



> VIRIDIAN GLASS GUIDE™

Noise

Designed to reduce the outside noise so you can enjoy a little peace and quiet.

Products: VLam™ Hush
ComfortHush™

Viridian 
we ♥ glass™

A sound solution for effective noise reduction

Reducing Unwanted Noise

Whether it's from traffic, aircraft, trains, factories or even neighbours, unwanted noise is a nuisance but it can be reduced with the right selection of glass. The **VLam™ Hush** and **ComfortHush™** range of laminated glass is specifically developed to do just that.

Reduce Vibration

Ordinary glass can vibrate at the same frequency as the noise source, allowing sound to penetrate through the window. **VLam™ Hush** and **ComfortHush™** includes a special 3-layer laminate that has been specifically engineered to reduce vibration, making it effective in reducing urban noise.

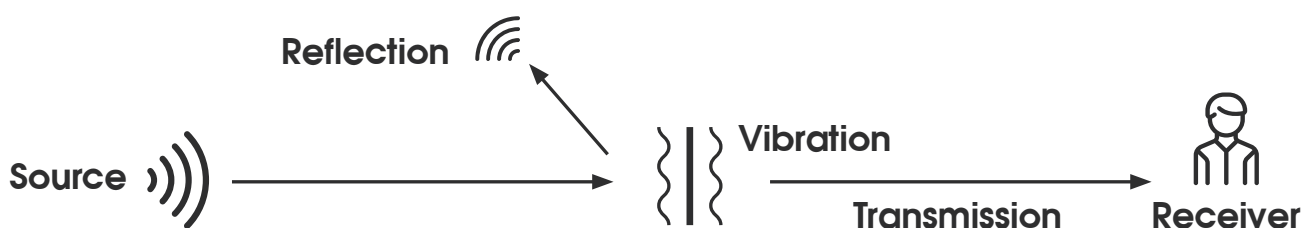
Reduce the Transmission of Noise

There are three things that occur when sound waves encounter a window:

1. They may be **reflected** away, causing little concern to those inside the building
2. They may be **absorbed** through dampening and dissipated, causing little concern to those inside the building
3. **What isn't reflected or absorbed is transmitted through the window by vibration or air leakage**

Addressing a Noise Problem

Typically the weakest point in a home is the windows. Installing windows with good acoustic performance needs to be supported with the careful selection and insulation of walls, floors and roof materials to enhance the overall acoustic performance of your home. It is essential to ensure that all other paths in the exterior of the building have also been sealed.





Typically, suburban traffic noise is a low frequency noise, while aircraft produce a high frequency noise.

Table 1

Common sound levels		Recommended interior noise levels	
Environment	dB		dB
Threshold of hearing	0	Bedroom	30-40
Conventional speech	65	Classroom	35-40
Average traffic (curbside)	70	Living room	40-45
Busy traffic	75	Private office	40-45
Loud traffic	80	Open office	45-50
Live band (20 metres)	105		

Table 2 - Sound Insulation data (dB)

Thickness (mm)	Monolithic							Laminated			VLam™ Hush			
	3	5	6	10	12	15	19	6.38	10.38	12.38	6.5	8.5	10.5	12.5
Single	30	32	32	36	37	37	40	33	36	37	36	37	38	40
ThermoTech™	-	34	35	-	-	-	-	-	-	-	40	42	43	-

ThermoTech™ is an IGU with 16mm airspace and 6mm, 8mm or 10mm outer and 8.5mm VLam™ Hush inner.

Note: Contact Viridian for additional test data



Designing to Solve a Noise Problem

There are generally three components to be considered when solving a noise problem. These are the external noise, the noise reduction of the wall (windows and glazing) and the resulting noise in the room. The process of design requires that the external noise level is determined by measurement and the desired internal noise level is decided (Refer to table 1).

The source of the noise may be higher at certain frequencies. Typically, suburban traffic noise is a low frequency noise, while aircraft produce a high frequency noise.

A detailed solution would involve measuring the nature and intensity of the offending sound and choosing a glass product which would reduce the intensity sufficiently at all frequencies.

It should be noted that glass is only one part of the room and all other components must be assessed as well.

Reduce Air Leakage

Cracks, crevices and even the smallest gaps will greatly reduce the performance of windows by providing opportunities for sound to travel through. It is critical that **VLam™ Hush** and **ComfortHush™** are used in combination with a carefully selected window frame that is well sealed to significantly reduce air leakage. Many window manufacturers make and test windows designed to improve acoustic performance and energy efficiency. It is important these windows are professionally installed to reduce air leakage by ensuring a good seal between the exterior of the window and the wall it is being installed into.

Sound Reduction Index

- The Weighted Sound Reduction Index (**R_w**) is a number used to rate the effectiveness of a soundproofing system or material. Increasing

the **R_w** by one translates to a reduction of approximately 1db in noise level. Therefore, the higher the **R_w** number, the better a sound insulator it will be.

- The **coincidence dip** is the frequency at which the glass panel vibrates in unison with the frequency of the incident sound pressure waves. The result is the sound insulation properties of glass being strongly reduced at this specific frequency.



The nature of the decibel scale illustrates how a small variation in decibels equates to quite a large difference in what we hear. A difference of 5dB is identifiable by the human ear.

Common Solutions

Thick glass – the greater the thickness the better the noise reduction for low frequencies such as traffic noise. However, standard glass has a coincidence dip when the glass vibrates at the same frequency as the noise source. This is dependent on glass thickness but generally occurs at higher frequencies.

Laminated glass – the interlayer is particularly effective at dampening which provides superior sound reduction over the same thickness monolithic glass. Further, the dampening effect of laminated glass reduces the coincidence dip at these higher frequencies and therefore is a solution for aircraft and voice noise.

Double glazing – standard insulating glass units do not provide good noise reduction. For insulating glass units to be effective, an air gap of 50mm to 100mm needs to be provided. However, the incorporation of one or two panels of laminated glass, a glass of differing thickness or **VLam™ Hush** into the unit provides excellent results.



**Normal
Conversation** - 60dB



Dog Barking 70dB -
2x as loud
as 60dB



Loud Traffic
80dB - 4x as loud
as 60dB



Train Whistle at 150m
90dB - 8x as loud
as 60dB



Lawn Mower
100dB - 16x as loud
as 60dB



Rock Concert
100dB - 16x as loud
as 60dB



PRODUCT

VLam™ Hush

VLam™ Hush is a laminated glass that uses a specially developed interlayer to dampen noise, providing enhanced sound insulation performance.

This special interlayer targets sounds through the frequency range with an enhanced effect on higher frequencies - the most sensitive range of human hearing. Common solutions for noise reduction is to use thicker glass, **VLam™ Hush** means that thinner and lighter glass can be used for equivalent acoustic performance.

VLam™ Hush reduces the coincidence dip of standard monolithic and laminated glass.

Considerations

Proper assessment of the entire building is required in order to develop an adequate acoustic solution. Selection of frames, walls, floor and roof materials is essential to ensure good overall acoustic performance.

✓ **VLam™ Hush uses a special interlayer that targets sounds through the frequency range with an enhanced effect on higher frequencies - the most sensitive range of human hearing.**

Features and Benefits

- **VLam™ Hush** is a laminated Grade A safety glass (AS/NZ2208).
- **VLam™ Hush** can be used in a wide range of internal and external applications.
- Available in 6.5mm to 12.88mm thicknesses.
- Can be combined with other solar control options.
- Can be incorporated in a double glazed unit.
- Reduces UV radiation by 99% reducing fading up to 8.5 times over normal glass.

Applications

- Windows & Doors
- Facade
- Partitions
- Overhead Glazing

Thickness

- From 6.5mm to 12.88mm

How to Specify

- **Select glass name**
VLam™ Hush
- **Select thickness – process**
6.5mm to 12.88mm – Laminated
- **Select colour**
Refer to product range chart

✓ Product range

	Thickness (mm)						
VLam™ Hush	6.5	6.88	8.5	10.5	10.88	12.5	12.88
Clear	◆		◆	◆		◆	
Grey		◆			◆		◆
Translucent		◆			◆		◆

Other custom laminated options available

✓ **VLam™ Hush can be used in a wide range of internal and external applications.**



PRODUCT

ComfortHush™

ComfortHush™ is an acoustic performance glass which also features a durable Low E coating. It is a Grade A laminated safety glass that uses a special 3-layer acoustic PVB laminate that is specifically designed to reduce sound transmission. The inclusion of a durable Low E coating also provides improved energy efficiency performance, by helping to keep homes and buildings cooler in summer and warmer in winter.

ComfortHush™ 6.5mm and 6.88mm provides a 6dB improvement compared to ordinary 3mm glass found in many residential windows. In fact, ordinary 3mm glass would need to be at least three times as

thick to offer the equivalent sound reduction as **ComfortPlus™** 6.5mm and 6.88mm.

Considerations

ComfortHush™ fits into most single glazed window frames. However, to avoid noise leaks, you need to ensure that **ComfortHush™** is installed in a frame that's well sealed and professionally fitted. If the frame isn't sealed properly, then **ComfortHush™** can't work to its full potential.

Glass must be installed with the Viridian label facing to the exterior of the building.

✓ **ComfortHush™** uses a laminated safety glass that uses a special 3-layer acoustic PVB laminate that is specifically designed to reduce sound transmission

Features and Benefits

- **ComfortHush™** 6.5mm and 6.88mm can be installed into most single glazed window frames.
- **ComfortHush™** 6.5mm and 6.88mm provides up to 39% better insulation than ordinary 4mm glass resulting in a more comfortable home and energy savings all year round.
- Reduces UV radiation by 99% reducing fading up to 8.5 times over normal glass.
- **ComfortHush™** is a laminated Grade A safety glass (AS/NZ2208).

Applications

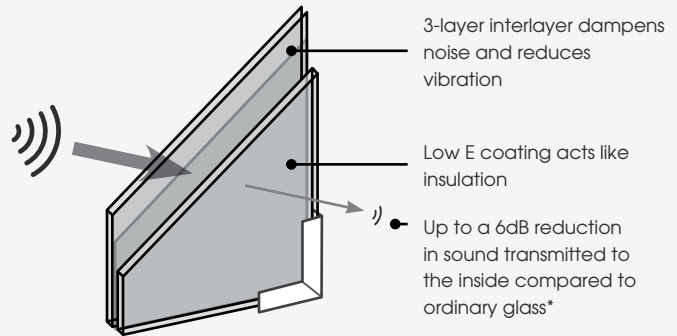
- Windows & Doors
- Facades
- Overhead Glazing

Thickness

- From 6.5mm to 10.88mm

How to Specify

- **Select glass name**
ComfortHush™
- **Select thickness – process**
6.5mm to 10.88mm – Laminated
- **Select colour**
Refer to product range chart



✓ **VLam™ Hush uses a special interlayer that targets sounds through the frequency range with an enhanced effect on higher frequencies - the most sensitive range of human hearing.**

✓ Product Range

	Thickness (mm)			
ComfortHush™	6.5	6.88	10.5	10.88
Clear	◆		◆	
Neutral	◆		◆	
Grey		◆		◆
Translucent		◆		◆

