

UNIGLAS®
IT'S CLEAR

UNIGLAS® | PHON
Sound reduction glass





Noise gets on your nerves and leads to stress.

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Noise in everyday life

Life is getting louder and louder. Especially in city centres, people are affected by noise from street, rail and air traffic, as well as from restaurants and nightclubs.

But there are also numerous sources of noise in the countryside: farm machinery reaping the harvest, the neighbour lovingly mowing his lawn at the weekend or motorcyclists enjoying the winding country roads on a Sunday.

Noise gets on your nerves and leads to stress.

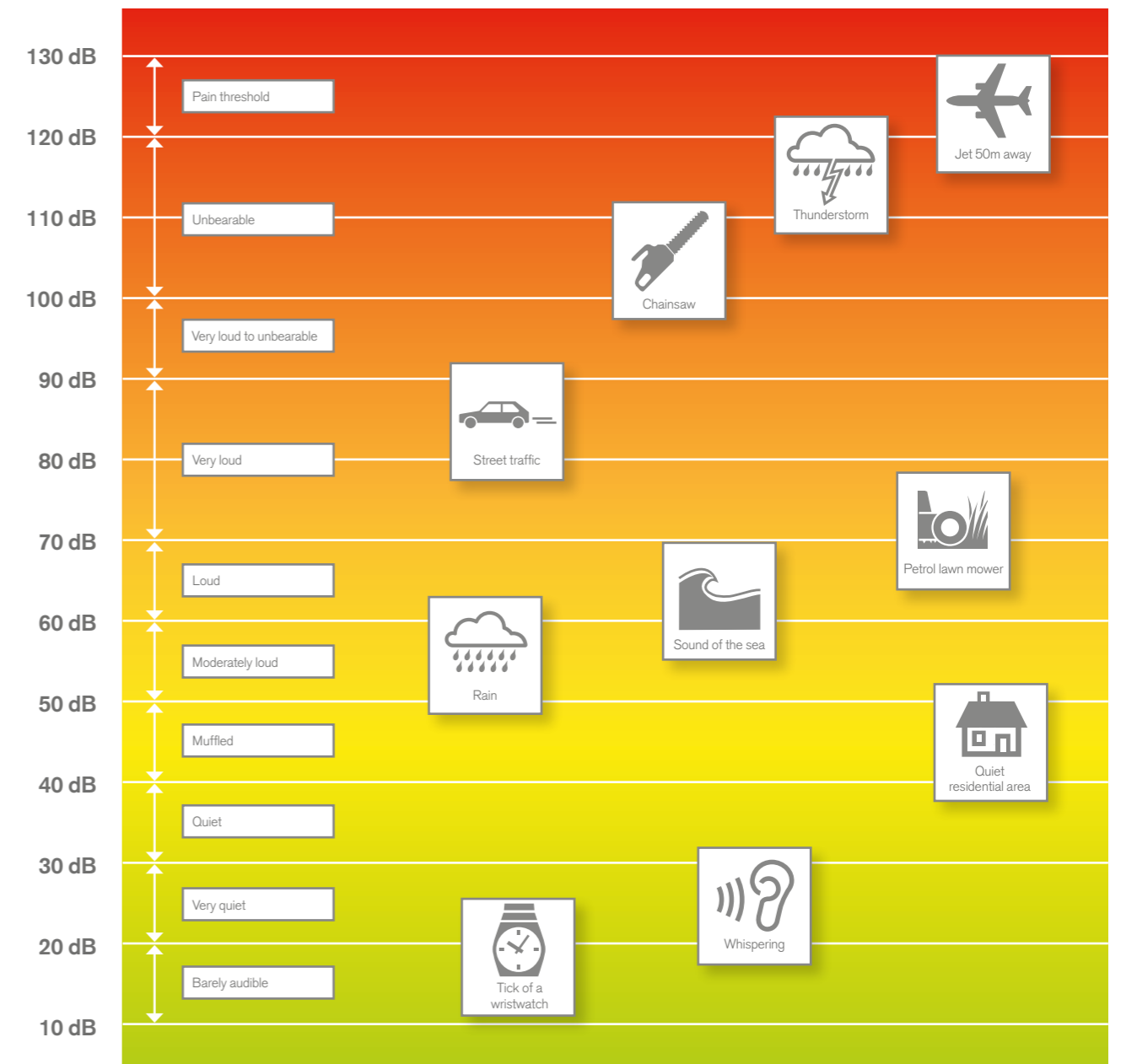
Effects of noise

Noise does not have a smell or a taste and we only feel pain when the volume reaches our ears. The volume of a sound can be described as a physical value:

The sound pressure, measured in decibel (dB). Sound measuring from 55 dB is already classed as noise pollution which affects performance and well-being. Sound measuring 65 to 75 dB causes physical stress which can lead to high blood pressure and cardiovascular disease.

UNIGLAS® “Noise barometer”

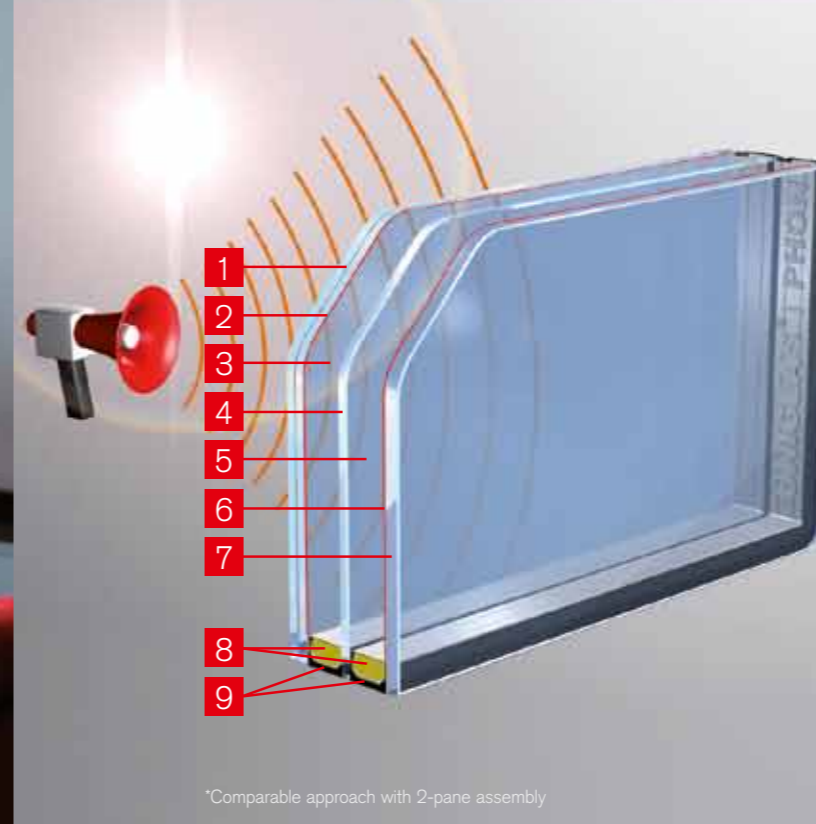
How loud is “loud”? The UNIGLAS® “Noise barometer” shows you what effect the volume of everyday noises has on our senses.



dB = decibel



Many people are inevitably exposed to noise. Both during the day and at night, noise can chip away at your health. Time to react!



Example 3-pane assembly*

1. Laminate shatter-proof glass with sound proof film
2. Precious metal coating
3. Space between panes with inert gas filling
4. Float glass pane
5. Space between panes with inert gas filling
6. Precious metal coating
7. Float glass pane
8. Spacer with drying agent
9. Double edge sealant

*Comparable approach with 2-pane assembly

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Better quality of life

Whether private or public:
With UNIGLAS® | PHON Sound reduction glass restores calm. Even for large window surfaces, take advantage of the quiet atmosphere to work or enjoy comfortable hours with your family.

Scope of application

For the home and office, public establishments like hospitals, sanatoriums and schools with high levels of external noise due to:

- many busy streets and train lines
- air traffic and building sites
- industry, business and agriculture
- pubs, restaurants and nightclubs

Properties

- high soundproofing qualities with top values
- optimally matched product selection for each source of noise
- in 2-pane assembly up to $U_g = 1.0 \text{ W/m}^2 \text{ K}$
- in 3-pane assembly up to $U_g = 0.6 \text{ W/m}^2 \text{ K}$ also up to $U_g = 0.4 \text{ W/m}^2 \text{ K}$
- composite shatter-proof glass with sound proof film, also available with optional security properties
- can be combined with multifunctional insulated glass with thermal insulation, sun and object protection as well as falling protection

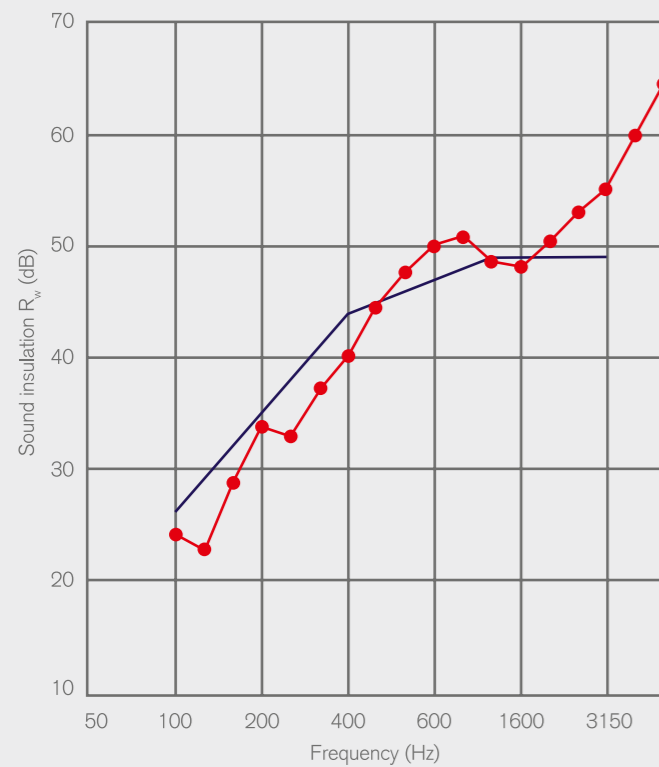
Advantages

- individually matched soundproofing
- noticeably better well-being with light and transparency
- fully adequate noise and thermal insulation
- freely combinable with sun and break-in protection as well as falling protection
- increases the value of the property



The R_w value (sound insulation) is measured in dB. The higher the dB value, the better the sound proofing. An increase by 10 dB is already perceived by human ears as a 50 % reduction in sound.

For technical information, please refer to the UNIGLAS® | INSULATION GLASS product overview and the UNIGLAS® | COLLEGE technical compendium.



Measuring curve

Reference curve

Sound test curves:

The respective insulation value is calculated to a value at different frequencies and according to specific rules: the sound insulation R_w .

SWA, official testing laboratory for noise and thermal measurement.

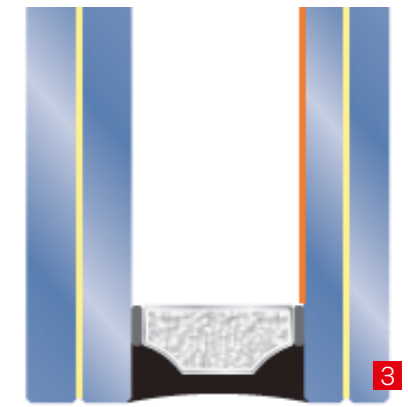
Example 2-pane assembly*



Basic principle of sound insulation: Single panes of different thicknesses possibly with enlarged space between the panes.



Heightened sound insulation through special sound insulation film with optional security properties: Different types of glass with composite or laminate shatter-proof glass with special sound insulation film in one of the panes of insulated glass.



Highest sound insulation through special sound insulation film with optional security properties: Different glass assembly with laminate or composite shatter-proof glass with special sound insulation film in two panes of insulated glass.

*Comparable approach with 3-pane assembly.

R_w : the measurement for sound insulation

Noise is insulated by placing resistance against sources of noise. This resistance is measured precisely through measurement in a laboratory. The respective insulation value is calculated at

different frequencies and according to specific rules to a value: the sound insulation R_w . Put simply, R_w represents a middle value for frequency ranges which are relevant in structural engineering.



In sound insulation it is important to insulate the disturbing frequency ranges particularly strongly. Thus the source of the noise is always important. Equal volumes can require quite different sound insulation glass.

Three categories for the optimal amount of insulation

1 Basic principle of sound insulation:

Different thicknesses of single panes outside and inside are the simplest form of transparent soundproofing. Through its unequal vibrations behaviour (critical frequency), very good sound insulation values are already achieved. If the space between the panes is increased, normally the sound insulation is improved.

2 Heightened sound insulation through special sound insulation film with optional security properties:

For high demands in sound insulation, a pane of insulated glass from laminate or composite shatter-proof glass with special sound insulation film is manufactured. This can also have security properties such as P4A class shatter resistance. The special film for laminate shatter-proof glass is also highly suitable for modern glass canopies, as they can strongly absorb noise, such as the sound of rain.

3 Highest sound insulation through special sound insulation film with optional security properties:

According to requirement, a special sound insulation film is inserted between two panes of insulated panes as an intermediate layer in the pane assembly. Thus the security properties named under point 2 are also achieved.

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C and C_{tr} Spectrum Adaptive Value 1 and 2

Specific insulation: two windows can have the same amount of sound insulation but can have different frequency ranges. So that sound-proof windows are used effectively, the so-called spectrum adaptive value was introduced: C and C_{tr} provide information about the individual performances of windows and insulated glass for the insulation of specific types of noise. The C means correction. The index “tr” refers to the traffic.

C and C_{tr} are fixed correction values: common occurring noise emissions for typical frequency ranges. The actual expected sound insulation thus corresponds to the sum from the amount of sound insulation R_w and the correction value C_{tr}.

Calculation example for the estimated value of the noise level behind the component:

Situation: street traffic in the city	
Calculated average noise emission in front of the component	80 dB
Sound insulation R _w of the component	41 dB
Spectrum adaptive value C _{tr}	-5 dB
Calculation formula	80 dB – 41 dB – (-5) = 44 dB

Result:

The estimated value for the noise level behind the component is 44 dB

Application: C

C (spectrum adaptive value 1) is used for noise which is located more in a broad spectrum and is constant from the frequency.

Example:

- normal frequency sound, like radio and TV
- motorway traffic over 80 km/h
- rail traffic travelling at middle to high speed
- airplanes with jet engines at close distance
- factories whose level of noise frequency is medium to high

Application: C_{tr}

C_{tr} – (spectrum adaptive value 2) is standard for the insulation of deeper frequencies.

Example:

- street traffic in the city
- disco music
- rail traffic travelling at a low speed
- airplanes with jet engines far away
- factories whose level of noise frequency is low to medium

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International Bank in Vienna



Sound insulated house in Bingen

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Practice report

1 An office block with elegant curved glass facade came into being for an international bank in Vienna. UNI GLAS® | PHON Sound reduction glass with multifunctional properties, among other things, was used for the huge windows and facade construction. The brand insulated glass shields the office from street noise from the multilane road running past. At the same time, the insulated glass acts as protection against the intensive radiating midday sun.

2 Only an arm's length away, heavy goods trains thunder through Bingen. For the place in the Rheine Valley that means noise pollution comparable to that of a jet engine starting up. For the inhabitants, the trains are „close enough to touch“ in the true sense of the phrase. Only a few metres divide the railway track from living room and bedroom windows. The Vetter family installed the optimum in sound insulation for their house: UNI GLAS® | PHON Sound reduction glass

Optimal combination

Every source of noise contains a special frequency range. For sound insulation it is important to insulate the disturbing frequency ranges. Equal volumes can require quite different sound insulation glass.

UNI GLAS® | PHON Sound reduction glass is characterised by its modular solution for optimal sound insulation and can be combined with a variety of useful functions such as sun, thermal and object protection.

According to each source of noise, location and how a space is used, the individual noise control concept is adapted to you and your object. Your UNI GLAS® partner is will be happy to help you select the right glass.

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Our proximity: your advantage

