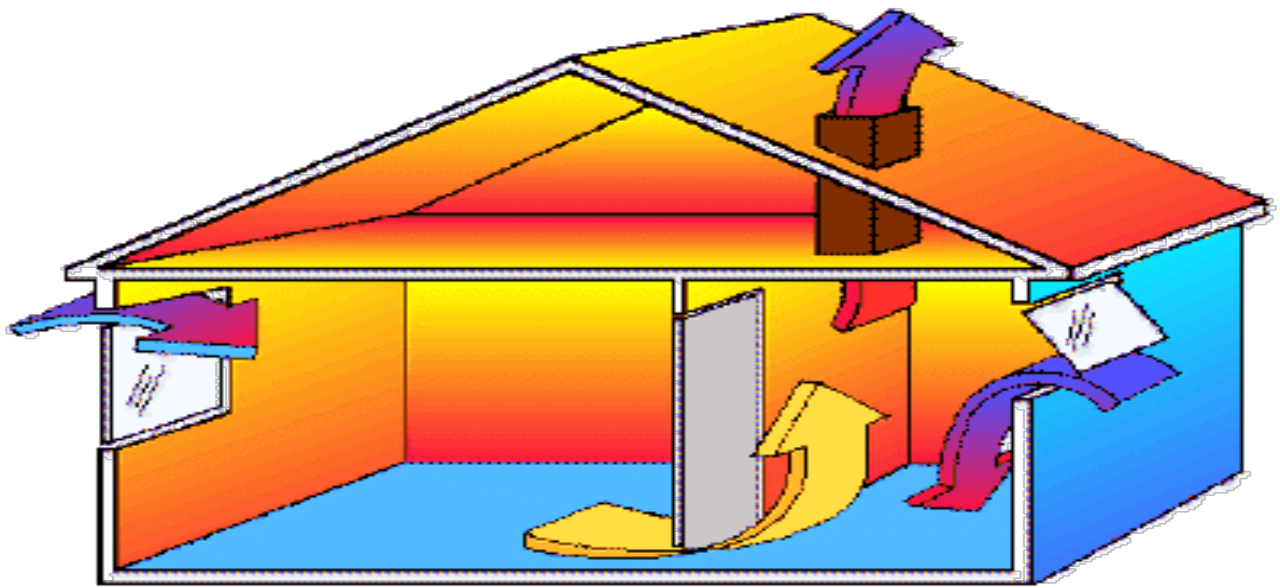
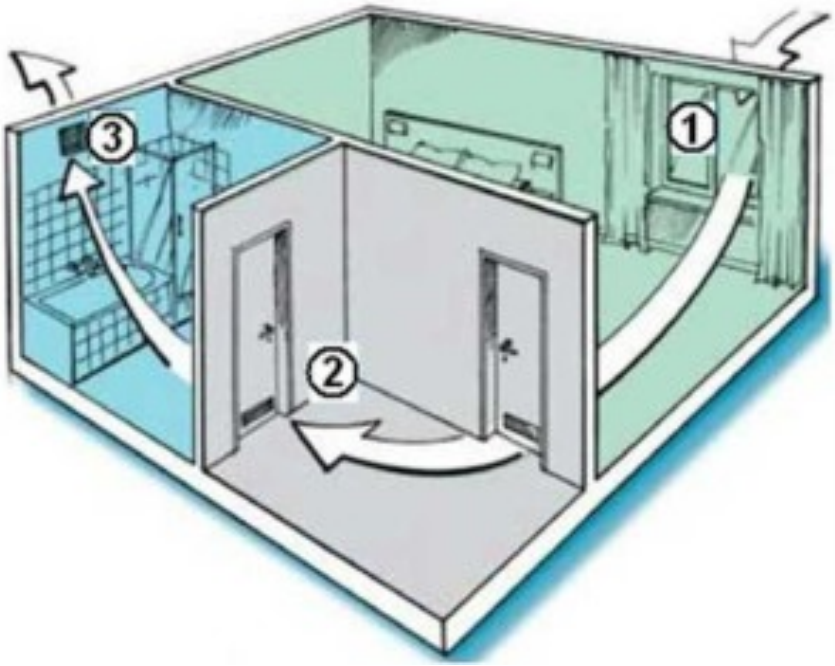
energoefektīvākā ēka Latvijā 2023

Ventilation and Windows – Before and after Building renovation



The replacement of windows in buildings where natural ventilation was intended in the projects – has the most direct impact on the building and human health!



New Windows!

Benefits?

Issues?

Benefits

PROBLĒMAS

In the late 20th century, around the end of the 1950s when the first dense windows appeared in buildings, a new term emerged (sick Building Syndrome), indicating the development of building construction and the formation of a toxic indoor microclimate.
In 1989, after the fall of the Berlin Wall, massive building renovation process began in East Germany…. It was the beginning without experience…

Alte Häuser „kaputtsaniert“

Denkmalpfleger und Restauratoren äußern scharfe Kritik

Göttingen (dpa/lni) Zehntausende der 2,3 Millionen Fachwerkhäuser in Deutschland sind in den vergangenen Jahren durch falsche Baumaterialien und Renovierungstechniken „kaputtsaniert“ worden.

(Kreis Göttingen) Landesdenkmalpfleger und Restauratoren. „Wir haben Häuser gesehen, die hatten 300 Jahre keinen Schaden, und jetzt, nach der angeblichen Grundsanierung, brechen sie zusammen. Die tragenden Balken verfaulen. Im

ner Klopfer (Fulda). Die Bauschäden entstünden durch falsche Außenanstriche, zu dichte Fenster, Wandaufbauten, die keinen Wasserdampf durchließen oder falsche Isoliermaßnahmen.

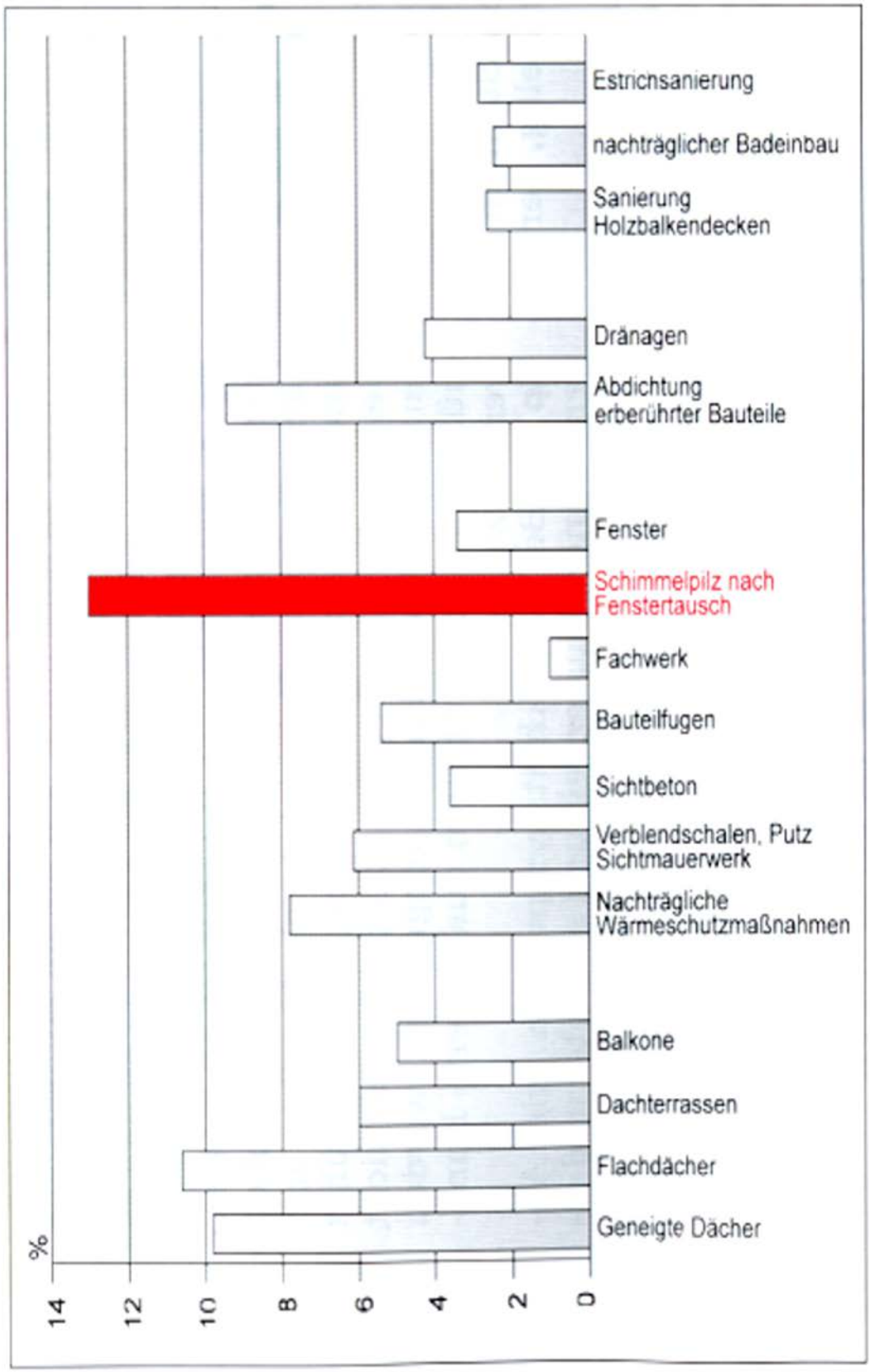
Viele Bauherren stellten

Eltern: Schimmelpilz macht Tochter krank

Arzt: Wohnung sanieren - Eigner: Besser lüften

Schimmelpilz macht krank

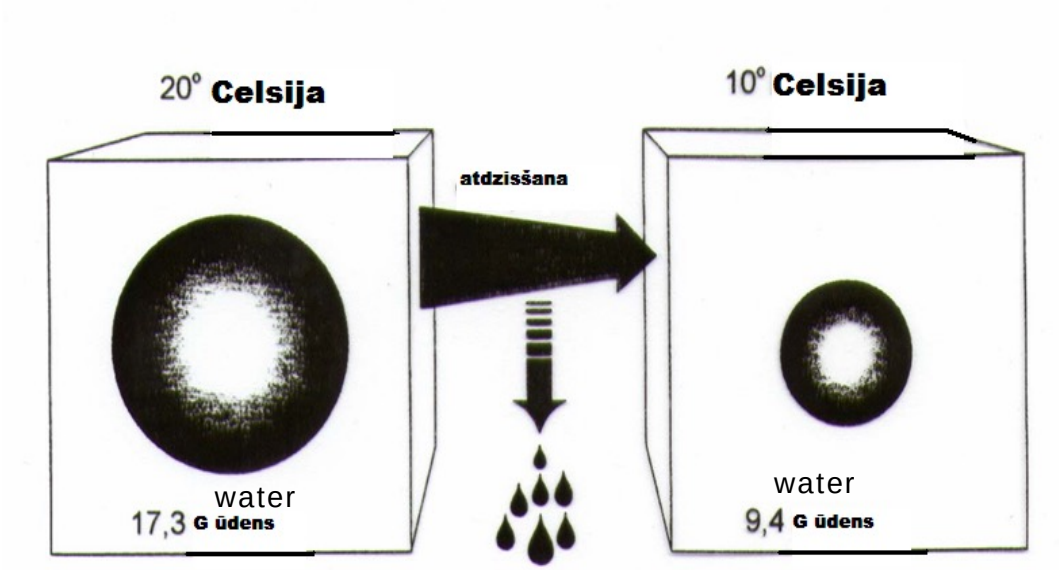
Wenn sich in Wohnungen die Sporen verbreiten


Estrichsanierung
nachträglicher Badeinbau
Sanierung Holzbalkendecken
Dränagen
Abdichtung erberührter Bauteile
Fenster
Schimmelpilz nach Fenstertausch
Fachwerk
Bauteilfugen
Sichtbeton
Verblendschalen, Putz Sichtmauerwerk
Nachträgliche Wärmeschutzmaßnahmen
Balkone
Dachterrassen
Flachdächer
Geneigte Dächer
%
14
12
10
8
6
4
2
0

Consequences – If there is no air exchanged in rooms

Consequences – If there is no air exchanged in rooms

Condensation formation



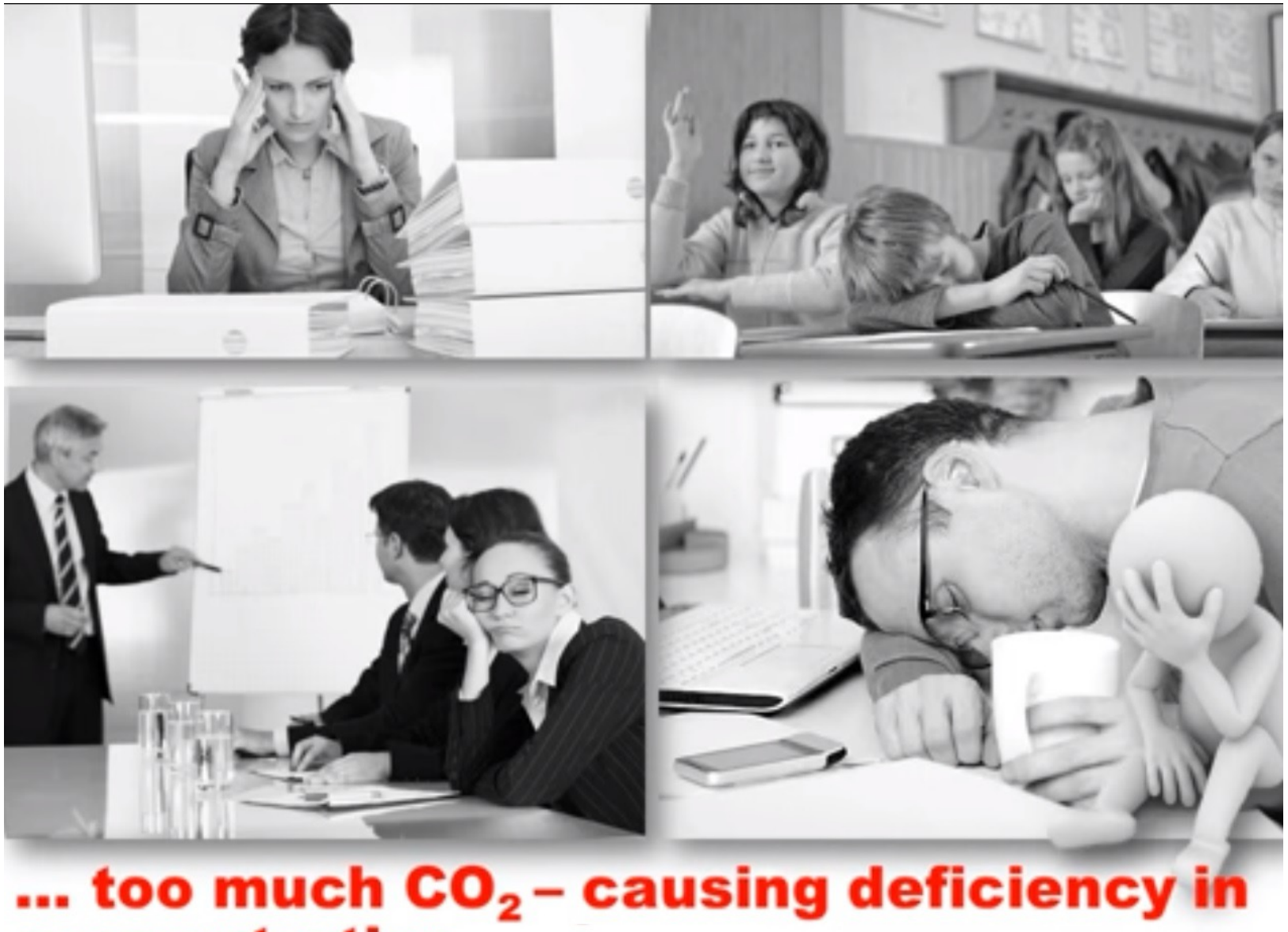
Temperature C°	Mitruma Saturation g/м^3
-10	2,14
0	4,8
10	9,4
20	17,3
30	30,3

Condensation occurs when air, upon cooling, cannot retain the same amount of water vapor within it

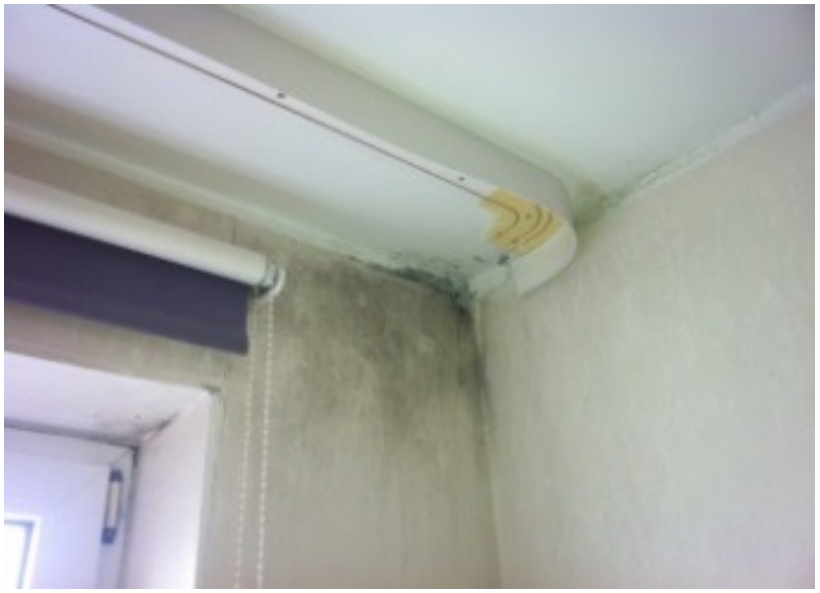
«Dew point» Formation

Air Temperature °C	Relative humidity%										
	45 %	50 %	55 %	60 %	65 %	70 %	75 %	80 %	85 %	90 %	95 %
25	12,2	13,9	15,3	16,7	18,0	19,1	20,3	21,3	22,3	23,2	24,1
24	11,3	12,9	14,4	15,8	17,0	18,2	19,3	20,3	21,3	22,3	23,1
23	10,4	12,0	13,5	14,8	16,1	17,2	18,3	19,4	20,3	21,3	22,1
22	9,5	11,1	12,5	13,9	15,1	16,3	17,4	18,4	19,4	20,3	21,1
21	8,6	10,2	11,6	12,9	14,2	15,3	16,4	17,4	18,4	19,3	20,2
20	7,7	9,3	10,7	12,0	13,2	14,4	15,4	16,4	17,4	18,3	19,2
19	6,8	8,3	9,8	11,1	12,3	13,4	14,5	15,3	16,4	17,3	18,2
18	5,9	7,4	8,8	10,1	11,3	12,5	13,5	14,5	15,4	16,3	17,2
17	5,0	6,5	7,9	9,2	10,4	11,5	12,5	13,5	14,5	15,3	16,2
16	4,1	5,6	7,0	8,2	9,4	10,5	11,6	12,6	13,5	14,4	15,2
15	3,2	4,7	6,1	7,3	8,5	9,6	10,6	11,6	12,5	13,4	14,2
14	2,3	3,7	5,1	6,4	7,5	8,6	9,6	10,6	11,5	12,4	13,2

Issues !

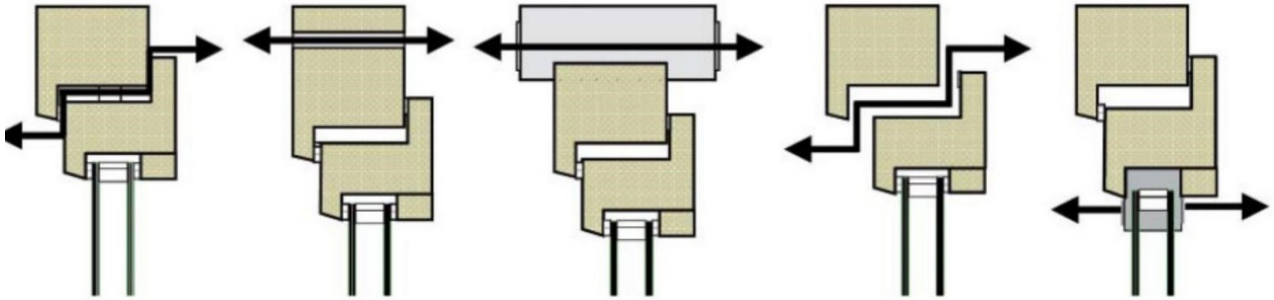


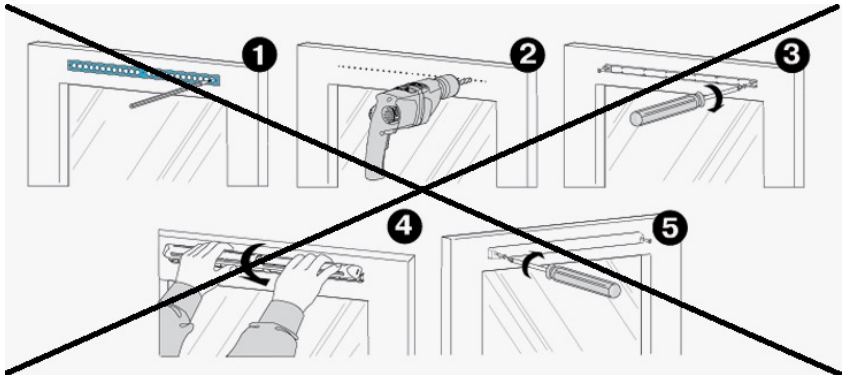
Closed Window!



Opened Window!

Schematic examples of air supply to windows





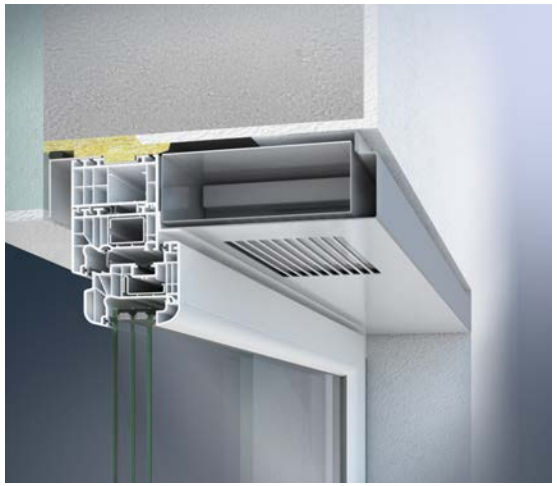
!!! It is not recommended to drill or mill air chambers that serve as thermal insulation in PVC window frames!!

- **Regulations on Latvian Building Standard LBN 231-15** ‘’Heating and Ventilation of Residential and Public Buildings’’
- *Issued in accordance with Construction Law Article 5, Point 3.*

3.2.3. Efficiency of Ventilation systems

97. If the only source of indoor air pollution is people, the absolute minimum for fresh air supply is 15 m^3/h per person.

Examples – Air intake through windows



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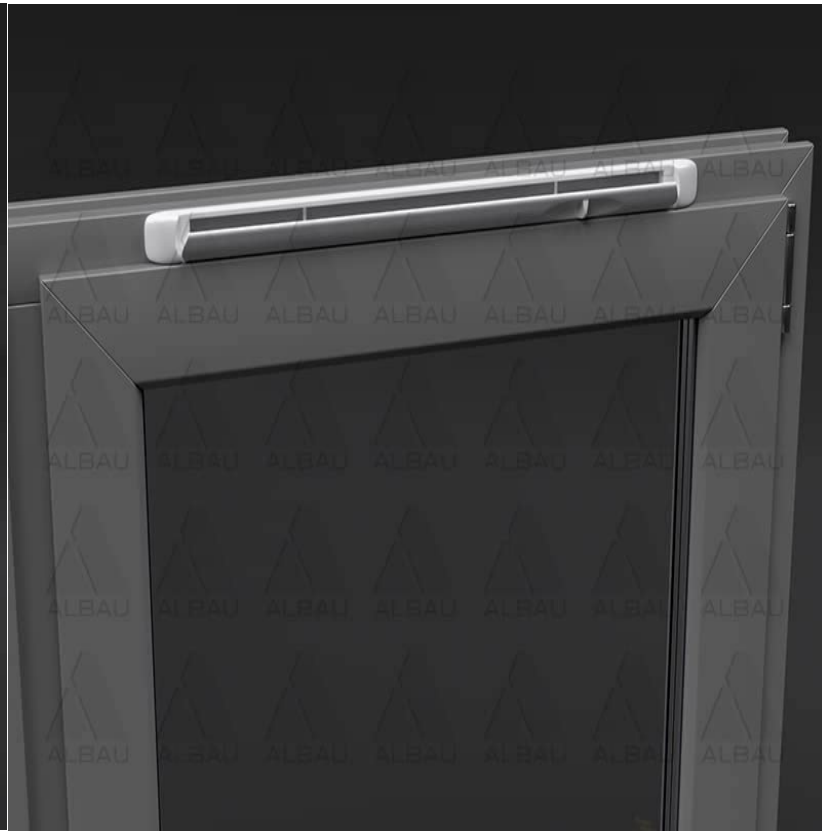
Possibly the best solution



*Suitable for all type of opening windows, PVC, Wood and Aluminum

*Simple installation to already installed windows, without mechanically damaging the window frames

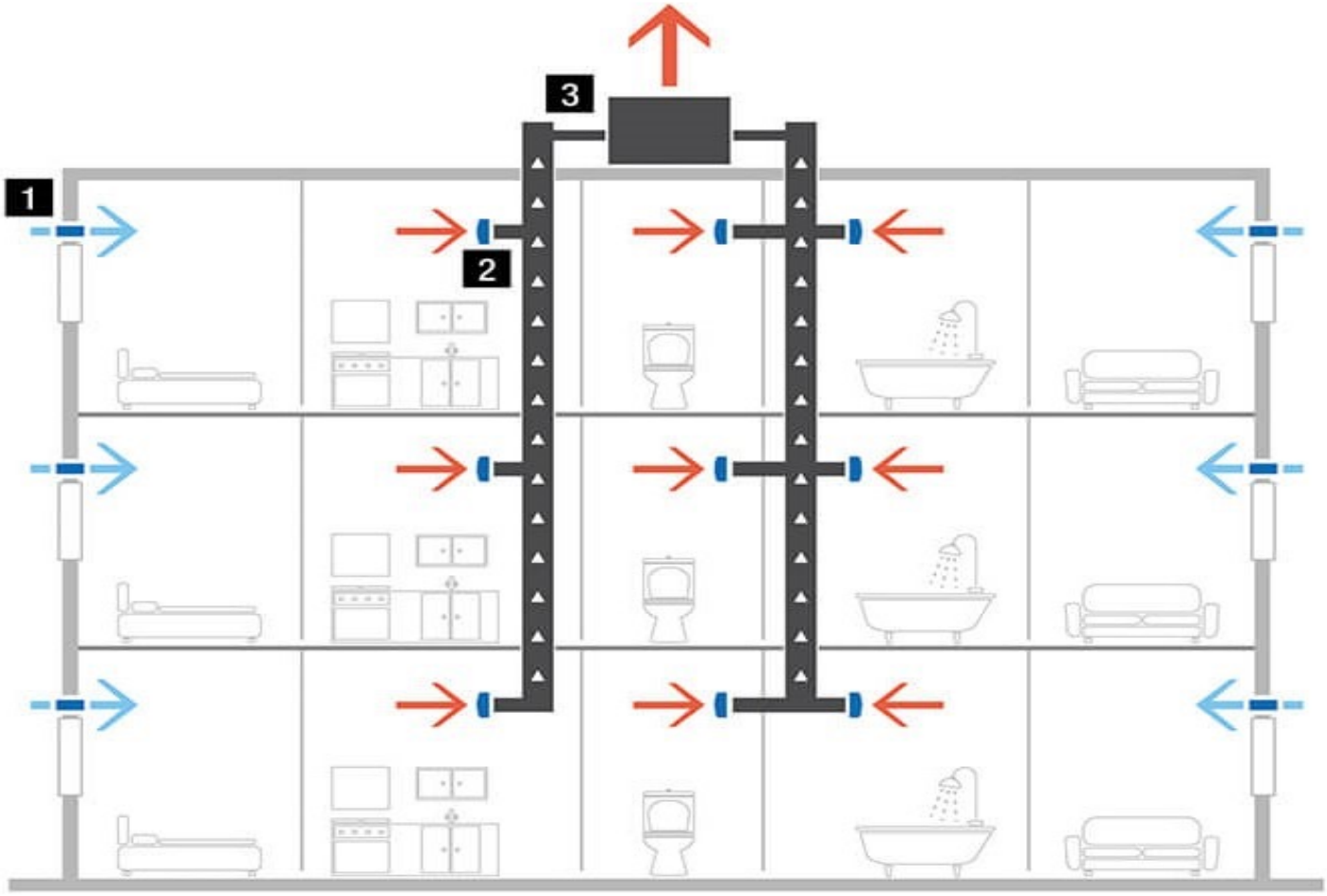
*Equipped with an easy-to-reach and replaceable filter

Example – Air intake through windows

- *Easy to install already installed windows.*
- *Manually possible to regulate airflow and close it*
- *Equipped with easy exchangeable filters*
- *Air permeability* ***41 м^3/h***
- ***Tested to sound isolation***
- ***Made in Latvia***

In collaboration with the Scientific Center ‘’Kleisti’’ of Rīgas Stradiņa University, which also researches indoor microclimate, air exchange was tested in several renovated buildings in the city of Valka

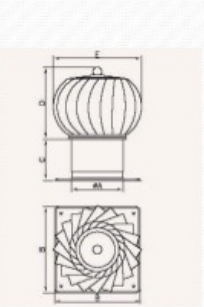
The most common example of natural ventilation supply and exhaust



Enhancement of air exhaust in buildings with natural ventilation

One of the most popular examples of natural ventilation supply and exhaust in Latvia

Reinforcement of the hood of ventilation with rotary deflectors to improve air exhaust



Enhancement of air exhaust without electrical connection

energoefektīvākā
ēka Latvijā
2022

The most energy-efficient renovated multi-apartment building in 2023: Rīgas Street 6a, Valka.

www.energoefektivakaeka.lv

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

Page (pages) 1 (6)

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: N Okkaoglu, Tavsanli Fatih Mahallesi, Selcuk Ergin Cad. No:10-2, Altinova, Yalova, Turkey

(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)

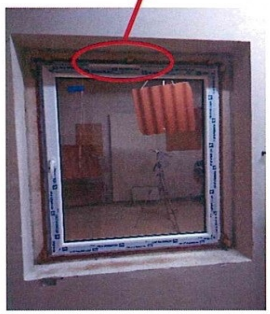
Annex: 1 - Measurement results, 2 - Drawings, 3 - Photos
(the numbers of the annexes should be pointed out)

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

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

S. P.

Tunelio str. 60, LT-44405 Kaunas, Lithuania tel. +370 37 350799,
Web site: www.ktu.edu/asi/en/ ; E.mail: statybine.fizika@ktu.lt



ekšpuse (vārsts vērtnes aukšdaļā)

Loga ārpuse (filtrs lejas daļā)

VentSys provides possibility the best sound insulation in its class, as evidenced by results from accredited laboratories!



Healthy Microclimate
Energy efficiency
Ecology
Comfort

Thank you for Attention!

Ivars Buls