INSTITUTE OF ARCHITECTURE AND CONSTRUCTION OF KAUNAS UNIVERSITY OF TECHNOLOGY
BUILDING PHYSICS LABORATORY

LIETUVOS NACIONALINIS AKREDITACIJOS BIURAS

BANDYMAI ISO/IEC 17025 Nr. LA.01.031

TEST REPORT No. 220 SF/22 A en
Date: 04 of September 2022

Determination of the airborne sound reduction index

(test name)

Test method: LST EN ISO 10140-2:2021 Acoustics – Laboratory measurement of sound insulation of building elements. Part 2: Measurements of airborne sound insulation (ISO 10140-2:2021); LST EN ISO 10140-1:2021 Acoustics - Laboratory measurement of sound insulation of building elements - Part 1: Application rules for specific products (ISO 10140-1:2021); LST EN ISO 10140-4:2021 Acoustics – Laboratory measurement of sound insulation of building elements. Part 4: Measurement procedures and requirements (ISO 10140-4:2021); LST EN ISO 10140-5:2021 Acoustics – Laboratory measurement of sound insulation of building elements. Part 5: Requirements for test facilities and equipment (ISO 10140-5:2021).

(number of normative document or test method, description of test procedure)

Window description: plastic window. Dimensions: width 1230mm, height 1480mm, thickness 70 mm. Frame/Sash material: plastic. Type of opening: opening inwards, right. Glazing: 4-16Arg-4. Producer and date of the glazing unit: N/D. Date of production of window: N/D.

Product description: Air intake VentSys system consisting of two elements: outside and inside from ABS plastic. Dimensions of both elements are the same - 340x22x18mm. Outside element has filter from flexible polyurethane foam. The inside element could be open/closed.

(name, description and identification details of a specimen; information submitted by the customer)

Customer: SIA BL Investments, Tukuma nov., Lapmežciema pag., Ragaciems, Laivu iela 28, LV-3118, Latvia

(name and address)

Manufacturer:
Window: N/D
Air intake system: SIA BL Investments, Tukuma nov., Lapmežciema pag., Ragaciems, Laivu iela 28, LV-3118, Latvia

(name and address)

Test result:

Name of quantity, unit	Test method	Test result
Weighted sound reduction index with expanded uncertainty R_w dB ± U dB	LST EN ISO 717-1:2021	34.8 dB± 1.6 dB (window without ventilation grid)
		34.2 dB± 1.6 dB* (window with ventilation grid fully open)
Notes: The expanded uncertainty is calculated by multiplying the sum of the standard uncertainty by the coverage factor k = 2, which, in the case of a normal distribution, corresponds to a confidence level of 95%. The standard uncertainty is calculated according to EA-4/02. *- the result is valid with this window, if window is different it could differ		

Test place: Institute of Architecture and Construction of Kaunas University of Technology, Building Physics Laboratory
(name of the test laboratory)

Specimen delivery date: 29/09/2022 Test date: 30/09/2022 and 03/10/2022

Sampling: By customer. Specimens preparation protocol No. 220/22, 10/08/2022

Additional information: Application 10/08/2022, specimen drawing.
(any deviations, complementary tests, exceptions and any information related with particular test)

Annex: 1 - Measurement results, 2 - Drawings, 3 - Photos
(the numbers of the annexes should be pointed out)

Technical manager: (signature) J. Ramanauskas
(approves the test results) (n., surname)

Tested by: (signature) K. Miškinis
(technically responsible for testing) (n., surname)

S. P.

Test, methods and equipment

Sample has been installed (using wooden sticks) into the opening (1500×1250mm) of the dividing wall between two reverberating chambers by customer. The gap between test specimen and wall isolated with special material Perrenator. The thickness of the reverberating chamber's walls is 0,45m. The thickness of the covering masonry shell is 0,38m. The dimensions of the floor of sound chamber are 4,9x4,8m, height – 3,5÷3,0m (the coming down by steps ceiling). The dimensions of the floor of the sound receiving chamber are 4,8x4,3m, height – 3,5÷3,0m (the coming down by steps ceiling). The chamber's volumes are 80 and 68,6 m^3. The drawings of acoustic chamber is given in Annex 2. The test was performed according to the work instructions prepared in accordance with the requirements of the test method standards.

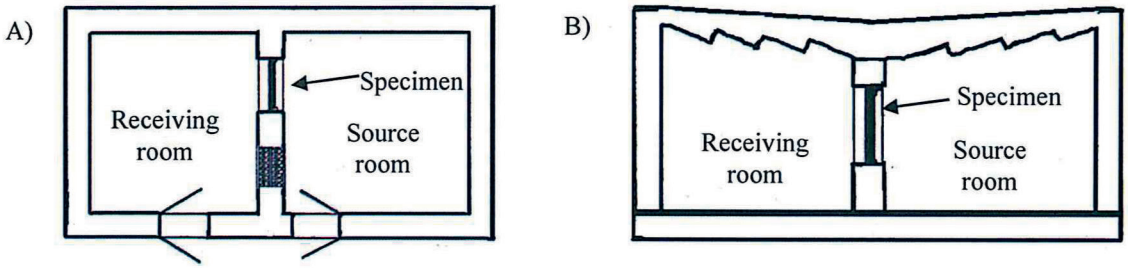


Fig. 1. Schematic view of acouctic chambers: A) Horizontal; B) Vertical

The airborne sound reduction index R was determinated in accordance with requirements of LST EN ISO 10140-1:2021 [1], LST EN ISO 10140-2:2021 [2], LST EN ISO 10140-4:2021 [3], LST EN ISO 10140-5:2021, [4]. Weighted sound reduction index Rw was determinated in accordance with requirements LST EN ISO 717-1:2021 [5]. The airborne sound reduction index has been determinate by using the precision integrated noise spectra meter, positional microphone and loudspeaker. Microphone GRAS 40 AR No.254791; Initial microphone amplifier L&D, PRM 900C No.3782; Precision integrated noise spectra meter and noise generator L&D, 2800 B No.0527; Microphone GRAS 40AR No. 254768, Initial microphone amplifier PRM900C No.3777; Calibrator of sound level LD CAL200 No.0712. Loudspeaker Norsonic 270; Microphone positioning system made to order; Relative humidity and temperature sensor Testo 615, No.40900000103Gb; Air parameter meter Delta Ohm DO 9847 No.06028078.

Sources:

[1] - LST EN ISO 10140-1:2021 Acoustics. Measurement of sound insulation in buildings and of building elements. Part 1: Application rules for specific products (ISO 10140-1:2021).
[2] - LST EN ISO 10140-2: 2021Acoustics. Measurement of sound insulation in buildings and of building elements. Part 2: Measurement of airborne sound insulation (ISO 10140-2:2021).
[3] - LST EN ISO 10140-4: 2021Acoustics. Measurement of sound insulation in buildings and of building elements. Part 4: Measurement procedures and requirements (ISO 10140-4:2021).
[4] - LST EN ISO 10140-5: 2021Acoustics. Measurement of sound insulation in buildings and of building elements. Part 5: Requirements for test facilities and equipment (ISO 10140-5:2021)
[5] - LST EN ISO 717-1:2021 Acoustics- Rating of sound insulation in buildings and of building elements. Part 1. Airborne sound insulation (ISO 717-1:2020).

Distribution of test report: Customer — Original
KTU ASI SF laboratory — Copy

Annex 1. Test results

Sound reduction index, R, in accordance with ISO 10140-2

(test name)

Test method: *LST EN ISO 10140-1:2021 , LST EN ISO 10140-2:2021, LST EN ISO 10140-4:2021, LST EN ISO 10140-5:2021*

(number of normative document or test method, description of test procedure)

Customer: SIA BL Investments, Tukuma nov., Lapmežciema pag., Ragaciems, Laivu iela 28, LV-3118, Latvia

(name and address)

Manufacturer: N/D

(name and address)

Product identification: plastic window. Dimensions: width 1230mm, height 1480mm, thickness 70 mm. Frame/Sash material: plastic. Type of opening: opening inwards, right. Glazing: 4-16Arg-4. Producer and date of the glazing unit: N/D. Date of production of window: N/D.

(identification of the product)

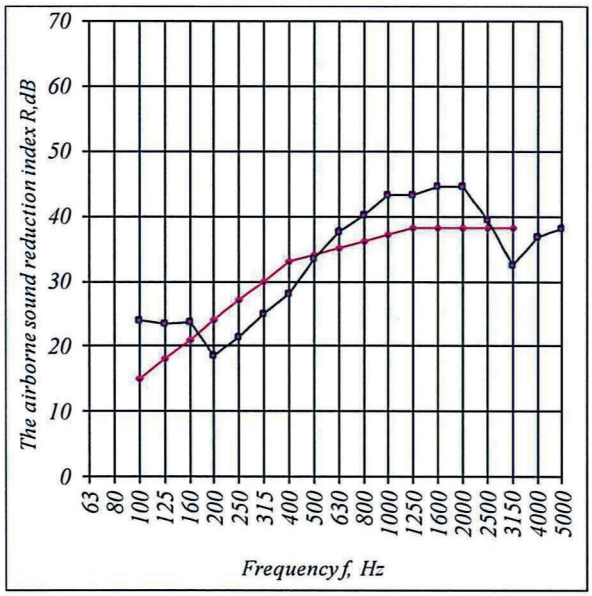
Test element mounted by: customer

Description of test facility, test element and test arrangement, including reference to ISO 10140-2:2010, where applicable:

Test room identification:	**horizontal**	**Relative humidity in the test rooms:**	50.0 %
Area, S, of the test element:	1.875 m^2	**Static pressure:**	0.1 MPa
Air temperature in the test rooms:	20.0 °C	**Receiving room volume:**	68.6 m^3
Test date:	30/09/2022		

Test place: Institute of Architecture and Construction of Kaunas University of Technology, Building Physics Laboratory

Frequency f, Hz	R, dB
100	24,0
125	23,4
160	23,8
200	18,6
250	21,5
315	24,9
400	28,2
500	33,6
630	37,7
800	40,2
1000	43,2
1250	43,3
1600	44,5
2000	44,5
2500	39,5
3150	32,5
4000	36,8
5000	38,2



Rating in accordance with LST EN ISO 717-1:2021 based on the results of laboratory measurements obtained by engineering method

$R_w(C; C_{tr})$ = 34 (-1; -4) dB; $C_{50\text{-}3150}$ = dB; $C_{tr,50\text{-}5000}$ = dB; $C_{100\text{-}5000}$ = 0 dB; $C_{tr,100\text{-}5000}$ = -4 dB

Tested by: K. Miškinis

(technically responsible for testing) (signature) (n., surname)

INSTITUTE OF ARCHITECTURE
AND CONSTRUCTION OF KAUNAS
UNIVERSITY OF TECHNOOGY
BUILDING PHYSICS LABORATORY

Annex 1. Test results

Sound reduction index, R, in accordance with ISO 10140-2

(test name)

Test method: *LST EN ISO 10140-1:2021 , LST EN ISO 10140-2:2021, LST EN ISO 10140-4:2021, LST EN ISO 10140-5:2021*

(number of normative document or test method, description of test procedure)

Customer: SIA BL Investments, Tukuma nov., Lapmežciema pag., Ragaciems, Laivu iela 28, LV-3118, Latvia

(name and address)

Manufacturer: Window - N/D;
SIA BL Investments, Tukuma nov., Lapmežciema pag., Ragaciems, Laivu iela 28, LV-3118, Latvia

(name and address)

Product identification: plastic window. Dimensions: width 1230mm, height 1480mm, thickness 70 mm. Frame/Sash material: plastic. Type of opening: opening inwards, right. Glazing: 4-16Arg-4. Producer and date of the glazing unit: N/D. Date of production of window: N/D. Air intake VentSys system consisting of two elements: outside and inside from ABS plastic. Dimensions of both elements are the same - 340x22x18mm. Outside element has filter from flexible polyurethane foam. The inside element could be open/closed.

(identification of the product)

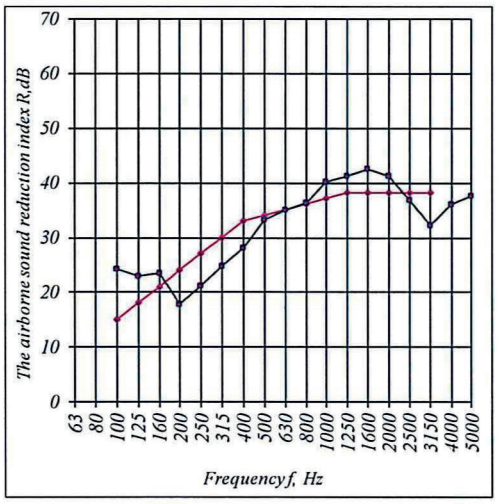
Test element mounted by: customer

Description of test facility, test element and test arrangement, including reference to ISO 10140-2:2010, where applicable:

Test room identification:	**horizontal**	**Relative humidity in the test rooms:**	50.0 %
Area, S, of the test element:	1.875 m^2	**Static pressure:**	0.1 MPa
Air temperature in the test rooms:	20.0 °C	**Receiving room volume:**	68.6 m^3
Test date:	03/10/2022		

Test place: Institute of Architecture and Construction of Kaunas University of Technology, Building Physics Laboratory

Frequency f, Hz	R, dB
100	24,2
125	22,9
160	23,4
200	17,7
250	21,1
315	24,7
400	28,2
500	33,2
630	35,1
800	36,3
1000	40,1
1250	41,3
1600	42,4
2000	41,3
2500	36,8
3150	32,1
4000	36,0
5000	37,5



Rating in accordance with LST EN ISO 717-1:2021 based on the results of laboratory measurements obtained by engineering method

$R_w(C; C_{tr})$ = 34 (-2; -5) dB; $C_{50\text{-}3150}$ = dB; $C_{tr,50\text{-}5000}$ = dB; $C_{100\text{-}5000}$ = -1 dB; $C_{tr,100\text{-}5000}$ = -5 dB

Tested by: K. Miškinis

(technically responsible for testing) (signature) (n., surname)

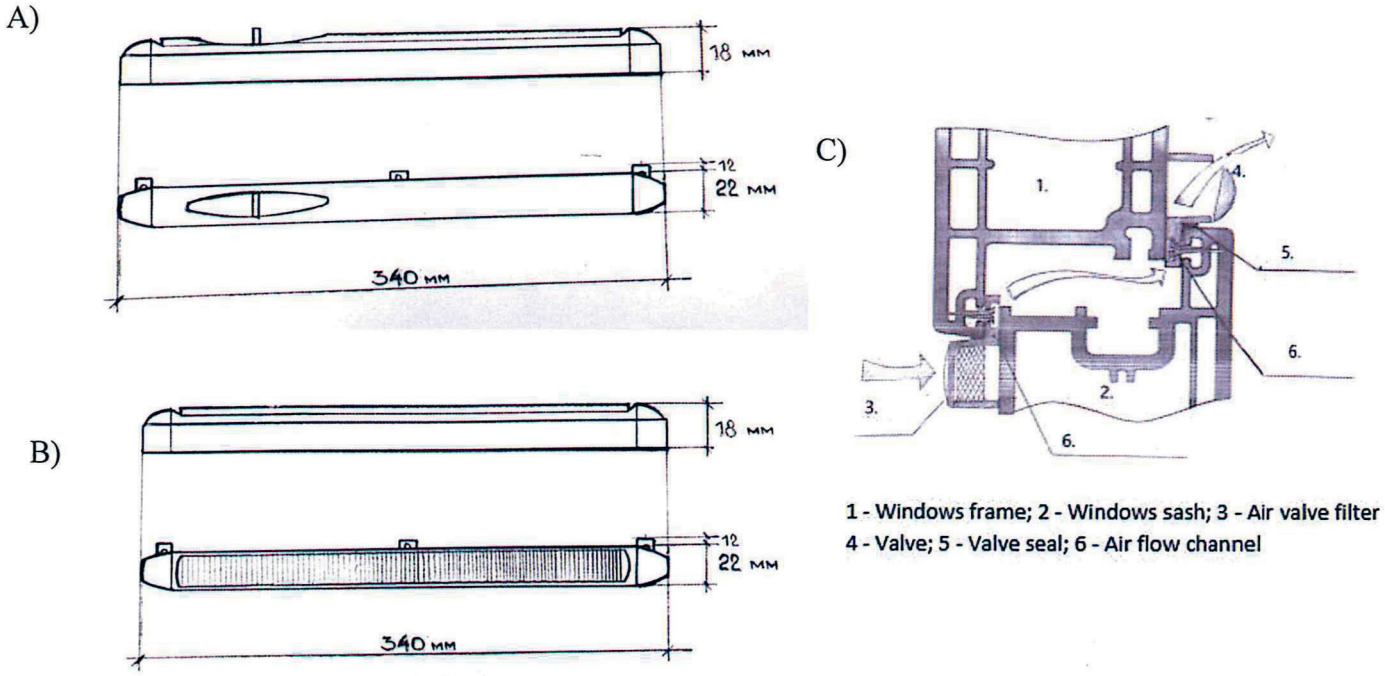


Fig. 2. Drawings. A) inside element; B) outside element; C) Air intake VentSys system principal scheme (information submitted by the customer)

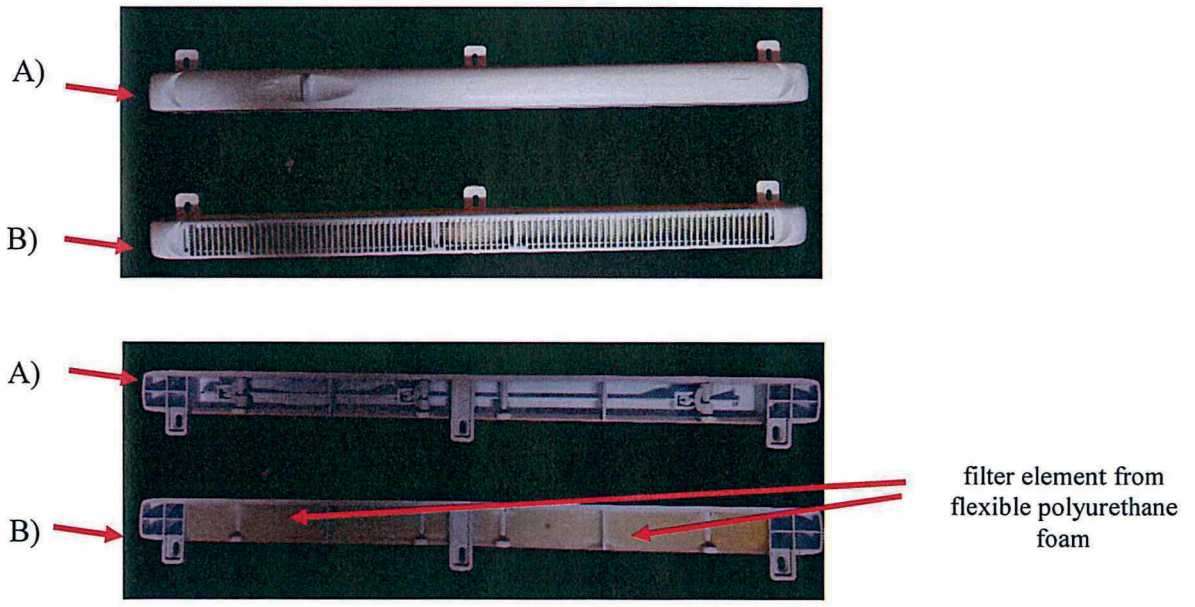
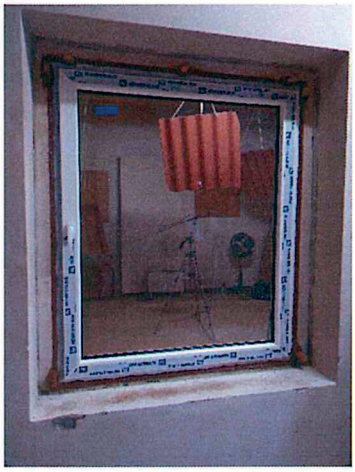


Fig. 3. Air intake system elements. A) outside; B) inside.

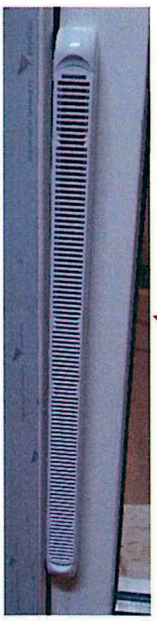


From receiving room side

From source room side

Fig. 4a. Photos of window without air intake system made during the test

From receiving room side



From source room side

Fig. 4b. Photos of window with air intake system made during the test