

Sound-absorbing HAFENCITY windows from Eilenburg



Effective solutions
for soundproofing for
partially open windows



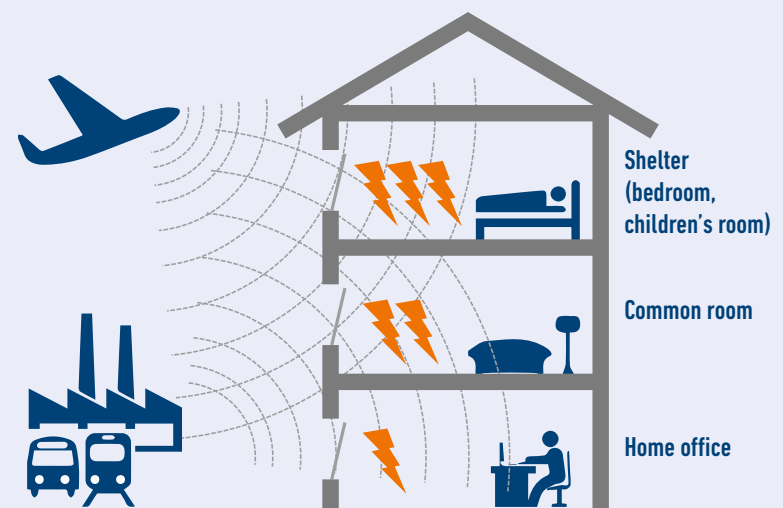
Noise protection
Air exchange
Living comfort





Constantly increasing loud noise and disturbances are a problem in our modern society. Especially in metropolises the life of many people is strongly affected by traffic, industry and neighbourhood noise. At the same time our cities are even more densely cultivated also in already heavily noise-polluted areas. Regular intense noise leads to sleep deprivation, concentration difficulties and may have an impact on health, well-being and quality of life of residents.

Noise protection = Health protection



Windows play a significant role in passive sound insulation

- » At closed buildings, passive sound insulation against outside noise is technically possible.
- » BUT: approx. 80% of all Germans feel seriously annoyed if they need to keep windows closed because of external noise pollution (lack of fresh air, resp. isolation)

» Windows are the biggest challenge for passive sound insulation

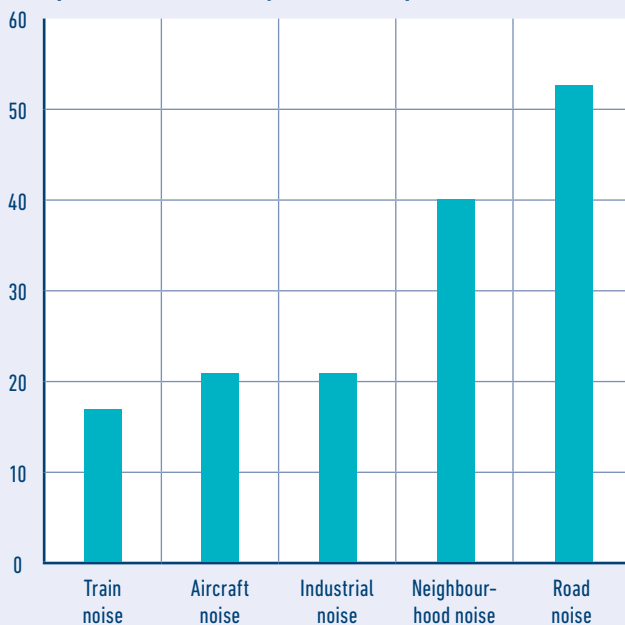


Economic damage. More than 50% of the German population, for example, feel annoyed by road noise.

The economic costs and direct impact caused by noise are already very high and without any countermeasures will still increase in the future. The consequences will be a lower quality of life and hardly any creation of new housing in urban environments. Negative effects could also be physical illness, insomnia and depression. That is why since many years jurisdictions all over the EU demand an “appropriate satisfaction of housing needs” as protection of residents – even when the windows are tilted.

That is why we are working on the subject noise protection with partially open windows for many years. We developed innovative solutions which guarantee highest sound protection and still supply natural fresh air. This way building permits for badly needed living space can be granted even at unfavourable noise-sensitive locations, for which so far no sufficient insulation measures have been available.

Noise pollution in Germany as an example (in %)



source: German Umweltbundesamt 2015

Consequences:

- » Refusal of building permissions near industry / traffic (densification)
- » Increasing housing shortage and rising construction costs due to noise-polluted environments
- » Habitants move to more quiet areas
- » Depreciation and quality degeneration of buildings and properties exposed to noise
- » In the long term, well-being, communication and physical health could be harmed durably
- » Noise-polluted residential locations become poor and orphaned

» Noise = a constant conflict with negative effects!



Jurisdiction all over the EU call for sound insulation with tilted windows

» Health protection is of great importance to the European Union and that is why there are already many laws which demand fresh air supply PLUS a low noise level especially in protected areas (bedroom, kids room). «

BVerwG, Urteil vom 21.09.2006 Az. 4 C 4/05

» The administrative court in Munich, for example, demands in a judicial decision that soundproof windows have to allow at least a tilted position in bedrooms at night. «

VHG Munich, Dec. 2, 2018, Az. 15 ZB 08.1328

» Planning regulations regularly stipulate that an interior level of 30 dB (A) must not be exceeded when the window is tilted“. «

e.g.: development plan for Hamburg, Altstadt / HafenCity 1 §2

Innovation of Eilenburger Fenstertechnik: 46 dB tilted / partially open

Universal model

Soundproof windows made in Eilenburg are specially designed box-type windows with noise protection glazing which are available in several versions. The principle is based on two window planes that can be opened offset. Depending on the design, the partially tilted casements are set off vertically or, if necessary, also horizontally.

Air passage / h

Our sound-absorbing HAFENCITY windows are passively ventilated windows. They can be tilted 4 cm, so that a large geometric ventilation cross section is created. The airflow inside the elements is constructed in such a way that no relevant reduction in fresh air supply occurs. Air volume flow measurements on a standard window, for example, have yielded values of more than 1000 m³/h.

Thermal insulation properties

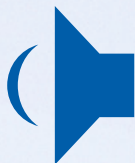
When closed, the soundproof HAFENCITY window has the same excellent heat transition effect as the underlying box-type window (depending on facilities). As the HAFENCITY window "in operating mode" is an open window, there are no specific information concerning effective thermal insulation properties. The desired air exchange naturally leads to a cooling of the room.

Which wall thickness is necessary?

The building depth for box-type windows are usually 24 cm. Wall thicknesses of 24 to 36.5 cm are perfect.

70 m³/h

air volume
at 10 Pa



< 30 dB

noise level inside

46 dB

sound reduction
index, tilted



76 dB

noise level outside





Highlights:

- » Effective soundproofing
AND natural ventilation
- » Principle box-type window with specially integrated sound absorbers
- » Offset tilted position – principle deflection sound absorber
- » Legally protected utility model
- » Opening of all window sashes is possible up to 90°
- » Parapet height possible as safety barrier

6/7

Advantages:

- | | |
|---|---|
| » Natural, healthy fresh air exchange | » No feeling of isolation / acoustic encapsulation |
| » Comfort and peace even with tilted window | » No inherent noise |
| » Individual solution according to your needs | » No power consumption |
| » For new buildings as well as for reconstruction | » Well distributed fresh air |
| » Design in plastic or aluminum | » Suitable for escape routes |
| » Façade hardly affected visually | » Familiar handling |
| » Simple and safe installation | » Usual cleaning and care |
| » Low susceptibility, tested elements | » Increased protection against burglary |
| » Prevention of mould | » Excellent thermal insulation
(U_w up to $0.4 \text{ W/m}^2\text{K}$ possible) |
| | » Common building depth 24 cm |

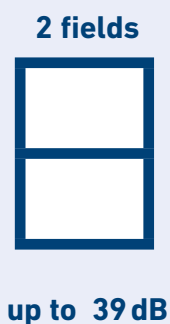
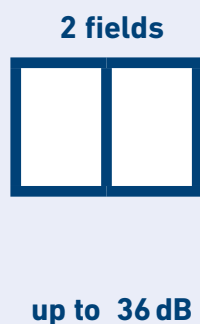
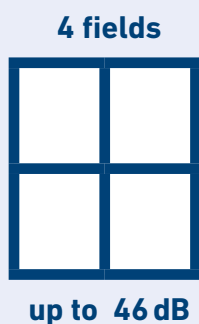
HAFENCITY window outperforms existing solutions

Are there any test certificates available?

For certain window types test certificates are available. The achievable sound insulation values depend on the window's construction type, its dimensions, functional design and mounting conditions. If your construction dimensions deviate sharply from our those of our tested windows, we recommend an individual test bench measurement to determine the exact soundproofing values.

For more information please visit our website:
www.hafencity-fenster.de/english





Qualitative assessment of highly effective soundproofing solutions for windows

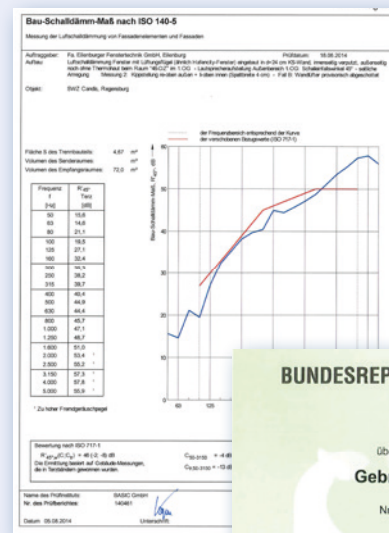
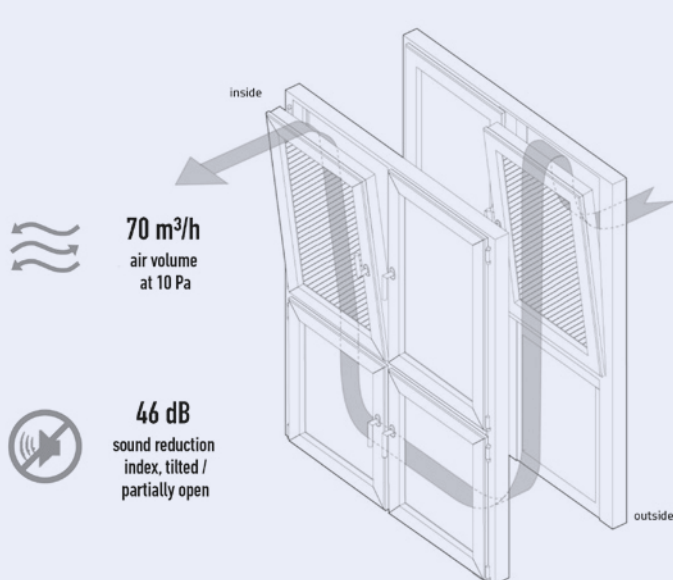
	Sound-absorbing HAFENCITY window from Eilenburger Fenstertechnik	Soundproof window with outlet ventilator	Soundproof window and active ventilation device
Approval	+ planning requirements easily fulfilled	– Planning requirements often not fulfilled	– Planning requirements often not fulfilled
Assembly	+ assembly as normal box-type window	+ assembly as normal window – wall breakthrough might be necessary	– additional wall opening required – installation of power supply – high installation costs
Usage	+ high acoustic insulation with tilted window + high rate of air exchange + easy handling	– permanent ventilation or unusual airing regulation – low air exchange – tilted window: noise	– inherent noise > 30 dB – unfamiliar ventilation flap – power consumption – maintenance and service – tilted window: noise
	Innovation	Limited acceptance	

Sound-absorbing HAFENCITY windows from Eilenburg with 4 fields and 2 fields

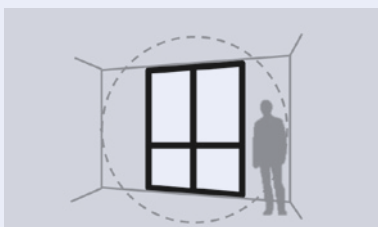
THE solution for maximum soundproofing

Our construction type with 4 fields allows for a variety of architectural design options. Bright rooms flooded with light, if required increased protection against burglary and usability as second emergency escape route give residents a feeling of comfort and modern well-being. Furthermore, with **up to 46 dB** we achieve maximum soundproofing comfort plus natural fresh air supply thanks to partially open windows. All that without background noise and costs for additional ventilators.

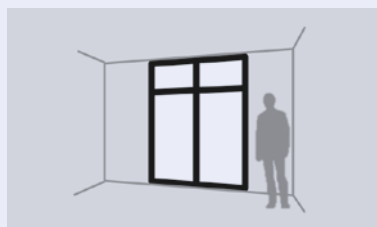
4 fields: THE solution for maximum soundproofing



Room-high with parapet field



Room-high as balcony door



Design dimensions approx. 1500...2200 x 2000...2600

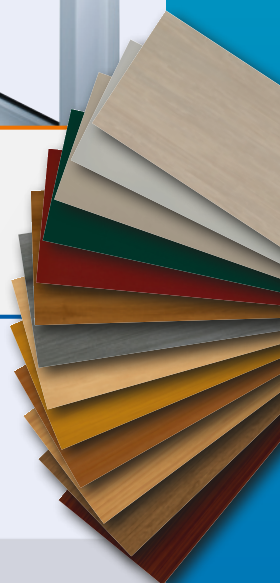




Special solutions

For the high air and acoustic requirements we also have other partially open special solutions in addition to our well-established HAFENCITY windows.

- » baffle pane
- » ventilation element



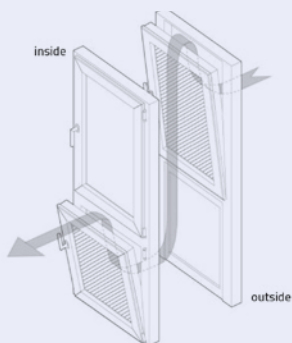
2 fields: high sound insulation, strong ventilation



120–70 m³/h
air volume at 10 Pa



35–39 dB
sound reduction index,
tilted / partially open



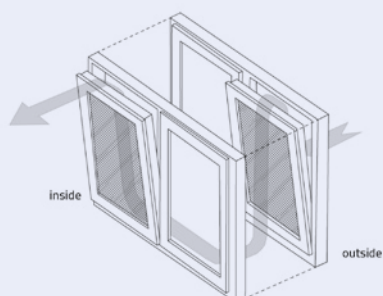
Design dimensions approx. 650...1200 x 2000...2600



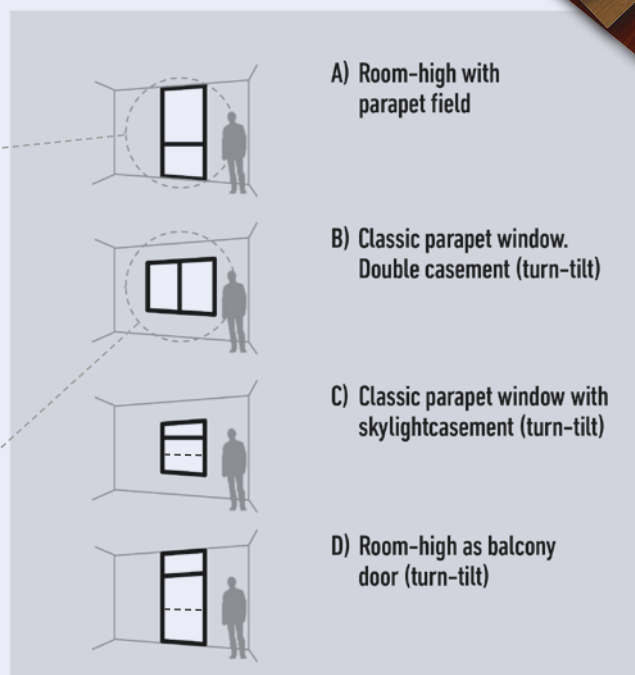
70 m³/h
air volume at 10 Pa



36 dB
sound reduction index,
tilted / partially open



Design dimensions approx. 1500...2200 x 1500...2400



» More soundproofing HAFENCITY window models are under development

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