

Classification report

Airbourne sound insulation of building elements

Test report 161 32407/Z8e*)

*) This is a translation of the test report No. 161 32407/Z8 dated 9th October 2006



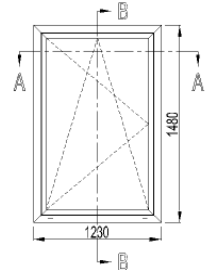
Client **Reynaers Aluminium N.V./S.A.**
Oude Liersbaan 266

2570 Duffel
Belgium

Basis

EN ISO 140-1:1997+A1:2004
EN 20140-3 :1995+A1:2004
EN ISO 717-1 : 1996-12

Representation



Instructions for use

This test report may be used to classify the sound insulation of building elements.

For germany DIN 4109:1989-11 is valid:

- R_w is equivalent to $R_{w,P}$,
 $R_{w,R} = R_{w,P} - 2 \text{ dB}$
- $R_{w,R}$ for „Bauregelliste“

Validity

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

Testing for sound insulation does not allow any statement to be made on further characteristics of the present structure which could define performance and quality.

Notes on publication

The ift notice "Conditions and notes for the use of ift test documents" applies.

The cover sheet can be used as a summary.

Product	Single window, one leaf
System designation	CS 38-SL
Size (W x H)	1230 mm x 1480 mm
Material	Aluminiumprofile with thermal break, uncoated
Opening	Tilt and turn
Rebate sealings	1 Centre seal, 1 Inside seal
Filling	Insulating glass unit , 12 LG Acoustic/20/8 LG Acoustic
Special features	-/-

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



$$R_w (C; C_{tr}) = 45 (0; -3) \text{ dB}$$

ift Rosenheim
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- 1 Object
 - 2 Procedure
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- Data sheet (1 page)



1 Object

1.1 Description of test specimen

Product	Single window, one leaf
Manufacturer*	Reynaers Aluminium V.V./S.A.
Date of manufacture*	Week 38/2006
Product charge*	Reynaers Aluminium Testcentre, Duffel, Belgium
System designation	CS 38-SL
Type of opening	Tilt and turn
Opening direction	Inside
Mass of Window	92,4 kg
Area related mass	50,7 kg/m ²
Frame member	
Frame size (W x H)	1230 mm x 1480 mm
Material	Aluminiumprofile with thermal break, uncoated
Profile number	Art. No. 002.3636.XX
Profile section (W x T)	48 mm x 90 mm
Casement member	
Casement size (W x H)	1174 mm x 1424 mm
Material	Aluminiumprofile with thermal break, uncoated
Profile number	Art. No. 002.1651.XX
Profile section (B x T)	52 mm x 75 mm
Rebate configuration	
Rebate drainage	Outside 3 x 3 drills Ø 8 mm
Rebate seal	1 Centre seal, 1 Inside seal
centre (Type)	Art. No. 080.9084.04
position	in the frame member
inside (Type)	Art. No. 080.844.04
position	in the casement member
Filling	Insulating glass unit
Type	Phonibel ST4248
Visible size (W x H)	995 mm x 1245 mm
Total thickness in the edge	41 mm
Total thickness in the middle	41 mm
Construction	12 LG Acoustic/20/8 LG Acoustic
Gas filling in cavity	acc. Analysis of ift Centre for acoustics
Gas	Air
Volume in %	100%
Construction of laminated glass*	66.2: 6 mm Float-0,76 Acoustic layer -6 mm Float 44.2: 4 mm Float-0,76 Acoustic layer -4 mm Float
Type of the acoustic layer	No declaration

Mounting of filling

Sealing system	Sealing profiles inside and outside
Inside: Type	Art. No. 080.9105.04
Outside: Type	Art. No. 080.9114.04
Ventilation	Bottom 3 slots 5 mm × 20 mm
Glazing bead	
Position	Inside
Type	Art. Nr. 002.0676.XX, Reynaers

Fittings

Type	Tilt and turn, Reynaers
Hinges/pivots	2
Locks	Hung side 1, lock side 3
Clamping force	<10 Nm

The description is based on the documentation of **ift** Centre for Acoustic. Numbers and names of material are given by the client (Further data from client are marked with *).

1.2 Mounting in the test opening

Test rig	Window test rig „Z-Wall“ with suppressed flanking transmission acc. to EN ISO 140-1; the test rig includes a mounting frame with 5 cm continuous acoustic break which is sealed in the test opening with plastic sealant.
Mounting of the object	Mounting by ift Centre for Acoustic
Mounting conditions	Joints are completely stuffed with plastic foam and sealed with plastic sealant type Perennator 2001 S grey
Mounting position	At the rate of 1/3 to 2/3 in the test opening
Opening direction	To receiving room
Preparation	The window was opened and closed repeatedly.

1.3 Representation of the test specimen

The structural details were examined solely on the basis of the characteristics to be classified. The illustrations are based on unchanged documentation provided by the client.

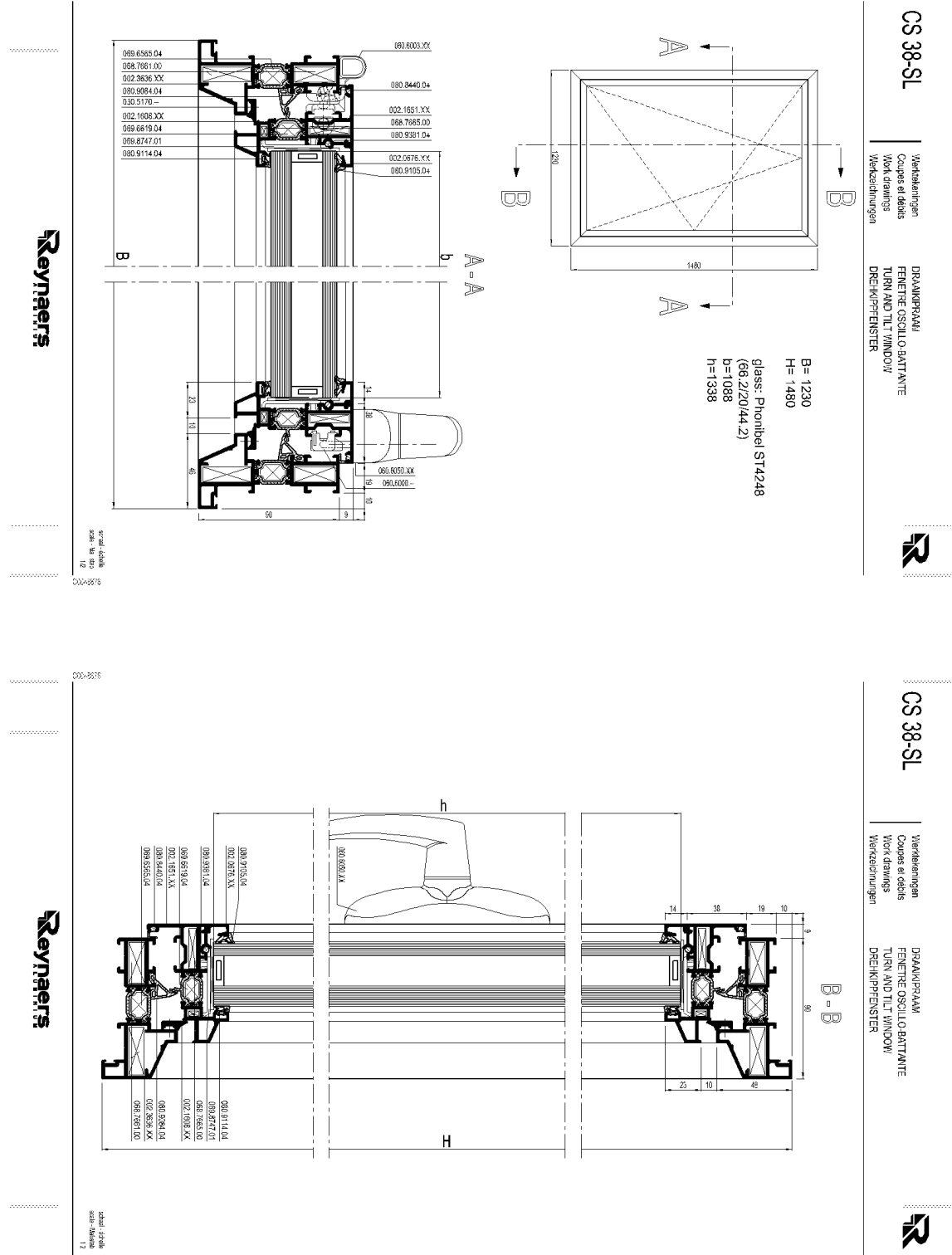




Fig. 2 Photography of the mounted element, taken by ift Centre for Acoustic

2 Procedure

2.1 Sampling

The specimen was selected by the client

Quantity	1
Delivered	4 th October 2006 by client via forwarding agency
Registry No.	20699

2.2 Process

Technical basis

EN ISO 140-1:1997 + A1:2004	Acoustic - Measurement of sound insulation in buildings and of building elements – part 1: Requirements for laboratory test facilities with suppressed flanking transmission
EN 20140-3:1995 + A1:2004	Acoustic - Measurement of sound insulation in buildings and of building elements – part 3: Laboratory measurements of airborne sound insulation of building elements
EN ISO 717-1 : 1996-12	Acoustics – Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound reduction

Corresponds to national german version:

DIN EN ISO 140-1:2005-03, DIN EN ISO 140-3:2005-03 und DIN EN ISO 717-1 : 1997-01
The processing and volume of the test is according to the principles of the „Arbeitskreises der bauakustischen Prüfstellen“ in agreement with NABau UA DIN 4109 Beiblatt 1 00.71.02.

Boundary conditions Up to the standard

Deviation No deviation to the test procedure

Test noise Pink noise

Filter 1/3rd octave band filter

Test limits

Background noise The background noise was measured in the receiving room.
The receiving room level L_2 was corrected according to EN ISO 140-3 : 2005 part 6.5.

Maximum sound insulation The Maximum sound insulation of the test rig is at least 15 dB higher than the measured sound reduction index of the test specimen. A correction was not carried out.

Test of reverberation time Arithmetic average: 2 tests on 2 speaker and 3 microphone positions (12 in total).

Equation A $A = 0,16 \cdot \frac{V}{T} \text{ m}^2$

Test of Sound level difference At least 2 speaker positions and on circulated paths moved microphones

Equation $R = L_1 - L_2 + 10 \cdot \lg \frac{S}{A} \text{ dB}$

Legend

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

2.3 Test equipment

Apparatus	Type	Producer
Integrating measurement device	Type Nortronic 840	Norsonic-Tippkemper
Microphone-preamplifier	Type 1201	Norsonic-Tippkemper
Microphone	Type 1220	Norsonic-Tippkemper
Calibrator	Type 1251	Norsonic-Tippkemper
Loudspeaker dodecahedron	Self made	-
Amplifier	Type E 120	FG Elektronik
Rotating microphone	Type 231-N-360	Norsonic-Tippkemper

2.4 Testing

Date 4th October 2006

Test engineer Bernd Saß

3 Detailed results

The values of the measured airborne sound reduction index of the tested window are drawn-up in the diagram of the annexed data sheet as a function of the frequency and are given in a table.

According to EN ISO 717-1:1996-12 the weighted sound reduction index R_w and the spectrum adaptation terms C and C_{tr} for the frequency range from 100 Hz to 3150 Hz can be calculated as follows:

$$R_w (C; C_{tr}) = 45 (0; -3) \text{ dB}$$

According to EN ISO 717-1:1996-12 following additional spectrum adaptation terms can be calculated:

$C_{50-3150}$	=	- dB	$C_{100-5000}$	=	1 dB	$C_{50-5000}$	=	- dB
$C_{tr,50-3150}$	=	- dB	$C_{tr,100-5000}$	=	-3 dB	$C_{tr,50-5000}$	=	- dB

4 Instruction for use

4.1 Safety margin

Basis

DIN 4109:1989-11 „Schallschutz im Hochbau, Anforderungen und Nachweise“

For requirements according to DIN 4109 : 1989-11 (“Eignungsprüfung I”) the weighted sound reduction index R_w is equivalent to $R_{w,P}$. After deduction of 2 dB safety margin the $R_{w,R}$ value is given by

$$R_{w,R} = 43 \text{ dB}$$

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.

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Centre for acoustic

9. October 2006

Sound reduction index according to ISO 140 - 3

Laboratory measurements of airborne sound insulation of building elements

Client: Reynaers Aluminium N.V./S.A., B-2570 Duffel

System designation: CS 38-SL



Construction of the specimen

Single window, one leaf

Outside dimension 1230 mm × 1480 mm

Material Aluminiumprofile with thermal break, uncoated

Opening Tilt and turn

Rebate seal 1 Centre seal, 1 Inside seal

Locks Hung side 1, lock side 3

Filling Insulating glass unit

Pane construction 12 LG Acoustic/20/8 LG Acoustic

Gas filling in pane Air

Date of the test 4th October 2006

Test opening S 1,25 m × 1,50 m = 1,88 m²

Test rig Acc. to EN ISO 140-1

Partition wall Double-leaf concrete wall, mounting frame

Test noise Pink noise

Volumes of the test rooms $V_e = 101 \text{ m}^3$
 $V_r = 67,5 \text{ m}^3$

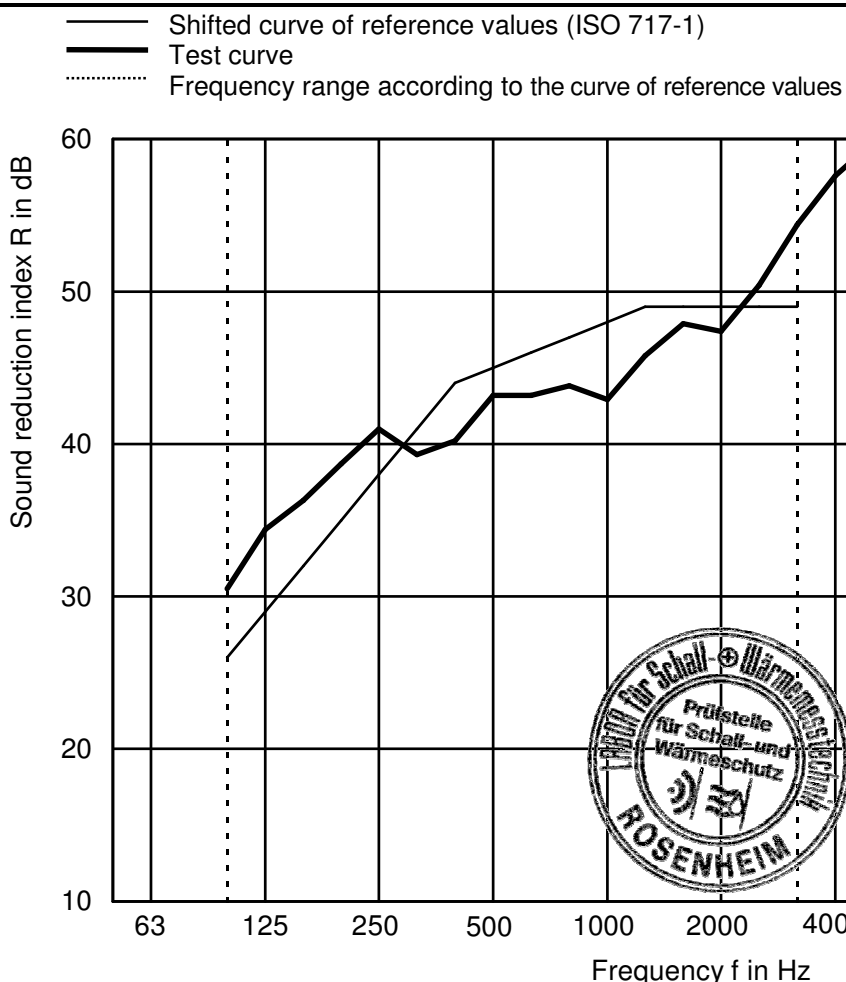
Maximum sound insulation $R_{w,max} = 62 \text{ dB}$ (related to the test area)

Mounting conditions

Element mounted in the test opening. Connection joints filled with foam and sealed with elastic sealants on both sides

Climate in the test rooms 21 °C / 55 % RF

f in Hz	R in dB
50	-
63	-
80	-
100	30,5
125	34,4
160	36,3
200	38,7
250	41,0
315	39,3
400	40,2
500	43,2
630	43,2
800	43,8
1000	42,9
1250	45,8
1600	47,9
2000	47,4
2500	50,4
3150	54,4
4000	57,6
5000	59,8



Evaluation according to EN ISO 717-1 (in 1/3rd octave bands):

$R_w (C; C_{tr}) = 45 (0; -3) \text{ dB}$

$C_{50-3150} = - \text{ dB}; C_{100-5000} = 1 \text{ dB}; C_{50-5000} = - \text{ dB}$

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

Test report No.: 161 32407/Z8e

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9. October 2006

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