

# Evidence of Performance

Airborne sound insulation of building elements

Test report 164 38195/8e



This test report is a translation of test report 164 38195/8 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 446/225 (Linus L.150 ACL)
Dimensions (w x h)	1230 mm x 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  $C_{tr}$



$$R_w (C; C_{tr}) = 15 (-1; -4) \text{ dB}$$

## 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  
09 June 2009

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## 1 Object

### 1.1 Description of test specimen

<b>Product</b>	Ventilation grille with sound-absorbing slats
Product designation	Type 446/225 (Linus L.150 ACL)
Orientation	Sound-absorbing slats facing noise side
Mass of the element	52.8 kg
Area related mass	29.0 kg/m <sup>2</sup>
Dimensions (w x h)	1230 mm × 1480 mm
Total thickness	226 mm
Material	Aluminium sheet 1.5 mm
<b>Slats</b>	34.3% "free air transfer"
Type	L.150 ACE
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	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 <b>ift</b> 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.





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 <b>ift</b>	9 March 2009 by client via forwarding agency
<b>ift</b> registration number	25551/4

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

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 <sup>2</sup>
L <sub>1</sub>	Sound pressure level source room in dB
L <sub>2</sub>	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 <sup>3</sup>
S	Test surface of specimen in m <sup>2</sup>

**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

### 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:

$$R_w (C; C_{tr}) = 15 (-1; -4) \text{ dB}$$

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

$C_{50-3150}$	=	-1 dB	$C_{100-5000}$	=	-1 dB	$C_{50-5000}$	=	-1 dB
$C_{tr,50-3150}$	=	-4 dB	$C_{tr,100-5000}$	=	-4 dB	$C_{tr,50-5000}$	=	-4 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:

$$R_w^* = 15,1 \text{ dB}$$

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Centre for Acoustics  
09 June 2009



# 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 446/225 (Linus L.150 ACL)



## Design of test specimen

Ventilation grille with sound-absorbing slats

Overall dimensions 1230 mm × 1480 mm

Total thickness 226 mm

Area related mass 29.0 kg/m<sup>2</sup>

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<sup>2</sup>

Test rig as per EN ISO 140-1

Partition wall Double-leaf concrete wall

Test noise pink noise

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

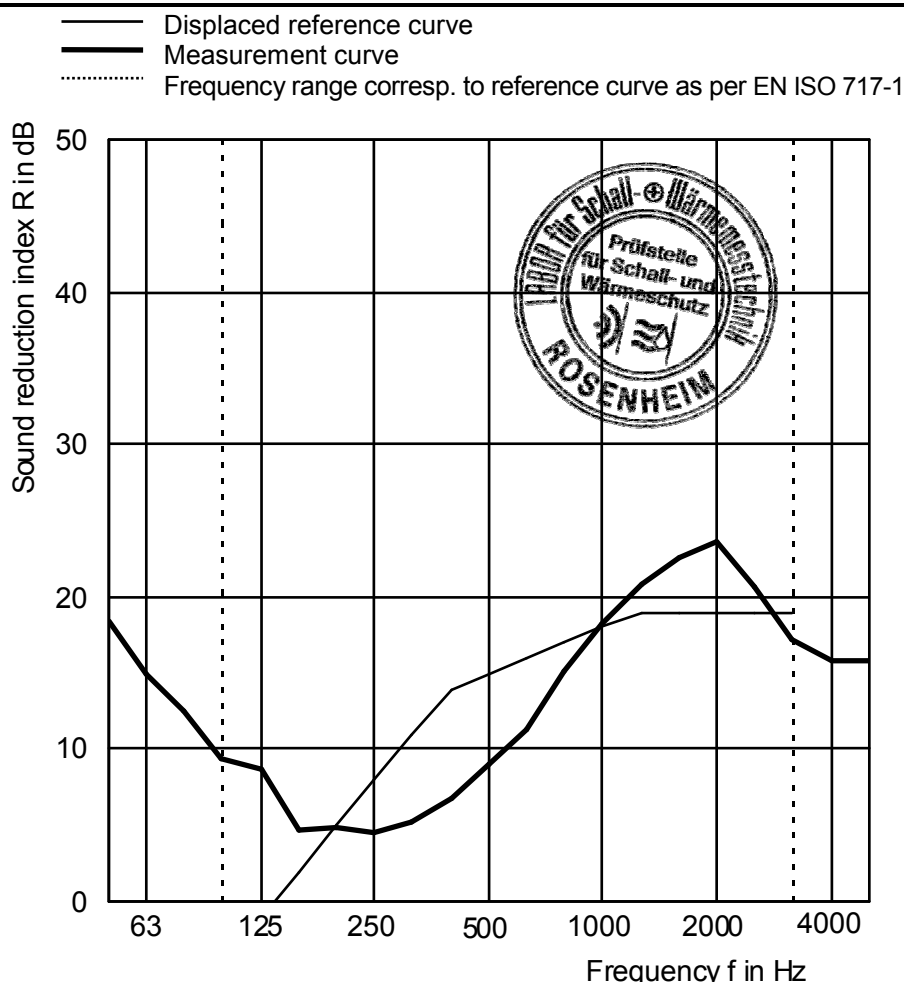
Maximum sound reduction index  
 $R_{w,max} = 62 \text{ dB}$  (related to test surface)

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	18.4
63	15.0
80	12.5
100	9.4
125	8.7
160	4.8
200	4.9
250	4.5
315	5.2
400	6.8
500	9.1
630	11.3
800	15.2
1000	18.2
1250	20.8
1600	22.5
2000	23.7
2500	20.6
3150	17.2
4000	15.8
5000	15.8



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

$R_w (C; C_{tr}) = 15 (-1; -4) \text{ dB}$

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

$C_{tr,50-3150} = -4 \text{ dB}$ ;  $C_{tr,100-5000} = -4 \text{ dB}$ ;  $C_{tr,50-5000} = -4 \text{ dB}$

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9. June 2009

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