INFORMATION SHEET - NOISE REDUCTION GLAZING

Climatec
Windows & Doors

Reducing Noise Intrusion

Sound travels through the air, creating sound waves and it is these waves that cause our ear drums to vibrate and interpreted by the brain as sound. Noise is defined as being unwanted sound. Noise is often a sound that distracts or disturbs us.

A glazed unit alone will not reduce noise levels substantially. When reducing sound levels inside a building, various considerations need to be made around the whole window performance for an effective sound barrier.

- **Glass:** Typically, the thicker the glass the better the level of sound reduction. Different thicknesses of glass are effective at reducing noise and the size of the air gap between the panes of glass makes a significant difference to the level of noise insulation, the larger the better. The addition of a laminated glass pane (2 pieces of glass bonded together) is also a further improvement in reduction of noise.

- **Frame Material:** The choice of window frame itself will tend to enhance the performance of the glass and usually comes down to the hardness of the material. For example the solid nature of timber means it attenuates sound particular well, however the flexibility of materials such as aluminium means this is more likely to conduct sound. When specifying uPVC windows, it's worth considering that any reinforcement is also likely to reduce the potential sound attenuation.

- **Ventilation:** Building ventilation required can also dictate the window's sound acoustic performance. Trickle vents allow small amounts of ventilation to avoid issues such as condensation, but will also allow a certain level of noise through as well. Windows using the night vent option will also see noise infiltration. However modern homes with Mechanical Ventilation with Heat Recovery systems are more likely to have windows that don't open and therefore much more soundproof. Acoustic slot vents can also help against noise through trickle vents.

- **Installation:** The quality of the installation can also determine the performance of sound reduction. Poor installation that leaves air gaps around the window or sashes that do not close correctly will allow noise to infiltrate the home. Sealing the window around it's perimeter using an expanding foam will enhance both it's energy and sound insulation properties.

Acceptable Noise Levels for Habitable Rooms

British Standard 8233:2014 'Guidance on sound insulation and noise reduction for buildings' includes internal noise criteria of habitable rooms in residential dwellings, as shown below. (This is the sound in the room with windows closed).

Location	Desired		Reasonable	
	07:00 to 23:00	23:00 to 07:00	07:00 to 23:00	23:00 to 07:00
Living room	35dB	-	40dB	-
Dining room	40dB	-	45dB	-
Bedroom	35dB	30dB	40dB	35dB

A decibel **(dB)** *is a unit of measurement for sound.*

A-weighted decibels, **dBA,** *are an expression of the relative loudness of sounds in air as perceived by our ears.*

Required Window Performance Example

External Road Traffic Noise	Target Indoor Noise Level	Required Window Performance
20m from a motorway. Average speed 62mph. Typical Noise Level = 76dBA Ra tr	Bedroom 30-35dB	43-48 dBA
20m from a busy main road. Average speed 32mph Typical Noise Level = 68dBA Ra tr	Bedroom 30-35dB	33-38 dBA
Residential road screened by houses Typical Noise Level = 58dBA ra tr	Bedroom 30-35dB	33-28 dBA

The higher the dBA window performance rating, the better the noise reduction properties

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Glazed Unit Options

A double glazed unit is undoubtedly better than a single glazed pane and noise reduction is achieved by altering the frequency of noise travelling through the glass. This is achieved by varying the thickness of the sealed unit make up, using acoustic glass and considering the air gap size.

Noise is measured in Decibels (dB) and this noise rating will be reduced by the dB rating of the glass unit. The higher the rating the less noise will pass through the glass.

Double Glazed Unit

Sound Outside	Sound Reduction Rw (C, Ctr) dB	Sound Inside
Outside 70dB	4/20/4 Unit absorbs 32dB (-4, -1)	Inside reduced to 38dB
Outside 70dB	6/16/6.8 Acoustic Unit absorbs 39dB (-6,-1)	Inside reduced to 31dB

The table below shows the typical unit make up and their sound reduction values:

Unit Make Up	Rw	Ctr	C
28mm			
4/20/4	32dB	-4	-1
4/18/6.4	37dB	-5	-2
4/18/6.8A	39dB	-6	-2
6/16/6	35dB	-4	-2
6/12/10	37dB	-4	-1
6/16/6.4	37dB	-5	-2
6/16/6.8A	39dB	-6	-1
36mm			
10/20/6	38dB	-4	-2
4/12/4/12/4	31dB	-5	-2
4/10/6.4/12/4	36dB	-2	-1
6.8A/10/4/10/6	41dB	-6	-2
44mm			
4/16/4/16/4	32dB	-5	-1
4/14/6.4/16/4	40dB	-6	-2
6.8/14/4/14/6	43dB	-7	-2

Rw - Most commonly used, this is a weighted decibel (dB) reduction incorporating a correction for the human ears response to sound.

Ctr - This is the decibel reduction for the specific sound frequencies of typical road traffic noise in towns and cities.

C - This is the mean average sound reduction in decibels across a range of frequencies.

A = acoustic laminate

Triple Glazing: It is worth noting that triple glazing doesn't always mean better sound performance. In some cases it can actually be worse than a double glazed unit and with the added cost of a triple glazed unit, this may not be the best route to follow.

Acoustic Glass: Acoustic glass is a laminated glass that absorbs and weakens sounds and has the added advantage of safety and security to the home. The interlayer also filters 99% of the UV light which can be the cause of faded curtains, carpets and furniture.

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