

Evidence of Performance

Airborne sound insulation of building elements

Test report No.
10-001892-PR02-PB02-E02-04-en-03



Client **Renson Projects NV**
Industriezone 2 Vijverdam Maalbeekstraat 6

8790 Waregem
Belgium

Basis

EN ISO 10140-1 : 2010
EN ISO 10140-2 : 2010
EN ISO 717-1 : 1996+A1:2006
Test Report 10-001892-PR02-
E02-04-en-01 from 01 March
2011

Product	Ventilation grille with sound-absorbing slats
System designation	Louvre 447/150 - Linius L.170 ACS
External dimensions (W x H)	1,230 mm x 1,480 mm
Material	Aluminium
Orientation	Sound-absorbing slats facing noise side
Special features	-/-

Representation



Instructions for use

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

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



$$R_w (C; C_{tr}) = 9 (0; -1) \text{ dB}$$

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 structure 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.

ift Rosenheim
29 February 2012

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- 4 Instructions for use
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1 Object

1.1 Description of test specimen

Product	Ventilation grille with sound-absorbing slats
Product designation	Louvre 447/150 - Linus L.170 ACS
Orientation	Sound-absorbing slats facing noise side
Mass of the element	36.4 kg
Area related mass	20.0 kg/m ²
External dimensions (W x H)	1,230 mm × 1,480 mm
Total thickness	151 mm
Material	Aluminium-sheet 1.5 mm
Slats	37.8% " free air transfer "
Type	L.170 ACS
Number	8 with 7 openings
Configuration	Aluminium sheet slats, filled with mineral fibre, bottom side with perforated sheet
Total thickness of slats	45 mm
Free slat spacing	64.3 mm
Slat spacing - elevation	170 mm

The description is based on inspection of the test specimen at the **ift** Centre for Acoustics. Item designations / numbers as well as material specifications have been 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 elastic sealant.
Mounting of test specimen	Specimen mounted by ift Centre for Acoustics
Mounting conditions	Mounting in test opening, connecting joints filled with foam and sealed on both sides by application of elastic sealant.
Mounting position	externally flush in test opening.
Orientation	absorbing reveal towards source room side (noise side).
Preparation	no special preparation required.

1.3 Representation of test specimen

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

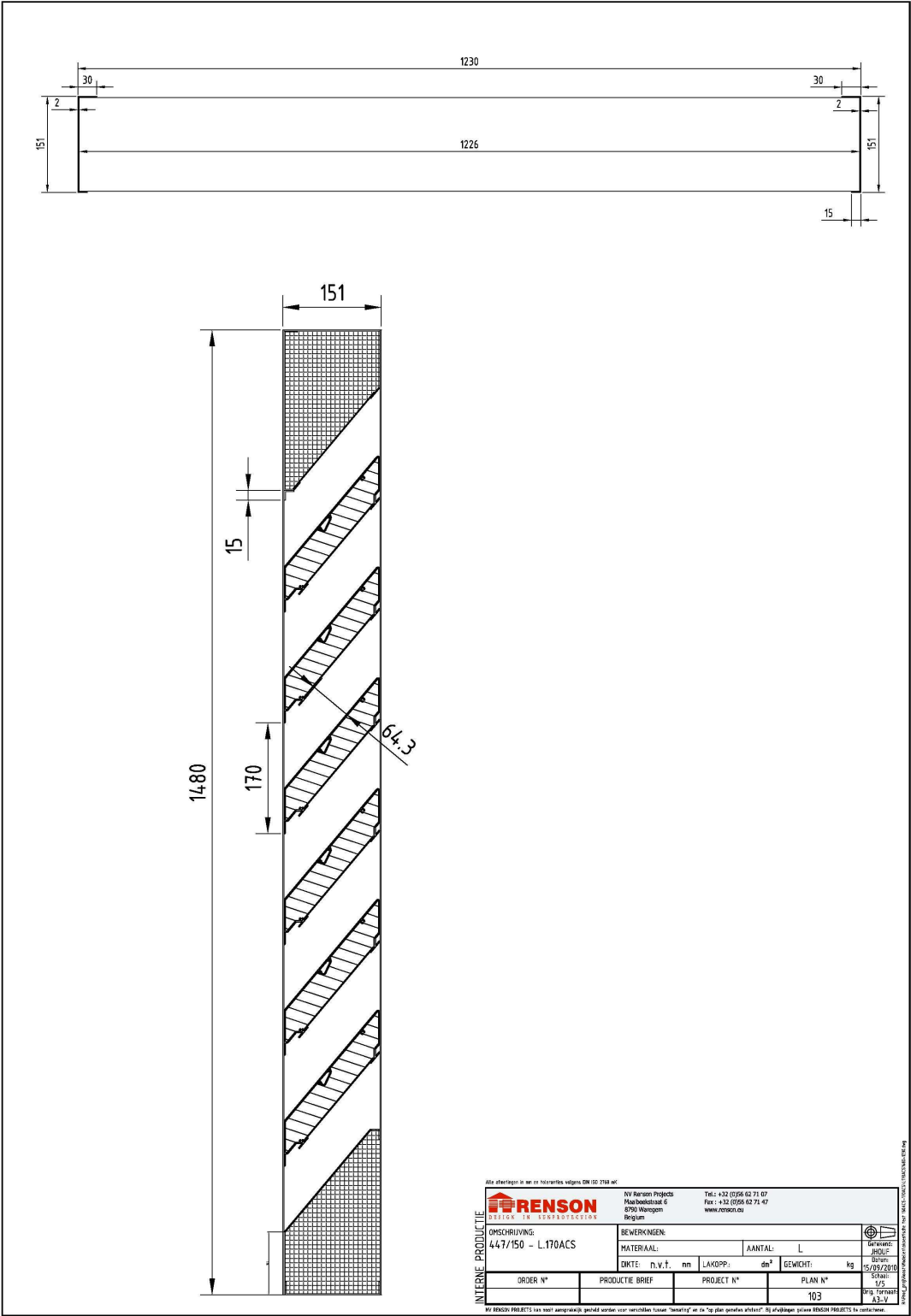


Fig. 1 Vertical cross-section



Receiving room side



Source room side

Fig. 2 Photographs of the mounted element, taken by ift Centre for Acoustics

2 Procedure

2.1 Sampling

Sampling	The samples were selected by the client.
Quantity	1
Manufacturer	Renson B.V.
Manufacturing plant	Renson B.V.
Date of manufacture / date of sampling	30/11/10
Production line	Renson B.V.
Delivery at ift	10 December 2010 by client via forwarding agency
ift registration number	29411-2

2.2 Process

Basis

- EN ISO 10140-1:2010 Acoustics; Laboratory measurement of sound insulation of building elements - Part 1: Application rules for specific products (ISO 10140-1:2010)
- 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 10140-1:2010-12, DIN EN ISO 10140-2:2010-12 und DIN EN ISO 717-1 : 2006-11

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 rig 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	$A = 0,16 \cdot \frac{V}{T} \text{ m}^2$
Measurement of sound level difference	Minimum of 2 loudspeaker positions and rotating microphones.
Measurement equation	$R = L_1 - L_2 + 10 \cdot \lg \frac{S}{A} \text{ dB}$

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	Test surface of specimen in m ²

2.3 Test equipment

Device	Type	Manufacturer
Integrating sound meter	Typ Nortronic 121	Fa. Norsonic-Tippkemper
Microphone preamplifiers	Typ 1201	Fa. Norsonic-Tippkemper
Microphone unit	Typ 1220	Fa. Norsonic-Tippkemper
Calibrator	Typ 1251	Fa. Norsonic-Tippkemper
Dodecahedron loudspeakers	Own design	-
Amplifier	Typ E120	Fa. FG Elektronik
Rotating microphone boom	Own design / Type 231-N-360	Fa. Norsonic-Tippkemper

The ift Centre for 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. 31423, was calibrated by the Dortmund Eichamt (calibration agency) on 19 January 2010. The calibration is valid until 31 December 2012.

2.4 Testing

Date	21 December 2010
Test engineer	Bernd Saß

3 Detailed results

The values of the measured sound reduction index of the tested element 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 from 100 Hz to 3150 Hz obtained by calculation are as follows:

$$R_w (C; C_{tr}) = 9 (0; -1) \text{ dB}$$

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

$C_{50-3150}$	=	0 dB	$C_{100-5000}$	=	0 dB	$C_{50-5000}$	=	0 dB
$C_{tr,50-3150}$	=	-1 dB	$C_{tr,100-5000}$	=	-1 dB	$C_{tr,50-5000}$	=	-1 dB

Upon request by the client and in deviation from the evaluation method as per EN ISO 717-1, the weighted sound reduction index R_w was additionally evaluated in steps of 1/10- dB; the result obtained from the 1/10 dB steps is marked with an * and is:

$$R_w^* = 9,8 \text{ dB}$$

4 Instructions for use

4.1 Test standards

The standard series EN ISO 10140:2010 supersedes those, until the date of publication, 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
Centre for Acoustics
29. February 2012

Sound reduction index according to ISO 10140 - 2

Laboratory measurements of airborne sound insulation of building elements

Client: Renson Projects NV, B-8790 Waregem

Product designation Louvre 447/150 - Linius L.170 ACS



Design of test specimen

Ventilation grille with sound-absorbing slats

Overall dimensions 1,230 mm × 1,480 mm

Total thickness 151 mm

Area related mass 20.0 kg/m²

Material Aluminium

Orientation Sound-absorbing slats facing noise side

Test date 21 December 2010

Test surface S 1.25 m × 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 = 104 m³

V_E = 67.5 m³

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

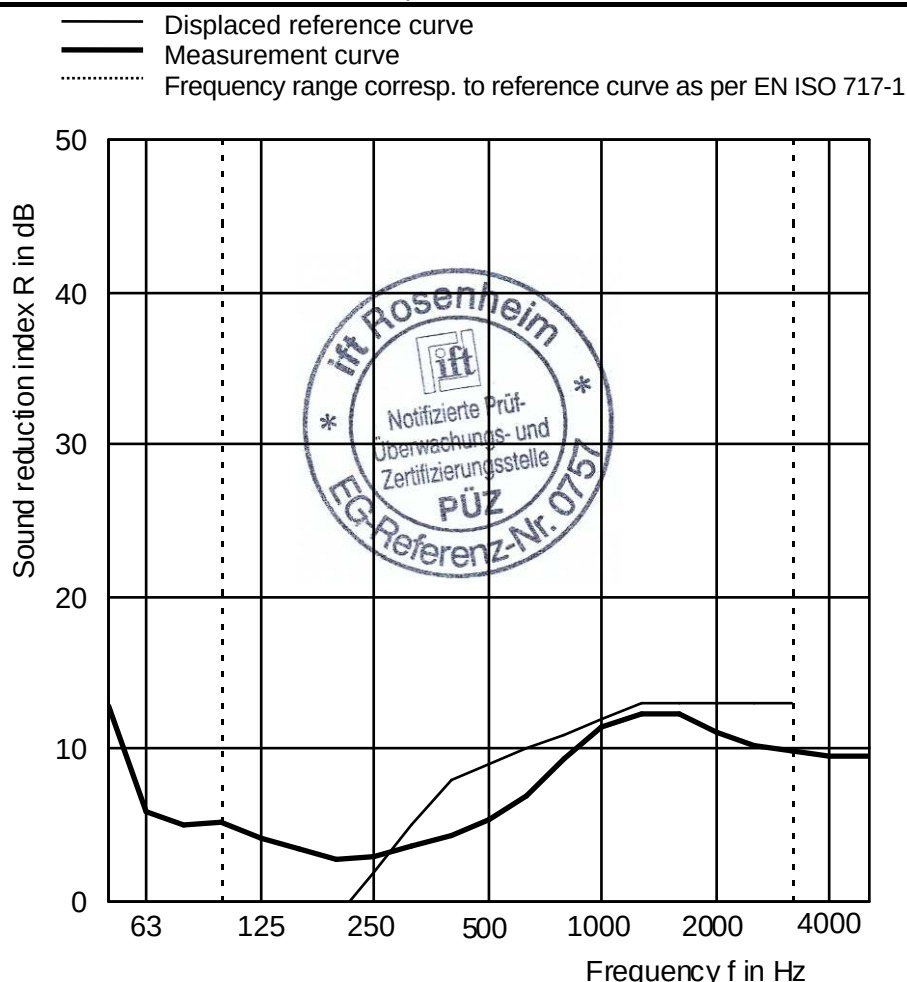
Mounting conditions

Element externally flush-mounted in test opening and fixed by wedges. Connecting joints filled with foam and sealed with plastic sealants on both sides

Climate in test rooms 21 °C / 30 % RF

Static air pressure 954 hPa

f in Hz	R in dB
50	12.9
63	5.9
80	5.0
100	5.3
125	4.2
160	3.5
200	2.8
250	2.9
315	3.6
400	4.3
500	5.4
630	7.0
800	9.4
1000	11.5
1250	12.3
1600	12.4
2000	11.2
2500	10.2
3150	9.9
4000	9.6
5000	9.5



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

R_w (C;C_{tr}) = 9 (0;-1) dB
C₅₀₋₃₁₅₀ = 0 dB; C₁₀₀₋₅₀₀₀ = 0 dB; C₅₀₋₅₀₀₀ = 0 dB
C_{tr,50-3150} = -1 dB; C_{tr,100-5000} = -1 dB; C_{tr,50-5000} = -1 dB

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Data sheet No. Z2

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29 february 2012

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