overall dimensions 1,230 mm x 1,480 mm

Pane configuration 66.2 LSG-Acoustic/16/10

Filling in cavity Argon

Area related mass 55.9 kg/m²

Pane temperature 19°C

Test date 28th of October 2013

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

Test noise pink noise

Volumes of test rooms $V_S = 109.9 \text{ m}^3$
 $V_R = 101.3 \text{ m}^3$

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

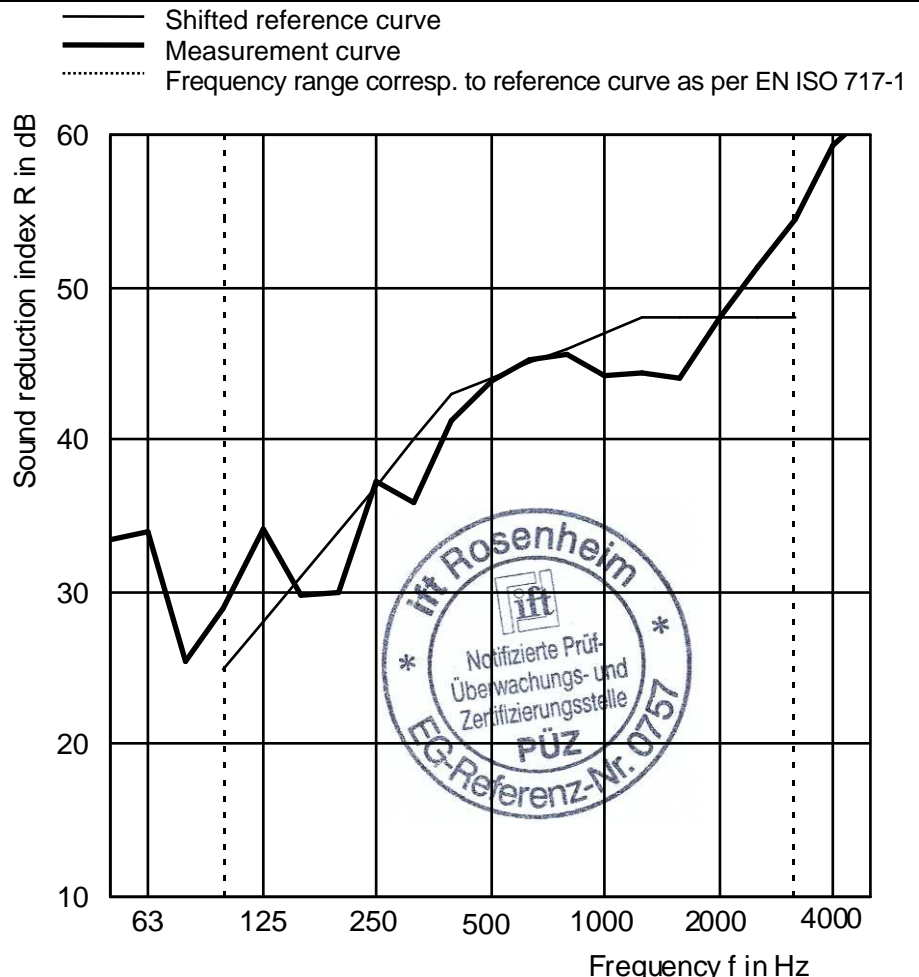
Mounting conditions

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

Climate in test rooms 20 °C / 55 % RH

Static air pressure 956 hPa

f in Hz	R in dB
50	33.4
63	33.9
80	25.5
100	28.9
125	34.2
160	29.8
200	29.9
250	37.2
315	35.9
400	41.3
500	43.8
630	45.2
800	45.5
1,000	44.2
1,250	44.3
1,600	44.0
2,000	48.0
2,500	51.4
3,150	54.5
4,000	59.2
5,000	61.6



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

$R_w(C;C_{tr}) = 44 (-1;-4) \text{ dB}$

$C_{50-3,150} = -1 \text{ dB}; C_{100-5,000} = 0 \text{ dB}; C_{50-5,000} = 0 \text{ dB}$

$C_{tr,50-3,150} = -5 \text{ dB}; C_{tr,100-5,000} = -4 \text{ dB}; C_{tr,50-5,000} = -5 \text{ dB}$

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Laboratory for Building Acoustics

8. November 2013

M.Eng., Dipl. Ing. (FH) Markus Schramm
Operating testing officer