MAKE YOUR WORLD A QUIETER PLACE...

Guidance

British standards recommend interior noise levels for buildings and provide typical traffic noise levels around different types of roads.

BS 8233: Indoor Ambient Noise levels:

Dwellings:
- Bedrooms 30-35dB(A)
- Living rooms 30-40dB (A)

Offices:
- Private 35-40dB (A)
- Open plan (45-50dB (A)

BS 8233: Typical Traffic Noise levels and relevant performance values

- 20 metres from busy motorway (ave speed 62 mph) 78dB (A) Ra
- 20 metres from busy main road (ave speed 31 mph) 68dB (A) RA,tr
- Residential road (screened by houses) 58dB (A) RA,tr

By subtracting the recommended indoor noise level from the typical traffic noise level, you can estimate the appropriate acoustic performance for your windows.

For example, a bedroom window located approximately 20 metres from a buy main road:

External Noise level	-	Target Indoor Noise level	=	Required window Performance
68 dB (A)	-	30-35dB (A)	=	33-38dB (A) RA,tr

Distributor

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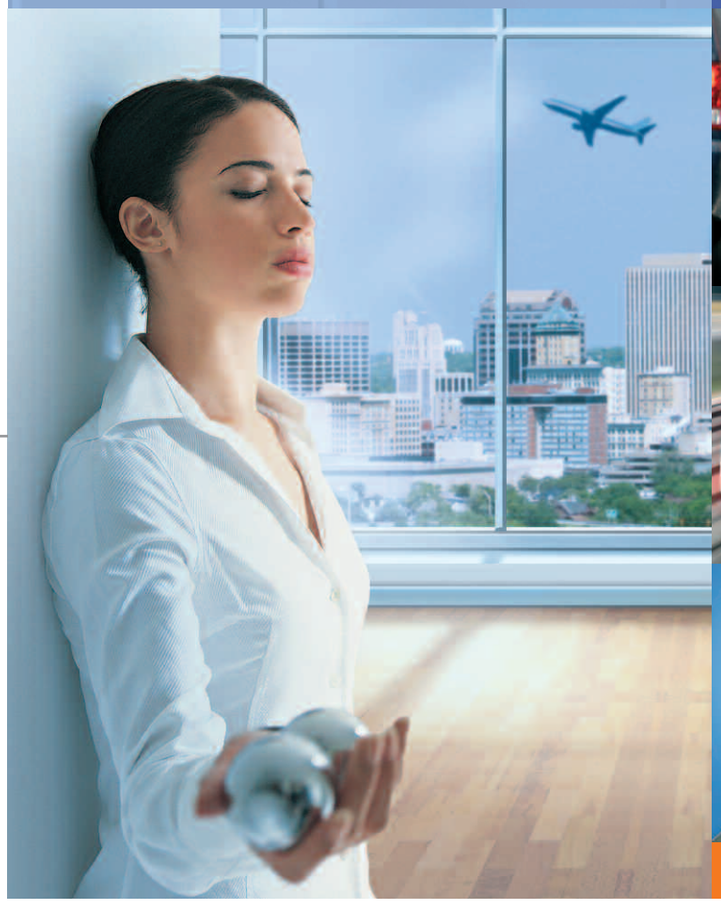
SAINT-GOBAIN GLASS

Noise Control Glazing

A Step by Step Guide



SAINT-GOBAIN GLASS COMFORT

Sources of noise

Noise is any sound that is unwanted, usually because it distracts or disturbs us. Noise can come from a variety of different sources but there are only really two forms:

Airborne - These are sounds which travel in waves through the air and enter our ears. Airborne noise can travel from outside a building to the inside.

Typical examples are :
- Music
- Children playing
- Traffic noise

Impact - These are sounds that are transmitted via vibration through a physical structure such as a conservatory roof.

Typical examples are:
- Rain
- Hail

What is sound?

SOUND is everything that we can hear, it doesn't have to be noise.

NOISE is often referred to as "unwanted sound" and is derived from the latin term meaning nausea.

Sound doesn't have to be complicated...

How does sound travel?

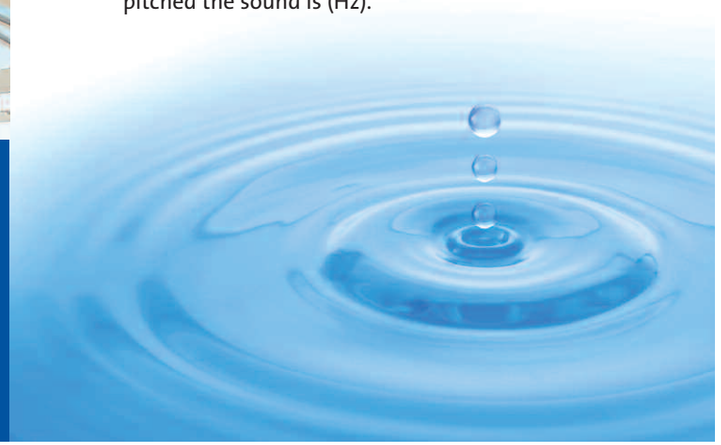
Sound travels through the air like the ripple you see on the surface of water when a stone is dropped into it. The sound waves radiate out in all directions from the source, steadily reducing in intensity or until an object stops their progress.

How do we hear sound?

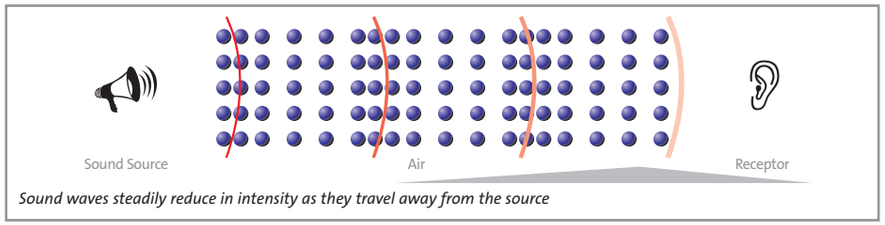
These sound waves travelling through the air cause our ear drums to vibrate which we perceive as sound.

Describing a sound

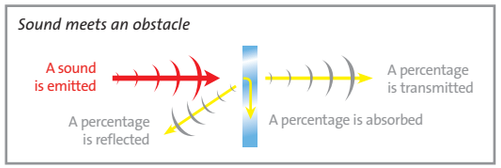
Sound can be characterised in different ways but primarily in terms of intensity and frequency:
- The sound intensity describes how soft or loud the sound is (dB). A low dB value indicates a soft sound - a high dB value a loud sound.
- Frequency (or pitch) describes how high or low pitched the sound is (Hz).

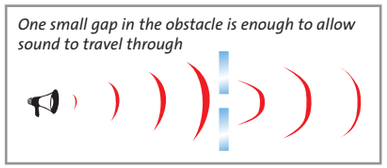


UNDERSTANDING SOUND & ACOUSTICS

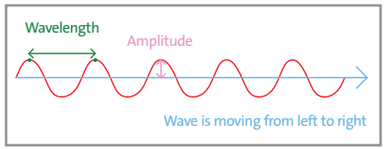


Sound waves steadily reduce in intensity as they travel away from the source



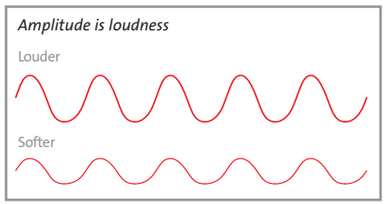


What is amplitude?



Amplitude is directly related to the acoustic energy of a sound, measuring the height or intensity of a sound wave, rather than its length. Both amplitude and intensity are related to sound's power.

What is loudness?

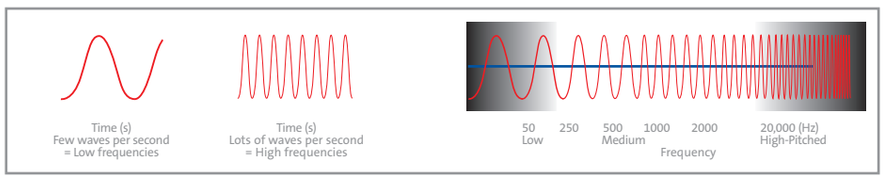


Loudness is the way in which we perceive amplitude. A particular change in amplitude is not necessarily perceived as being a proportionate change in loudness. That is because our perception of loudness is influenced by both the frequency and quality of sound, measured as Sound Pressure Level (SPL).

Changes in SPL (dB):	*+/-3*	*+/-5*	*+/-10*
Apparent loudness change:	*just perceptible*	*clearly noticeable*	*Twice (or half as loud)*

What are low and high frequency sounds?

Frequency is defined as the number of vibrations per second. The higher the number of vibrations per second, the higher the pitch. Pitch is the way we perceive the frequency of sound. Frequency is expressed in Hertz (Hz). Tones that are high in pitch are high frequency (many vibrations per second) and tones that are low in pitch are classed as low frequency.



Our perception of sound

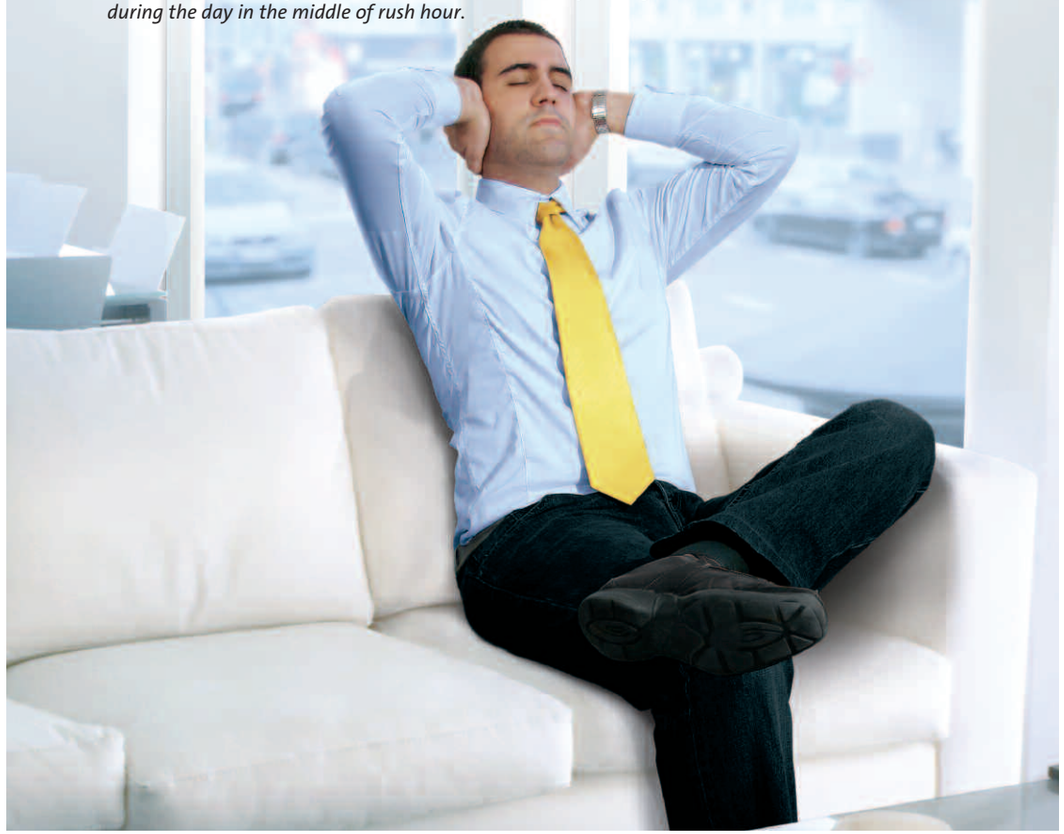
We are not normally exposed to only one sound frequency at at a time. In our daily lives we are exposed to a mixture of different sounds of differing frequencies at any given point, cars nearby, people talking etc.

This combination is often what is described as noise and can be highly annoying and unpleasant to the human ear.

Noise is difficult to define and is down to personal interpretation and is subjective according to:

- The person receiving the sound
- The circumstances they are in
- The type of sound
- The duration the listener is exposed to the sound.

For example:
- A siren going off for a few seconds may be mildly irritating whereas a siren that goes on for a prolonged period can be become both disturbing and painful.
- We notice the noise of a loud motorbike in the middle of the night where as this noise is lost during the day in the middle of rush hour.



UNDERSTANDING SOUND & ACOUSTICS

The dangers of sound

Noise can have a serious effect on peoples health and wellbeing, with problems including:

Physical
Hearing impairments
Ear damage
Fatigue & sleep loss
Heart problems

Psychological
Interference with speech
Concentration problems
Annoyance & Stress
Social problems

How to reduce noise...

The three possible actions to reduce noise are:

1. Take action regarding the source
2. Take action regarding the reception
3. Take action regarding the transmission of sound

The only realistic option being point 3!

What is acoustic laminated glass?

SGG STADIP SILENCE contains a special acoustic interlayer which not only bonds the glass but also acts as a dampening core between the glass panes, preventing sound frequencies vibrating from one pane of glass to the other.

Normal windows have a 'resonant frequency', at which they vibrate more significantly reducing their acoustic insulating performance. SGG STADIP SILENCE double glazed units perform at least 20% better than conventional units comprising annealed or normal laminated glass. At the critical resonant frequency they can perform up to 10dB better.

If a window incorporates an opening of any kind it is important that well performing seals are also fitted. Sound will travel through any small gap and will have a detrimental effect on the overall acoustic performance of the window.

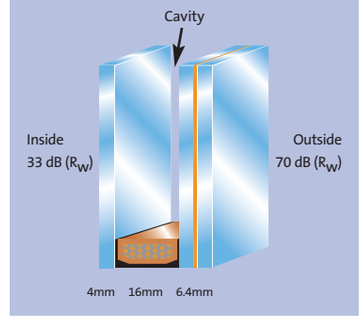
An airgap of only 1% of the total window can reduce the sound insulation by up to 10dB, meaning that the noise passing through sounds twice as loud as it would if well sealed.

The result....
SGG STADIP SILENCE absorbs and weakens sound, helping to act as a barrier to both airborne and impact noise, making your home a much quieter place.

Characterisation of sound

Level (dB)	IMPRESSION	Type of Noise
140	UNBEARABLE SOUND	Siren
130		Threshold of Pain
120	PAINFUL SOUND	Jet Plane
110		
100		Pneumatic Drill
90	BEARABLE SOUND	Noisy Street
80		
70		Street Traffic
60	MEDIUM	Conversation
50		Calm Apartment
40	QUIET	
30		Country Residence
20	VERY QUIET	Quiet Forest
10		
0	SILENCE	Threshold of Hearing

SGG STADIP SILENCE
Acoustic PVB laminated safety glass



The benefits of SGG STADIP SILENCE

SGG STADIP SILENCE not only provides a minimum 20% improved acoustic protection, its features also include:

- Optimum optical quality
- For an equivalent acoustic performance a thinner, lighter glass configuration can be used
- All the safety & security properties of traditional laminated glass, providing protection against accidental & wilful damage. In the unfortunate event of an accident or attempted burglary SGG STADIP SILENCE stays in place, attached to the interlayer.
- UV filtration helps protect furnishings from fading.
- Can be combined with many other high performance products from the Saint-Gobain range providing greater flexibility and helping you realise your glazing requirements.

UNDERSTANDING SOUND & ACOUSTICS

Noise - the facts about what we think of it...

- The Office for National Statistics' Social Trends survey says that complaints about noise pollution from UK households increased nearly five-fold between 1984/5 and 2004/5.
- Nearly 1/3 or people in Britain are unhappy with noisy neighbours, and for 14% it has an impact upon their quality of life (MORI 2003).
- Amplified music remains the main source of noise complaint in England, Scotland & Wales, with barking dogs a close second (NSCA 2004).
- A survey by Alliance & Leicester showed that 1/4 of potential buyers would be put off by noisy neighbours, to put this into context only 2% said they would be deterred by shabby décor.
- As little as a 5-decibel reduction in noise level can cut the risk of hearing loss in half.