Evidence of Performance

Airborne sound insulation of building elements

Test report 164 38195/3e

This test report is a translation of test report 164 38195/3 dated 06th April 2009

Client

Renson Ventilation NV
Industriezone 2 Vijverdam Maalbeekstraat 10

8790 Waregem
Belgium

Basis

EN ISO 140-1:1997+A1:2004
EN 20140-3 :1995+A1:2004
EN ISO 717-1 : 1996+A1:2006

Product	Ventilation grille with sound-absorbing slats
System designation	Type 446/150 (Linius L.150 ACE)
Dimensions (w x h)	1230 mm × 1480 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}



$$R_w\ (C;\ C_{tr}) = 11\ (-1;-2)\ \text{dB}$$

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.

Contents

The test report contains a total of 8 pages:

1 Object
2 Procedure
3 Detailed results
Data sheet (1 page)

ift Rosenheim
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1 Object

1.1 Description of test specimen

Product	Ventilation grille with sound-absorbing slats
Product designation	Type 446/150 (Linius L.150 ACE)
Orientation	Sound-absorbing slats facing noise side
Mass of the element	45.3 kg
Area related mass	24.9 kg/m²
Dimensions (w x h)	1230 mm × 1480 mm
Total thickness	151 mm
Material	Aluminium sheet 1.5 mm
Slats	34.3% "free air transfer"
Type	L.150 ACE
Number	9 with 8 openings
Configuration	Aluminium sheet slats, filled with mineral fibre, bottom side with perforated sheet
Total thickness of slats	45 mm
Free slat spacing	51.4 mm
Slat spacing - elevation	150 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. (Further manufacturer data are marked with *))

1.2 Mounting in test rig

Test rig	Window test rig with suppressed flanking transmission acc. to EN ISO 140-1; the test rig includes a 5 cm continuous acoustic break which is sealed in the test opening with plastic sealant.
Mounting of specimen	Specimen mounted by **ift** Centre for Acoustics and employees of the client.
Mounting conditions	Mounting in test opening, connecting joints foamed 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 the 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.

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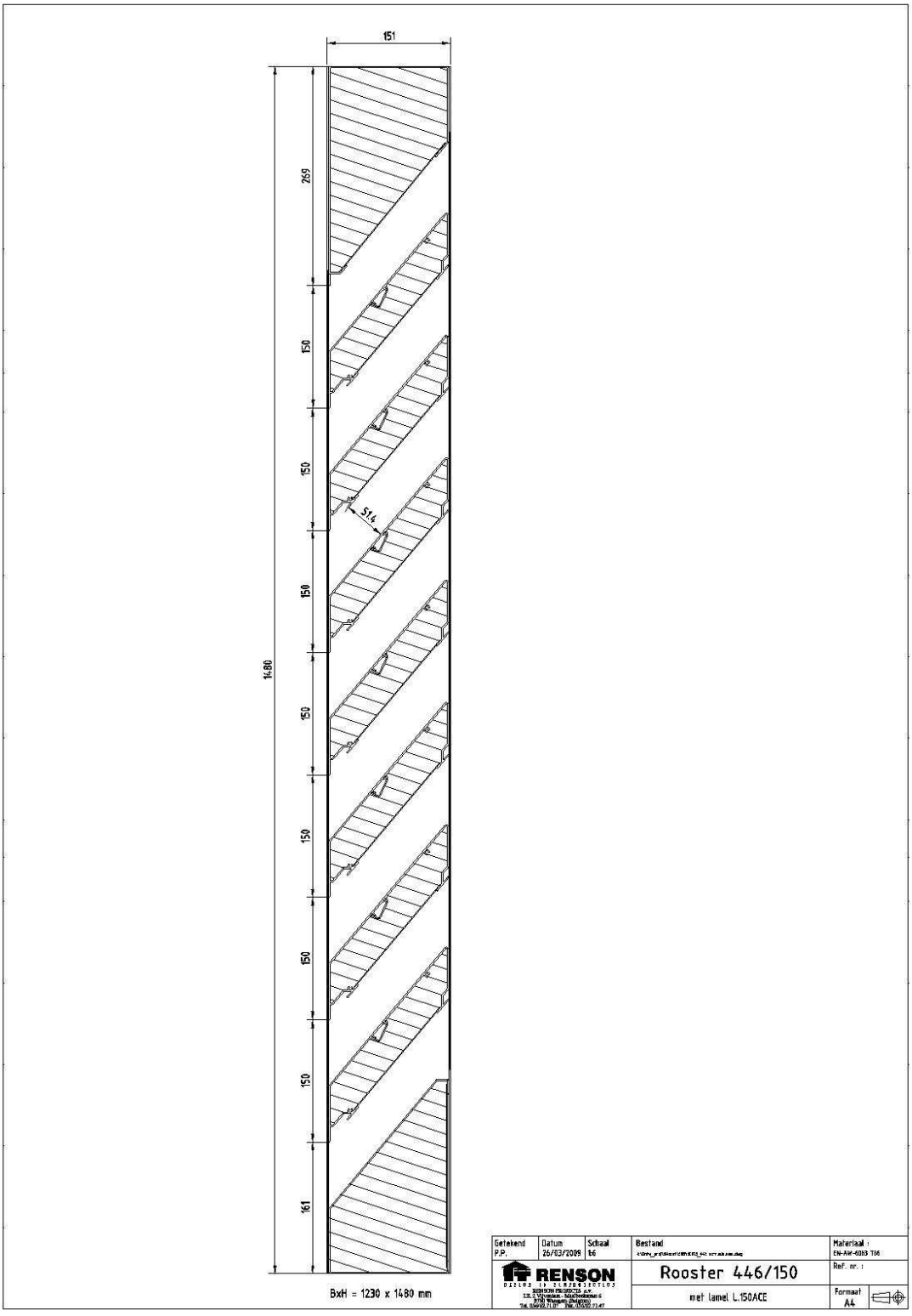


Fig. 1 Vertical cross-section



Receiving room side



Source room side

Fig. 2 Photography 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.
Factory	Renson B.V.
Date of manufacture / date of sampling*	26 February 2009
Production line	Renson B.V.
Delivered to **ift**	9 March 2009 by client via forwarding agency
ift registration number	25551/2

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2.2 Process

Basis

EN ISO 140-1:1997 + A1:2004 Acoustics; 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 Acoustics; 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 + A1:2006 Acoustics; Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation

Corresponds to the national German versions:

DIN EN ISO 140-1:2005-03, DIN EN ISO 140-3:2005-03 und DIN EN ISO 717-1 : 2006-11

Boundary conditions	as per standard specifications
Deviation	There have been no deviations from the test method and test conditions, respectively
Test noise	Pink noise
Measuring filter	one-third-octave band filter
Test limits	
Measurement limits	
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 DIN EN 20140-3:1995 + A1:2004 clause 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. 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	$R = L_1 - L_2 + 10 \cdot \lg \frac{S}{A}$ dB

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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	Test surface of specimen in m²

2.3 Measuring and test equipment

Device	Type	Manufacturer
Integrating sound meter	Typ Nortronic 840	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	Typ 229, 96 Ohm	Fa. Norsonic-Tippkemper
Amplifier	Typ 235, 100 W	Fa. Norsonic-Tippkemper
Rotating microphone boom	Typ 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 January 2007. The sound level meter used, Series No. 24842 was calibrated by the Dortmund Eichamt (calibration agency) on 16 September 2008. The calibration is valid until 31 December 2010.

2.4 Testing

Date	12 March 2009
Test engineer	Bernd Saß

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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 Rw and the spectrum adaptation terms C and Ctr for the frequency range from 100 Hz to 3150 Hz obtained by calculation are as follows:

$$\mathbf{R_w\ (C;C_{tr}) = 11\ (-1;-2)\ dB}$$

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

$C_{50\text{-}3150}$	=	-1 dB	$C_{100\text{-}5000}$	=	0 dB	$C_{50\text{-}5000}$	=	0 dB
$C_{tr,50\text{-}3150}$	=	-2 dB	$C_{tr,100\text{-}5000}$	=	-2 dB	$C_{tr,50\text{-}5000}$	=	-2 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 additionnally evaluated in steps of 1/10- dB; the result obtained from the 1/10 dB steps is marked with an * and is:

$$\mathbf{R_w^* = 11{,}4\ dB}$$

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09 June 2009

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Sound reduction index according to ISO 140 - 3

Laboratory measurement of airborne sound insulation of building elements

Client: Renson Ventilation NV, B-8790 Waregem

System designation Type 446/150 (Linius L.150 ACE)

Design of test specimen

Ventilation grille with sound-absorbing slats

Overall dimensions	1230 mm × 1480 mm
Total thickness	151 mm
Area related mass	24.9 kg/m²
Material	Aluminium
Orientation	Sound-absorbing slats facing noise side

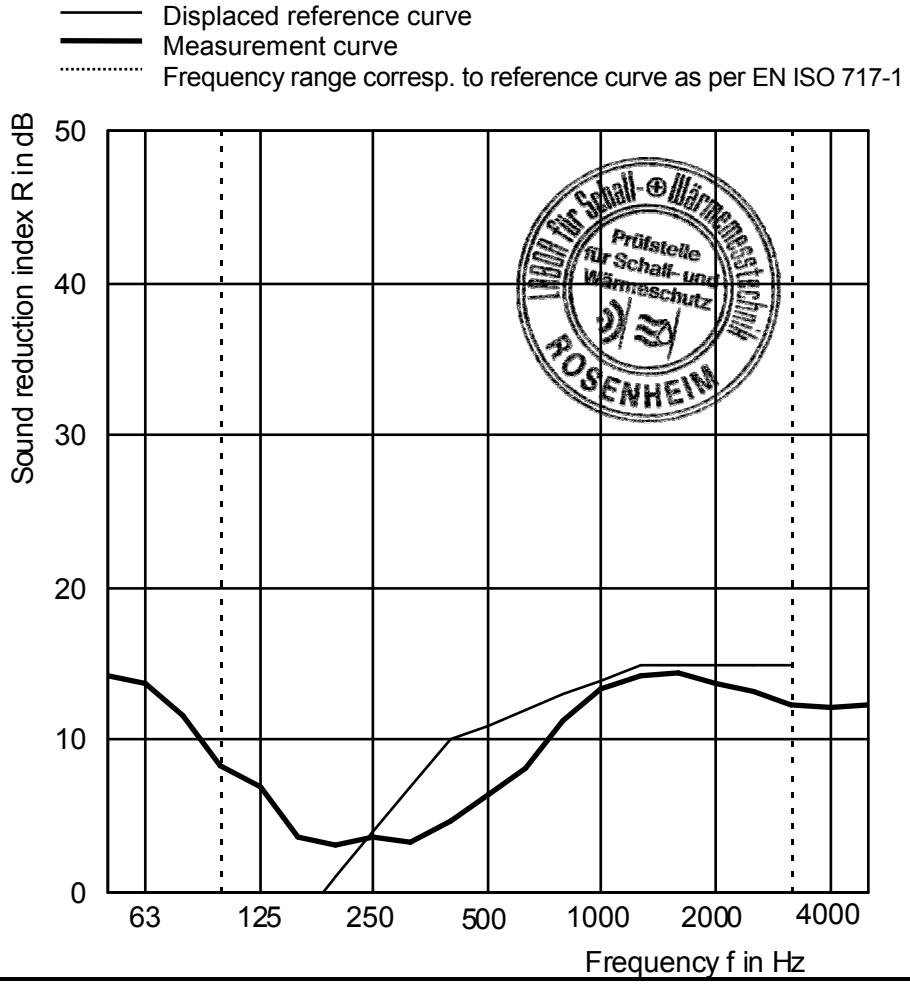
Test date	12 March 2009
Test surface S	1.25 m × 1.50 m = 1.88 m^2
Test rig	as per EN ISO 140-1
Partition wall	Double-leaf concrete wall
Test noise	pink noise
Volumes of test rooms	V_S = 109.9 m^3 V_E = 101.3 m^3

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

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

Climate in test rooms 20 °C / 35 % RF

f in Hz	R in dB
50	14.3
63	13.8
80	11.7
100	8.3
125	6.9
160	3.7
200	3.2
250	3.6
315	3.3
400	4.7
500	6.4
630	8.1
800	11.3
1000	13.4
1250	14.2
1600	14.5
2000	13.8
2500	13.2
3150	12.4
4000	12.1
5000	12.4



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

R_w ($C;C_{tr}$) = 11 (-1;-2) dB $C_{50\text{-}3150}$ = -1 dB; $C_{100\text{-}5000}$ = 0 dB; $C_{50\text{-}5000}$ = 0 dB

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

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