



THERMAL PHYSICS, ACOUSTICS AND ENVIRONMENT DEPARTMENT  
THERMAL PHYSICS, ACOUSTICS AND ENVIRONMENT LABORATORY

## TESTS REPORT N° LZF00 - 01979/19/Z00NZF

This report was issued in four copies, two of which was received by the Client and two were left at the ITB.

Client:

*Aluminium Factory SIA*

Client address:

*Radiostacija iela 17, Ulbroka, Stopinu novads, Latvia*

### Information about test item

Test item:

*ALFADUR panels*

Date of receipt:

*01.07.2019*

Sampling protocol n°:

*LZF00-01979/19/Z00NZF*

Receipt procedure:

*Management Procedure ZLB n° 18, test object sampling and delivered by the Customer, approved for testing by Laboratory*

### Information about tests

Test commencement date:

*04.07.2019*

Test completion date:

*05.07.2019*

Test method/ procedure:

*PN – EN ISO 10140 – 2:2011 „Acoustics – Laboratory measurement of sound insulation of building elements – Part 2: Measurement of airborne sound insulation”*

**TEST ITEM DESCRIPTION:**

The subject of the test was the panels ALFADUR 46 and ALFADUR 50. The figures on page 3 show the the section view (both figures were provided by the Client).

**TEST RESULTS**

Measured features	Test results	
Sound insulation	$R_w(C;C_{tr})$ [dB] (measurement number)	Page
ALFADUR – 46 dimensions: 3000 ×1500 mm Sample n° 1/LZF00 - 01979/19/Z00NZF	46(-2;-6) (481.19)	page 4
ALFADUR – 50 dimensions: 3000 ×1500 mm Sample n° 2/LZF00 - 01979/19/Z00NZF	42(-3;-7) (478.19)	page 5

Enlarged uncertainty at a confidence level of 95% and with a coverage factor of  $k=2$ .

The result and its uncertainty apply only to the test samples. The value of the uncertainty cannot be directly attributed to the level of characteristics of the product, because the laboratory doesn't have any knowledge about the variability of its population, but only about the sample to be tested.



## Sound reduction index according to PN-EN ISO 10140-2:2011

Laboratory measurements of airborne sound insulation of building elements

Client: Aluminium Factory, SIA

Radiostacijas iela 17, LV-2130 Ulbroka, Stopinu novads, Latvi

Test specimen mounted by: NA ITB

Description of the test facility, test specimen and test arrangement:

ALFADUR - 46

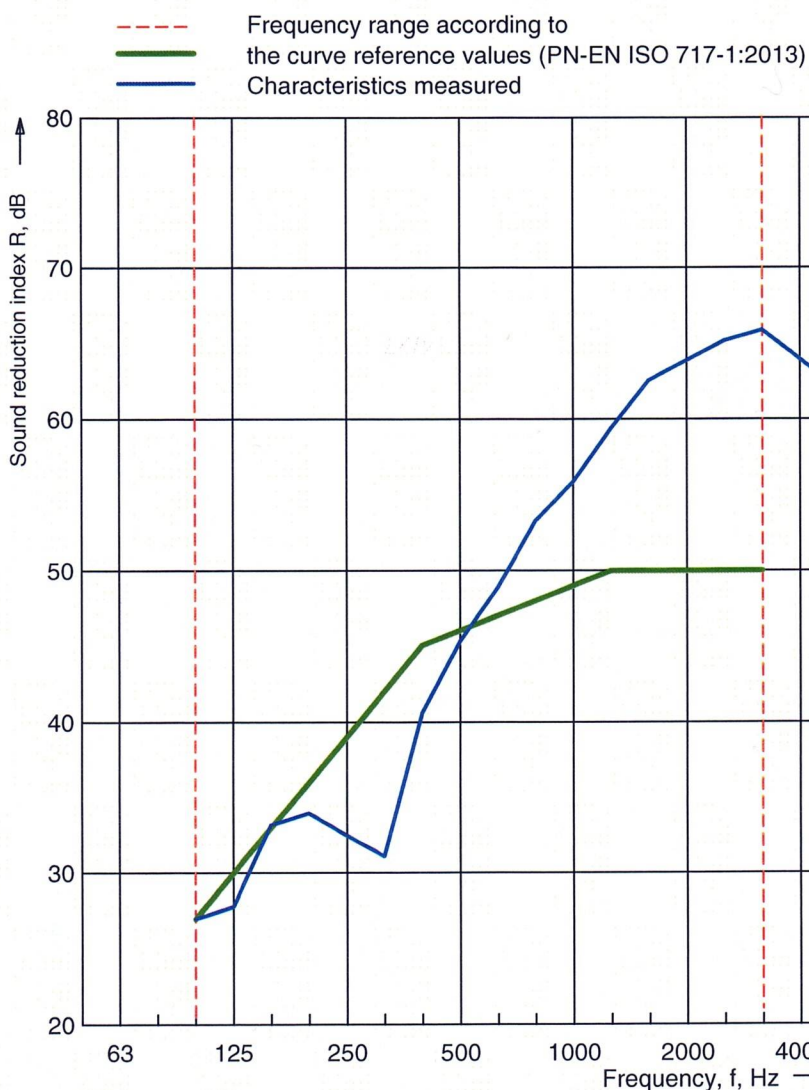
dimensions: 3000 1500 mm

Sample no 1/LZF00 - 01979/19/Z00NZF

Area of test specimen: 4,50 m<sup>2</sup>  
Mass per unit area: --- kg/m<sup>2</sup>

Test room:	source	receive
Volume, m <sup>3</sup> :	87,5	51,6
Air temperature, °C:	23,6	23,9
Air humidity, %:	51,4	52,2

Frequency f [Hz]	R 1/3 octave [dB]
50	---
63	---
80	---
100	27,0
125	27,8
160	33,2
200	34,0
250	32,5
315	31,1
400	40,6
500	45,3
630	48,9
800	53,3
1000	55,9
1250	59,4
1600	62,6
2000	63,9
2500	65,2
3150	65,9
4000	64,0
5000	62,0



Rating according to PN-EN ISO 717-1:2013

 $R_w(C;C_{tr}) = 46 (-2; -6) \text{ dB}$  $C_{50-3150} = \text{--- dB}$  $C_{50-5000} = \text{--- dB}$  $C_{100-5000} = -1 \text{ dB}$  $C_{tr,50-3150} = \text{--- dB}$  $C_{tr,50-5000} = \text{--- dB}$  $C_{tr,100-5000} = -6 \text{ dB}$ Single number index and its uncertainty  $U_{95}$  determined in accordance with PN-EN ISO 12999-1:2014:  $R_w = 46,6 \text{ dB} \pm 0,8 \text{ dB}$ Building Research Institute Group of the Testing Laboratories  
Thermal Physics, Acoustics and Environment Laboratory

Test No.: 481.19

Date of analysis: 2019-07-05

Signature: Marcin Marzec



## Sound reduction index according to PN-EN ISO 10140-2:2011

Laboratory measurements of airborne sound insulation of building elements

Client: Aluminium Factory, SIA

Radiostacijas iela 17, LV-2130 Ulbroka, Stopinu novads, Latvi

Test specimen mounted by: NA ITB

Description of the test facility, test specimen and test arrangement:

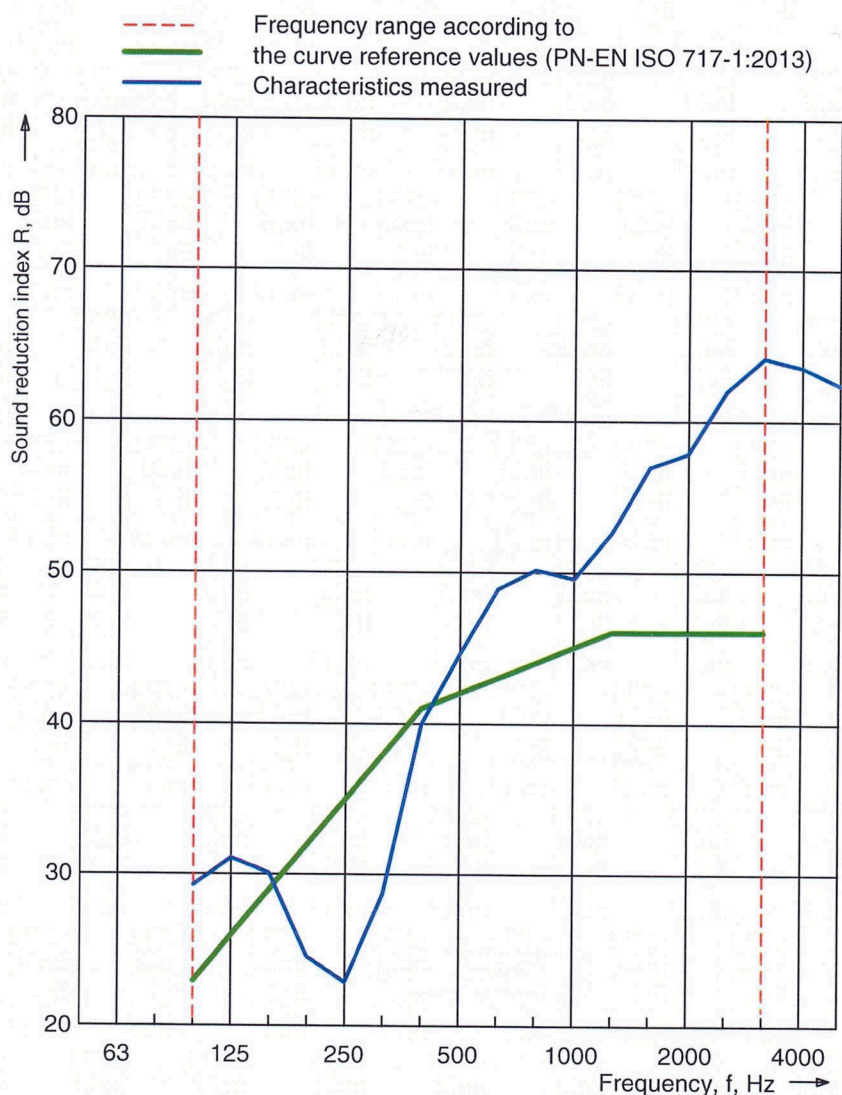
ALFADUR - 50

dimensions: 3000 1500 mm

Sample no 2/LZF00 - 01979/19/Z00NZF

Area of test specimen: **4,50 m<sup>2</sup>**  
 Mass per unit area: **--- kg/m<sup>2</sup>**  
 Test room: source receive  
 Volume, m<sup>3</sup>: **87,5 51,6**  
 Air temperature, °C: **23,7 24,1**  
 Air humidity, %: **50,3 51,4**

Frequency f [Hz]	R 1/3 octave [dB]
50	---
63	---
80	---
100	29,3
125	31,1
160	30,1
200	24,6
250	22,9
315	28,7
400	40,0
500	44,6
630	48,9
800	50,2
1000	49,6
1250	52,7
1600	57,0
2000	57,9
2500	62,0
3150	64,2
4000	63,6
5000	62,4



Rating according to PN-EN ISO 717-1:2013

 $R_w(C;C_{tr}) = 42 (-3; -7) \text{ dB}$  $C_{50-3150} = \text{--- dB}$  $C_{tr,50-3150} = \text{--- dB}$  $C_{50-5000} = \text{--- dB}$  $C_{tr,50-5000} = \text{--- dB}$  $C_{100-5000} = -2 \text{ dB}$  $C_{tr,100-5000} = -7 \text{ dB}$ Single number index and its uncertainty  $U_{95}$  determined in accordance with PN-EN ISO 12999-1:2014:  $R_w = 42,5\text{dB} \pm 0,8\text{dB}$ 

Building Research Institute Group of the Testing Laboratories  
 Thermal Physics, Acoustics and Environment Laboratory

Test No.: 478.19

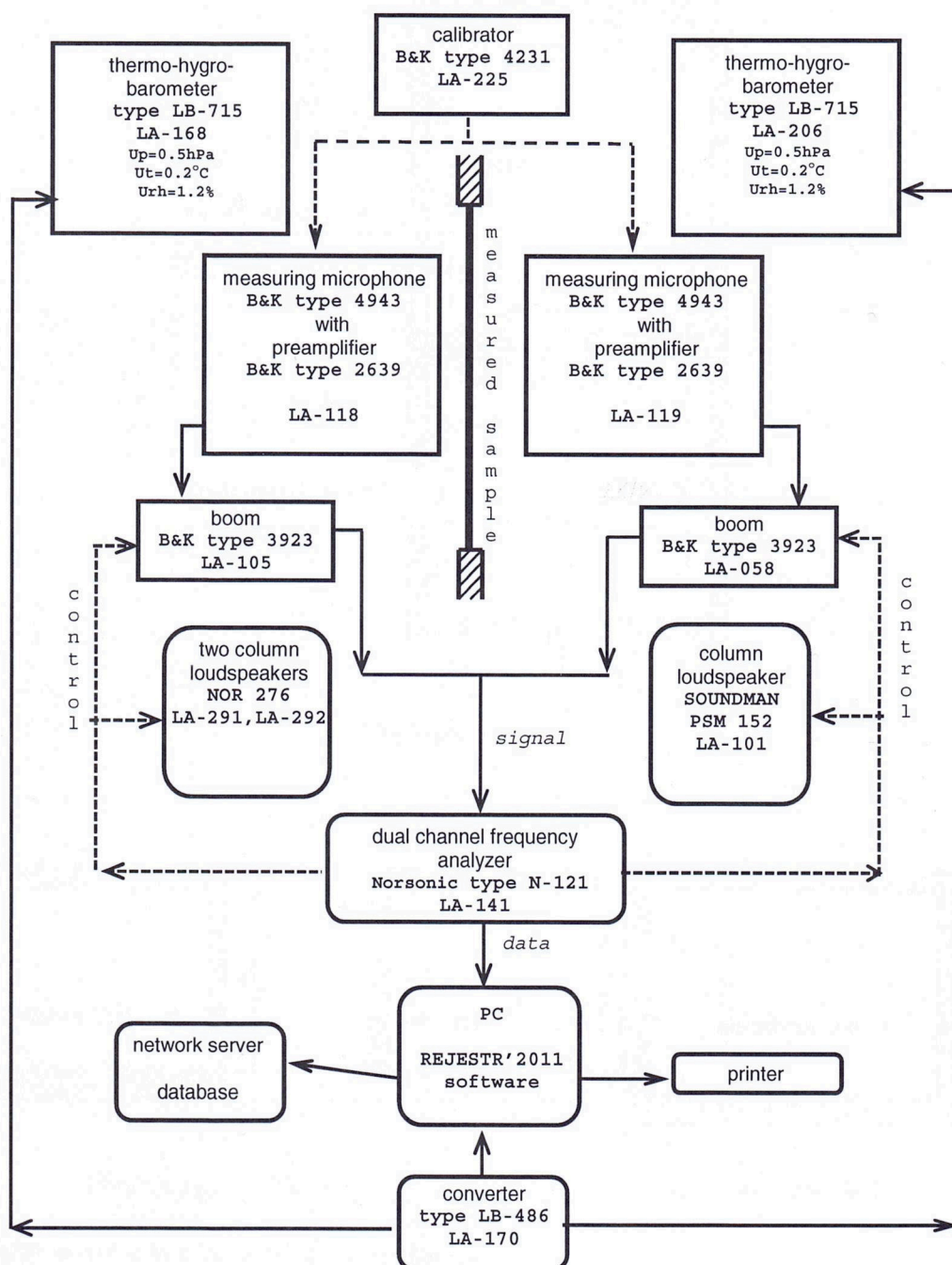
Date of analysis: 2019-07-04

Signature: Marcin Marzec

## MEASUREMENT SYSTEM FOR AIRBORNE SOUND INSULATION IN LABOLATORY

### SOURCE ROOM

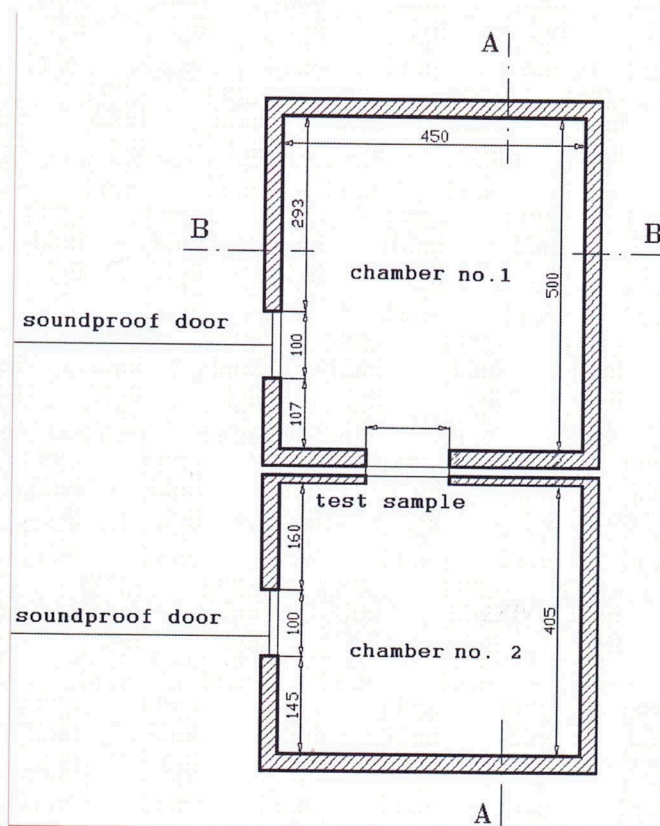
### RECEIVING ROOM



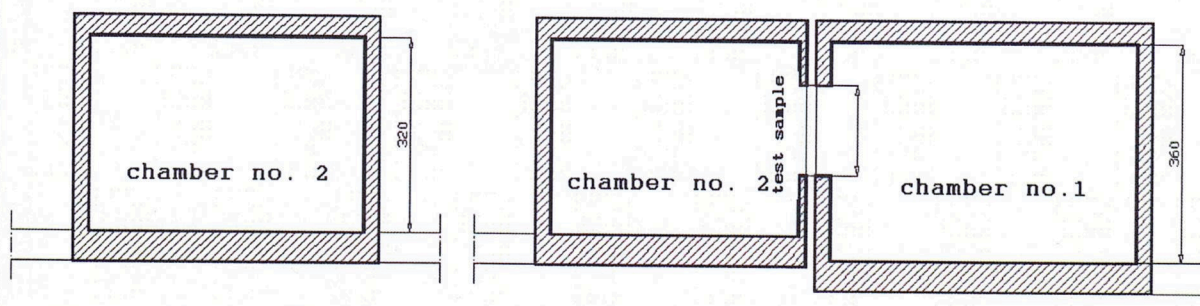
Prior to the measurement a routine calibration/inspection of the measurement line was carried out in accordance with the Instruction n° 1 entitled "Routine Calibration/Inspection of the Acoustic Measuring System".



## TEST ROOMS FOR LABORATORY AIRBORNE SOUND INSULATION MEASUREMENTS



Plan view of chambers



Vertical section B-B

Vertical section A-A

Note: All the dimensions are quoted in centimetres.

The test sample was mounted in an opening the dimensions of which were adjusted to the window size. It was mounted in a double wall of the following construction: 25-cm-thick full silicate blocks, 5-cm-thick mineral wool board (on the axis of dilatation between the test rooms), 18-cm-thick full silicate blocks.



**OTHER INFORMATIONS CONCERNING THE TEST:****Sound insulation measurement method:**

In the source room steady pink noise is emitted. It is generated by sound sources which are placed so as to obtain as diffuse as possible sound field. Sound pressure level spectrum is registered in 1/3-octave bands in the source and receiving room using rotating microphones. The average sound pressure level spectrum in the source and receiving room is obtained as a result of time and space integration of these directly measured values.

In the receiving room reverberation time  $T$  is measured, which allows to calculate a correction factor in the formula for the sound reduction index  $R$  (based on Sabine's equation:

$A = \frac{0,16 \cdot V}{T}$ ,  $V$  – volume of the receiving room). Reverberation time measurement is carried out using the interrupted noise method.

The sound reduction index  $R$  in each 1/3-octave band is calculated using the formula:

$$R = L_1 - L_2 + 10 \log \frac{S}{A} \text{ [dB]}$$

$L_1$  – the average sound pressure level per 1/3-octave band in the source room [dB] (ref. 20  $\mu\text{Pa}$ ),

$L_2$  – the average sound pressure level per 1/3-octave band in the receiving room [dB] (ref. 20  $\mu\text{Pa}$ ),

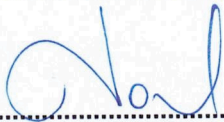
$S$  – area of the test element [ $\text{m}^2$ ],

$A$  – the equivalent sound absorption area of the receiving room [ $\text{m}^2$ ] (calculated with Sabine equation).

The weighted sound reduction index  $R_w$  and the spectrum adaptation terms  $C$  and  $C_{tr}$  have been calculated based on  $R$ , according to PN-EN ISO 717 – 1:2013 (Acoustics -- Rating of sound insulation in buildings and of building elements -- Part 1: Airborne sound insulation).

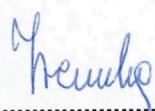
Responsible for test:

**Elżbieta Nowicka Ph.D., Eng.**

  
 .....  
 Signature

Authorizing person:

**Anna Iżewska Ph.D.**

  
 .....  
 Signature

Head of LZF laboratory:

**Agnieszka Winkler-Skalna Ph.D., Eng.**  
 Deputising for the Head of LZF laboratory

  
 .....  
 Signature

**Warsaw, 30 July 2019**

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