



SOUNDPROOFING WINDOWS

EVERYTHING YOU NEED TO KNOW

SOUND INSULATION FOR WINDOWS

A COMPREHENSIVE GUIDE

In today's world, achieving effective sound insulation for your windows is more attainable than ever before. Thanks to cutting-edge advancements in retrofit double glazing, you can enhance both the aesthetics of your windows and their ability to reduce noise, regardless of how old or intricate your existing timber windows may be. It's a valuable investment in the comfort of your home.

Whether you reside in a bustling city centre or a tranquil countryside setting, the challenge of minimising noise pollution is a common one. The myriad of sounds that can disrupt your peace and quiet is a testament to the modern world we live in.

However, there's a solution at hand.

If you're weary of incessant disruptions, your first step should be to explore the realm of sound insulation for your windows. By gaining a thorough understanding of the soundproofing options available today, you'll be well-equipped to make an informed decision on reducing noise while preserving the character and appeal of your windows, all at an exceptional value.

Numerous methods exist for insulating your windows against sound, but not all of them are practical or cost-effective. With a comprehensive knowledge of the available options, you can select the most suitable approach to insulate your windows and achieve the tranquillity you desire.

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01

UNDERSTANDING NOISE POLLUTION

EMBRACE CITY LIVING WITH TRANQUIL WINDOWS

City life offers an exciting hustle and bustle, but the constant street noise and unending traffic can be a major disturbance. Are you yearning for a peaceful haven to rest, work, or study?

NOISE POLLUTION BEYOND THE CITY

The challenge of noise pollution isn't confined to city dwellers; even suburban and rural areas have their share of disruptive sounds. For young families, night owls, and those sensitive to noise due to age or health concerns, quiet surroundings can significantly impact your quality of life.

Daily exposure to noise pollution can lead to increased stress and anxiety, potentially causing severe health issues when sleep is consistently disrupted. The consequences include:

- **Increased Stress:** Persistent noise raises stress levels.
- **Anxiety and Irritability:** Continuous noise can lead to heightened anxiety and irritability.
- **Sleep Disruption:** Noise can significantly disrupt sleep patterns, leading to fatigue and poor overall health.

While some sounds, like birdsong at sunrise or the gentle rhythm of rain, are delightful, noise pollution encompasses those jarring and disruptive sounds that are too loud, persistent, and capable of disrupting your sleep, work, or study routine.

DIFFERENT TYPES OF NOISE POLLUTION



TRAINS AND AIRCRAFT

Living in proximity to airports or train tracks exposes you to potentially hazardous levels of noise pollution. Research has established a concerning connection between residing near an airport and an elevated risk of hospital admissions and fatalities attributed to heart disease. Trains, when situated within 15 metres, can generate noise levels reaching as high as 80 decibels, a threshold with the capacity to harm your hearing.



TRAFFIC

In urban environments, the most prevalent form of noise pollution is the constant presence of heavy trucks rumbling down the streets and the ever-present flow of road traffic.

The noise from road traffic can vary from a bothersome 45 decibels to a disruptive 75 decibels. Particularly, the roar of motorcycles and the thunderous passage of heavy trucks can contribute to sudden spikes in noise levels.

SOCIAL NOISE

Disturbances from Neighbors and Outdoor Chatter



The unwelcome intrusion of noisy neighbours, outdoor conversations, incessant mobile phone chattering, blaring music, and raucous parties can all culminate in an exasperating cacophony.

By soundproofing your home, you have the power to disperse the travelling sound waves and savour the peace and tranquillity that you rightfully deserve.

02

DOUBLE GLAZING

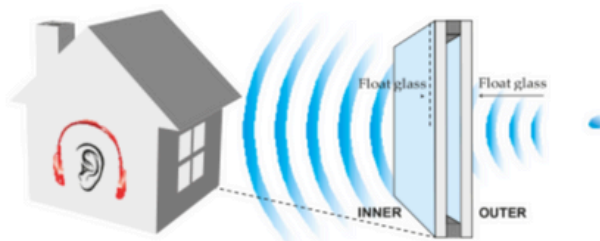
AND YOUR PEACE OF MIND

TAILORING ACOUSTIC PERFORMANCE THROUGH WINDOW GLASS

The acoustic performance of your windows can be greatly improved by considering both the thickness and the type of glass used.

Double glazing, when applied, delivers a substantial reduction in noise pollution. It effectively insulates against mid to high-frequency sounds, encompassing disruptive elements such as traffic, outdoor conversations, passing trains, aircraft, heavy machinery, and even loud music – all common auditory disturbances within any neighbourhood.

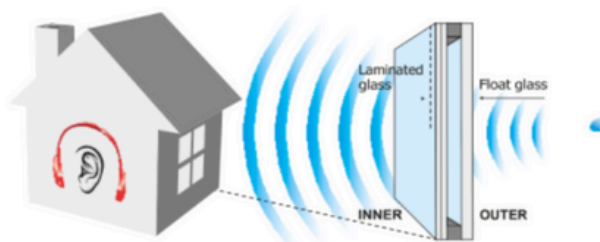
GOOD



SOLUTION: IGU

Using thick glass and glasses of different thickness is **Good** for sound control.

BETTER

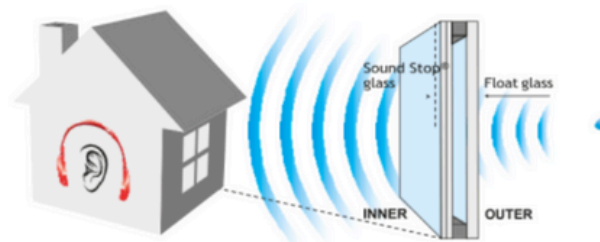


SOLUTION:

Laminated IGU

Using standard PVB laminated glass is **BETTER** as the interlayer dampens sound vibration.

BEST



SOLUTION:

SoundStop IGU

Using special acoustic laminated glass is **BEST**, especially if one pane is thicker.

UNLOCKING ENHANCED COMFORT WITH THERMAWOOD RETROFIT DOUBLE GLAZING

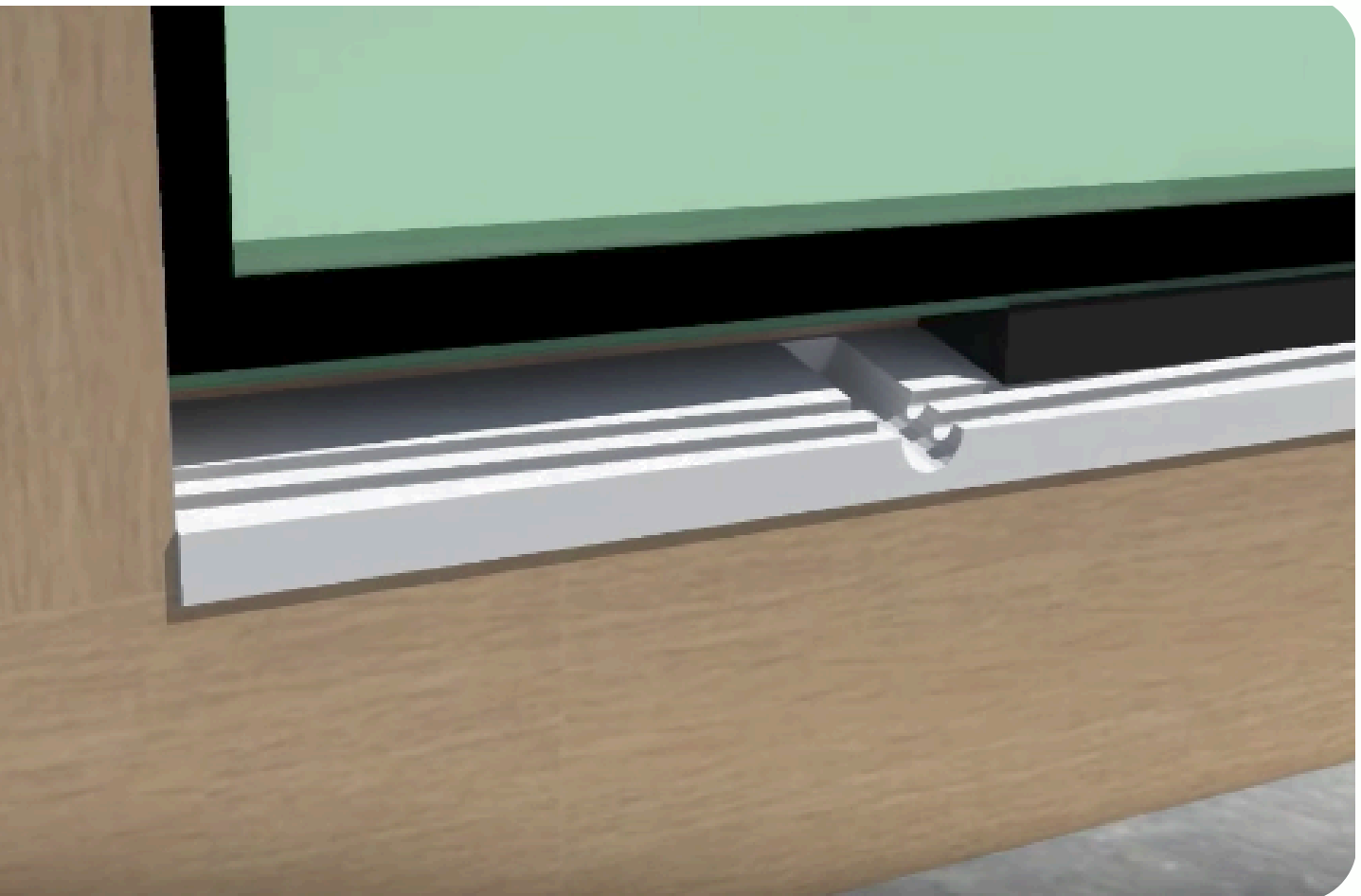
Retrofit double glazing is the process of upgrading your existing single-pane windows with an insulated glass unit (IGU). This IGU consists of two glass panes separated by a spacer, which is then filled with an inert gas like Argon.

The dual layers of glass, along with the insulating gap, collectively bolster the windows' insulation capabilities, effectively reducing noise intrusion and bolstering energy efficiency. The standard 3mm or 4mm single pane often falls short in blocking out the everyday noise we encounter.

The outcome of double glazing is a significantly improved interior space—quiet, comfortable, and with superior indoor air quality, particularly if you opt for retrofit double glazed windows featuring Thermawood's patented dry glazed retrofit system, complete with built-in drainage design.



OPTIMISING YOUR WINDOWS FOR PEACE, SAVINGS, AND PROPERTY VALUE



Double glazed windows offer a trifecta of benefits: they effectively mitigate noise pollution, bolster energy efficiency, and enhance the value of any residential or commercial space.

However, it's important to note that not all double glazing systems are created equal. The choice between new double glazed windows and retrofit double glazing comes with significant cost disparities, with thousands of dollars separating the two options.

Moreover, the final aesthetic and functionality can vary, as the installation processes are distinctly different. Therefore, the question then arises: which option is superior for achieving optimal soundproofing for your windows?

03

NEW WINDOWS OR RETROFIT DOUBLE GLAZING

WHAT'S THE DIFFERENCE?



REGULAR WINDOWS

RETROFIT DOUBLE GLAZING



Both new windows and retrofit double glazing offer effective noise reduction and can achieve impressive acoustic performance. Regardless of your choice, you have the flexibility to select from various noise-reducing glass types, including laminated and acoustic-grade glass, as well as different thicknesses to attain your desired soundproofing results.

Nevertheless, critical distinctions come into play that will impact the functionality of your windows and influence the overall cost of your soundproofing project.

Retrofit double glazed windows are designed to preserve the integrity of your existing timber windows. This allows you to maintain the original character of your home or building, resulting in a more aesthetically pleasing finish. With Thermawood's unique retrofit double glazing system, acoustic seals are integrated into the windows, ensuring optimal noise reduction without concerns of seals peeling away when the windows are opened – a common issue with new double glazed windows where DIY seals are often added as an afterthought.

It's important to note that retrofit double glazing is exclusively applicable to existing timber windows, whereas new double glazing is suitable for various window frame materials, including vinyl, composite, and metal.

Retrofitted windows not only offer superior acoustic performance but seamlessly blend with the existing character of your property, enhancing its beauty and charm.





04

THERMAWOOD VS SECONDARY GLAZING FOR SOUNDPROOFING?

Secondary glazing involves the addition of an acrylic sheet on the interior side of your existing window, often secured with magnets. This effectively creates a thicker sound barrier, as sound must traverse through a larger gap. For example, if your single-glazed window was 4mm, adding a 3mm acrylic sheet results in a 7mm thick sound barrier, with an air gap between the glazings.

LIMITATIONS OF SECONDARY GLAZING

While secondary glazing can achieve decent acoustic performance with a larger gap between existing glass and the secondary glaze, it has certain limitations:

- Moisture and dust buildup in the cavity quickly.
- Many individuals find the appearance of secondary glazing unappealing.
- It restricts the use of high-performance glass options like Acoustic Grade laminated glass, Low E glass for improved insulation, or safety glass.
- It lacks the insulating benefits of argon gas, which can be introduced in the space between double-glazed panes.



For heritage windows with sash designs, the use of acrylic becomes problematic, making it nearly impossible to employ secondary glazing successfully. These factors, combined with the impact secondary glazing has on the aesthetic appeal of windows, make it an unsuitable choice for soundproofing historic period windows.



In contrast, Thermawood's retrofit solution offers the ideal solution to retain the character of your heritage windows while elevating them into the 21st century as high-performance windows.

Surprisingly, many property owners are unaware that retrofit double glazing costs nearly the same as secondary glazing. By opting for retrofitting, you achieve savings similar to choosing a more cost-effective alternative to new double glazed windows, all while enjoying the delightful acoustics and aesthetics of high-performance retrofitted windows.

05

WHY DIY SOUND INSULATION MIGHT

NOT BE THE BEST SOLUTION

Even if you're a dedicated do-it-yourself enthusiast, it's essential to consider the potential drawbacks before embarking on a DIY sound insulation project for your windows.

SAFETY CONCERNS

Some individuals opt to attach a piece of acrylic or glass to the interior of their windows themselves. However, there are several reasons to exercise caution. Firstly, there's the matter of safety – glass can be heavy and dropping it on a foot or ankle is far from desirable.



IMPACT ON WINDOW FUNCTIONALITY

DIY projects can also impact the way your window functions. Making modifications yourself may lead to a sacrifice in the window's intended operation, which can be inconvenient and frustrating.

AESTHETIC AND PROPERTY VALUE

Another significant concern is the appearance of your window. A poorly executed DIY job could leave you with an unattractive window, potentially decreasing the overall value of your property.

POTENTIAL NEW PROBLEMS

If you compromise any aspect of your window while attempting to improve acoustics on your own, you might achieve slightly better soundproofing but could introduce new problems like reduced functionality, condensation issues, or aesthetic flaws.

06

HOW DOES RETROFIT DOUBLE GLAZING

REDUCE NOISE?

When you opt for a retrofit double glazing window conversion, you'll not only enjoy the insulation benefits of brand-new double glazed windows but also the convenience of retrofitting.

RETROFITTING PROCESS

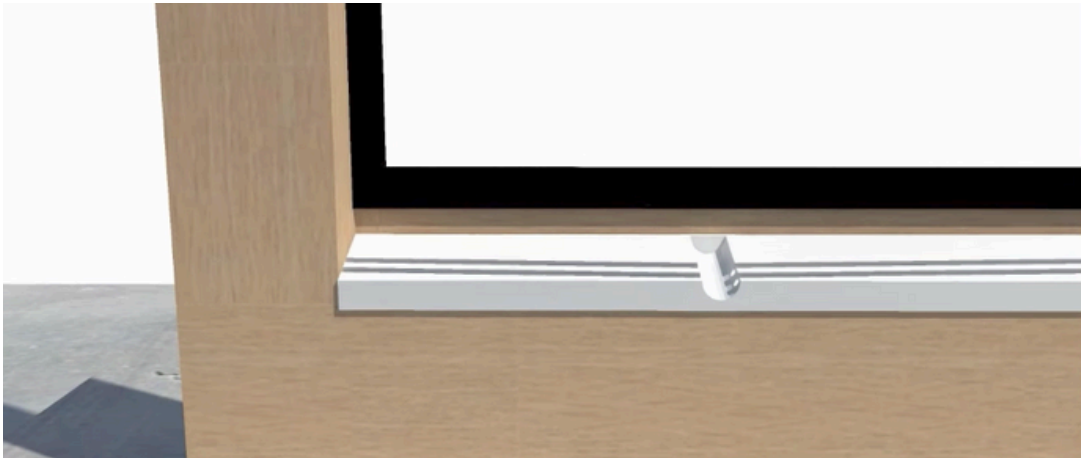
Retrofitting involves the removal of the existing single glass pane, all without the need to tear out the entire window frame. This means you get to keep your existing windows while benefiting from exceptional noise reduction.



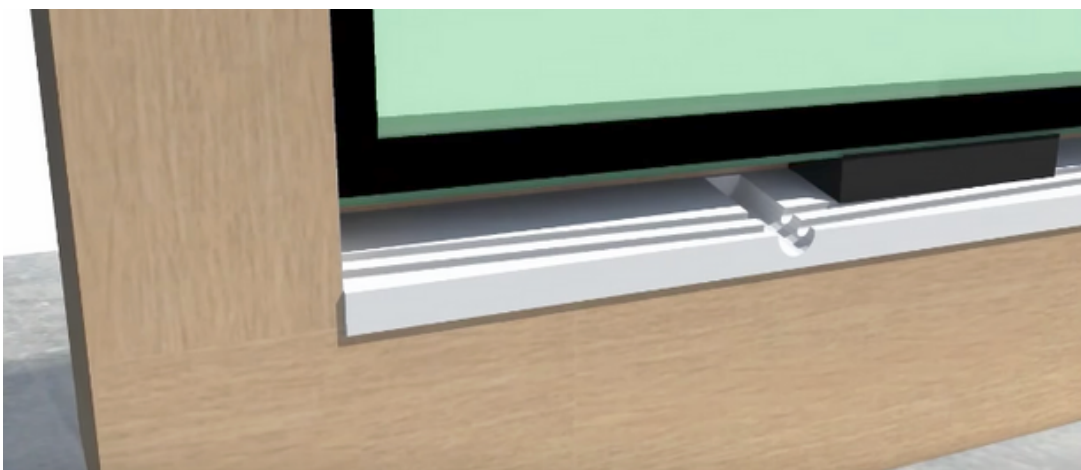
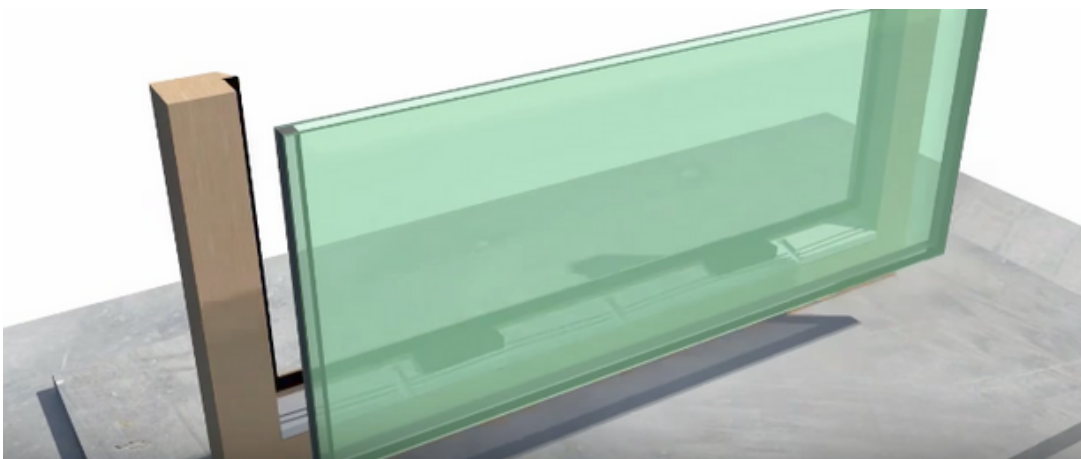
The process starts with the removal of a small part of the existing frame, using Thermawood's unique tooling to create a 15-degree slope. Then, our patented drainage system adaptor is installed, along with top-of-the-line draught and acoustic sealing.



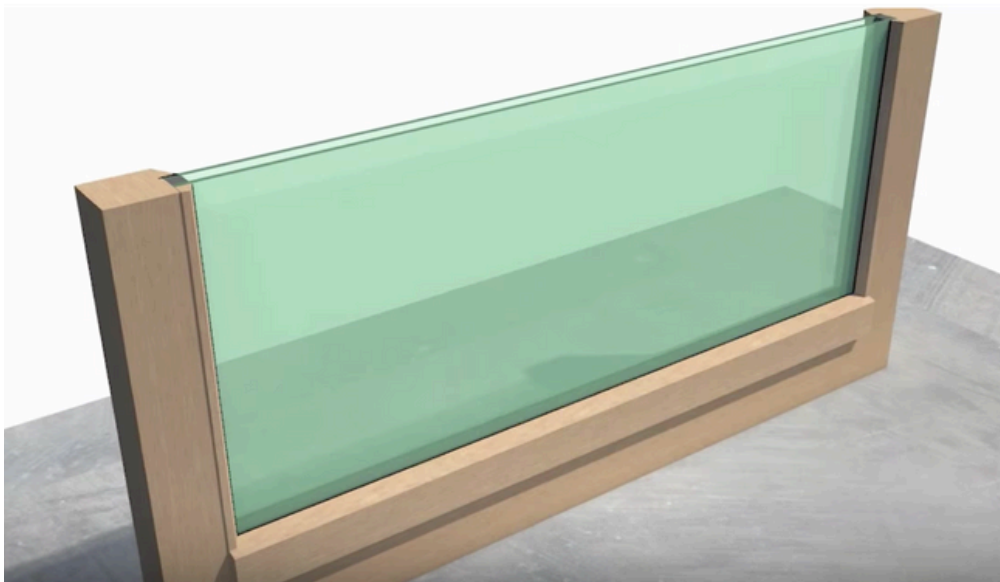
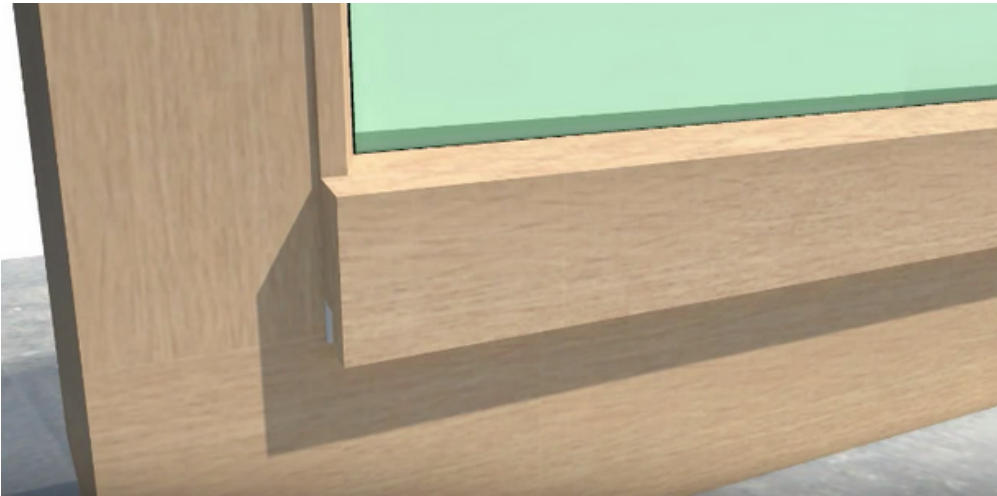
By incorporating acoustic seals into the retrofit design, you'll experience significantly enhanced noise reduction without compromising the functionality of your windows.



The next step involves the installation of double glazing and the attachment of the front seal.



To finish, the window beading is added, completing the retrofit double glazing installation.



CUSTOMIZABLE ACOUSTIC PERFORMANCE

You have the flexibility to choose from various types of glass to achieve your desired acoustic performance. Your choice will depend on the source of your noise pollution and the level of noise reduction you seek.

With the right combination of glass type, thickness, and acoustic seals, retrofit double glazed windows create a formidable noise barrier, transforming your interior into the peaceful haven you've always wanted.

07

**CAN YOU CUSTOMISE
EACH WINDOW**

IN A BUILDING?

When it comes to insulating the windows in your property, you have the freedom to tailor your approach to suit each window's specific needs. There's no requirement to use the same type of glass for every window.

CUSTOMISING NOISE REDUCTION

Achieving the perfect noise reduction for each area of your building is easily attainable by selecting thicker glass panes where needed and opting for specific glass types renowned for their acoustic benefits.

Example Scenarios

- For windows facing a busy street, enhanced soundproofing may be essential, while those overlooking a tranquil backyard may require less intensive treatment.
- To improve the quality of sleep in your bedroom, you can choose thicker glass options tailored to your specific needs.

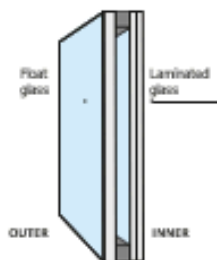


Customising your window insulation allows you to address the unique requirements of each space in your building, ensuring optimal noise reduction and comfort.

PERFORMANCE DATA

The following tables compare the STC/Rw data and Perceived Sound Reduction (PSR) for a range of IGU's. The PSR is a weighted sound reduction comparison that compares the glass performance as a ratio compared to 3mm float glass.

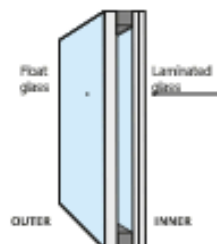
GOOD



Acoustic comparison

Type	Outer Glass (mm)	Air Space (mm)	Inner Glass (mm)	STC*/Rw*	PSR(%)**
	—	—	3mm Float	26	0
The Above data has been included for reference					
IGU	4 Float	6	4 Float	29	15
	4 Float	12	4 Float	30	20
	4 Float	12	5 Float	30	20

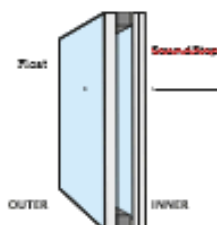
BETTER



Acoustic comparison

Type	Outer Glass (mm)	Air Space (mm)	Inner Glass (mm)	STC*/Rw*	PSR(%)**
	4 Float	6	6.38 Lam	34	40
	6 Float	12	6.38 Lam	35	45
Laminated IGU					

BEST



Acoustic comparison

Type	Outer Glass (mm)	Air Space (mm)	Inner Glass (mm)	STC*/Rw*	PSR(%)**
	4 Float	12	6.5 Lam	38	55
	6 Float	12	8.5 Lam	40	60
Sound Stop IGU					

Note: S = SoundStop uses Acoustic Grade Interlayer

STC: Sound Transmission Class

Rw: Weighted Sound Reduction Index

PSR: Perceived Sound Reduction

S: SoundStop - Acoustic Laminated Glass

GOOD, BETTER, BEST APPROACH

The Good, Better, Best approach simplifies the complexity surrounding the selection of the correct glass to provide the best design solution. Other options not listed here are available from The Thermawood Window Installer.

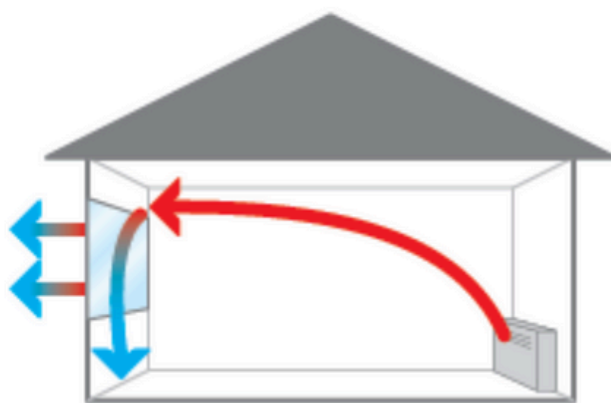
This way, you can customise each room based on the individual room's needs.

Cost Efficiency

There's no reason to pay for thicker glass for an area of your home that isn't subject to noticeable noise pollution. On the other hand, some rooms may require a different type of glass such as laminate or acoustic glass to effectively drown out intense sounds like moving trains or a nearby highway.

ADDITIONAL PRIORITIES

We'll also take into consideration other priorities you may have with your windows such as lowering your energy bills with enhanced thermal insulation and reduced glare or a combination of both.



HEAT LOSS FROM WINDOWS

- › Warm air moves toward cold glass
- › Heat is lost through unprotected glass

MAXIMISE THE POTENTIAL OF YOUR HOME WITH YOUR RETROFIT DOUBLE GLAZING SYSTEM

Our primary objective is to help you make the most of your retrofit double glazing system. This entails tailoring soundproofing to suit each room's unique requirements, all while ensuring that various other crucial objectives are met, including:

⇒ **Insulation - Heat Loss**

Effectively combating heat loss to enhance energy efficiency and indoor comfort.

⇒ **Condensation**

Minimising or eliminating condensation issues, thereby protecting your property from potential damage.

⇒ **Solar Control - Heat Gain**

Regulating solar heat gain to maintain an ideal interior temperature.

⇒ **Glare - Visible Light**

Controlling glare to create a well-lit and comfortable environment.

⇒ **Fading - UV Elimination**

Safeguarding your furnishings and interiors by blocking harmful UV rays.

⇒ **Safety - Human Impact**

Ensuring the safety of occupants by incorporating protective measures.

⇒ **Security**

Enhancing the security of your property to provide peace of mind.

⇒ **Comfort**

Striving to make every room as comfortable as possible, while preserving the original style and character of your windows.

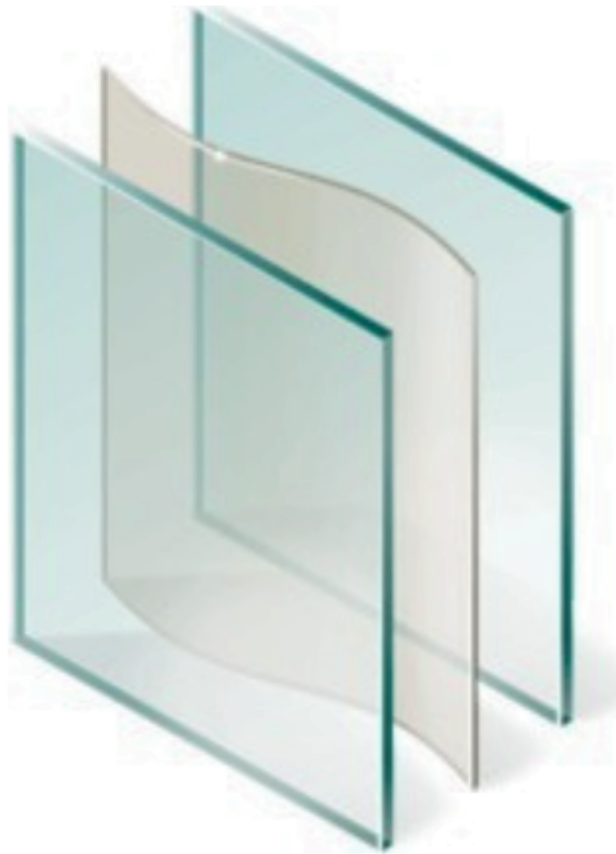
Our aim is to achieve a comprehensive transformation that harmoniously combines these elements, all while maintaining the distinctive style and character of your windows."

08

TYPES OF GLASS

FOR SOUND INSULATION

While double glazing with standard glass can provide a basic level of noise reduction, when your goal is to effectively soundproof a building or home, the key to achieving remarkable results lies in selecting specific types of glass designed to minimise sound. Laminated and specialised acoustic-grade glass are the superior glass choices for comprehensive noise reduction.



Laminated Glass : This glass type is not only more robust than standard glass but also classified as Safety Glass. It features an interlayer positioned between two glass layers, often composed of a clear plastic called polyvinyl butyral (PVB). This PVB interlayer serves multiple purposes, such as preventing the glass from shattering when broken and providing excellent vibration-dampening qualities, making it an excellent choice for soundproofing.

Acoustic Grade Glass : For even more effective soundproofing, acoustic grade glass is a top choice. When combined with acoustic seals, it can significantly reduce noise levels. Acoustic glass comprises two glass sheets with a layer of acoustic resin in between.

Acoustic glass is available to offer superior sound reduction.

BENEFITS OF RETROFIT DOUBLE GLAZING

With retrofit double glazing using laminated or acoustic grade glass, you'll benefit from a dynamic combination of features working in unison to block out sound waves, including:

- Two glass panes
- Acoustic seals
- An interlayer between glass sheets for each pane (PVB for laminated and acoustic resin for acoustic grade glass).



These specialised glass options ensure an exceptional level of noise reduction to create a more peaceful and serene living environment.

09

IS LAMINATED OR ACOUSTIC GLASS

BETTER FOR SOUNDPROOFING?

Enhance Your Acoustic Environment with the Right Glass Solution!

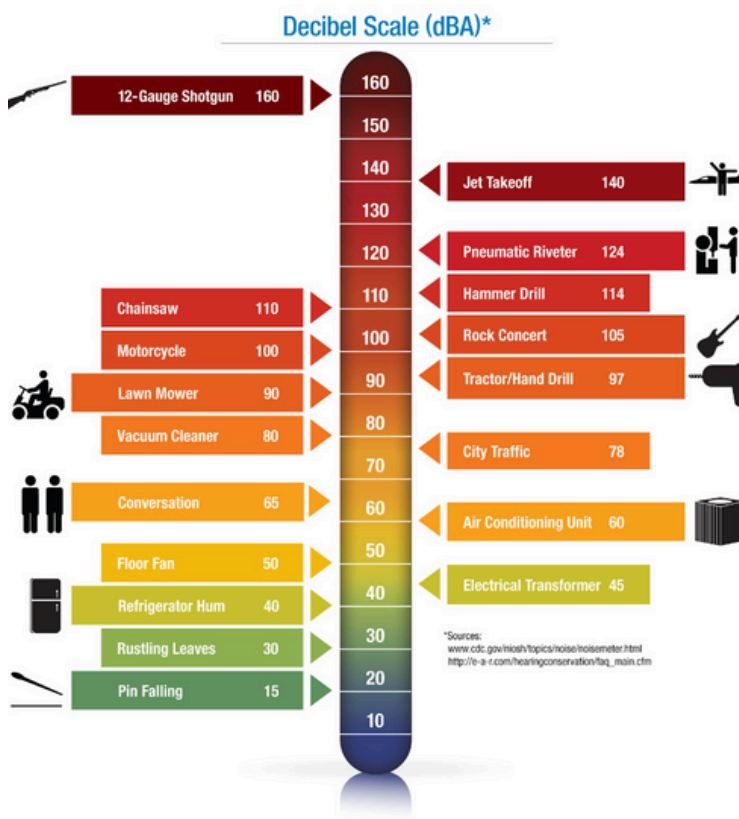
When it comes to soundproofing, choosing the right glass is crucial. While acoustic glass is often hailed as the most effective for reducing noise, the decibel difference between standard laminated and acoustic glass might not be immediately apparent to the human ear.

CONSIDERATIONS FOR SOUNDPROOFING

Research suggests that a minimum three-decibel gap is needed for noticeable sound differentiation. Considering the cost disparity between the two, standard laminated glass is frequently chosen for soundproofing applications.

Cost-Effectiveness

The choice between them depends on the nature of your noise disturbance. For typical street noise and traffic, standard laminated glass should suffice.



Superior Sound Dampening

However, if you contend with more formidable sounds like trains or airport proximity, investing in thicker acoustic-grade glass is recommended for comprehensive acoustic dampening.

HOLISTIC APPROACH TO SOUNDPROOFING

Keep in mind that sound infiltration isn't limited to windows; doors and walls play a significant role too. Even with top-notch acoustic glass in a retrofitted double-glazed system, it's essential to view the building as a holistic soundproofing solution.

Considerations Beyond Glass

Consider converting glass doors to enhance your property's acoustics or upgrading to wooden doors. Wood, with its natural soundproofing properties, converts sound energy into heat through friction and viscous resistance, offering superior acoustic dampening compared to aluminium or synthetic alternatives.



WOODEN DOORS



ALUMINIUM DOORS

COMPREHENSIVE SOUNDPROOFING

Remember, addressing the overall building envelope is crucial. Overlooked factors such as open vents on the roof or exterior may permit unwanted external sounds. Take a comprehensive approach to ensure your space remains a haven of tranquillity amidst the noise of the outside world.

10

SOUND INSULATION

FOR SASH OR DOUBLE HUNG WINDOWS

PRESERVING HERITAGE WINDOWS

A Sound Insulation Solution with Precision and Respect



When it comes to heritage windows, achieving sound insulation demands a delicate touch, skillful craftsmanship, and utmost respect for the original window structure. Many older and traditionally-styled properties, including Regency, Victorian, and Georgian homes, feature sash windows. These windows, characterised by sliding window frames that can be opened at various points, rely on a counterbalancing cast weight known as a sash weight.

PRESERVATION CHALLENGES

Preserving the dynamic interplay of sash weights is crucial to maintaining the authenticity of these windows. This unique challenge sets heritage windows apart from more modern alternatives, making secondary glazing and new double-glazed windows less suitable for soundproofing.

Secondary Glazing Challenges

Secondary glazing, for instance, poses difficulties in rebalancing the sash weight due to the disruption caused by the acrylic sheet.

New Double-Glazed Windows Challenges

On the other hand, new double-glazed windows necessitate the removal of the entire original window, compromising both the window's historic character and the property's aesthetic.

THE THERMAWOOD SOLUTION

Enter Thermawood's retrofit double glazing system, the optimal solution for soundproofing sash and double-hung windows while preserving their original charm. This innovative system reweights the windows, restoring their original functionality. Thermawood employs a specialised process for acoustic sealing, ensuring a comprehensive approach to sound insulation.

With our extensive experience in soundproofing heritage windows, we have honed the ability to identify key areas where noise and draughts may infiltrate sash windows. Our targeted approach involves the use of acoustic and draught seals in strategic locations.

Acoustic Sealing Process

Acoustic seals and mohair are applied along the sides to eliminate rattles and draughts around the sash. For the parting rail, underneath the sash, and around the staff bead on the inside of the frame, we utilize an acoustic siding seal.

METICULOUS CARE FOR HERITAGE WINDOWS

Through this meticulous care for heritage windows and the implementation of our unique retrofit system, we achieve fully sound-insulated windows that stand the test of time, maintaining the century-old charm, beauty, and integrity of the original windows.



11

OTHER THINGS YOU DIDN'T KNOW ABOUT REDUCING NOISE

IN A HOME OR BUILDING

DISPELLING A COMMON MISCONCEPTION

Triple Glazing and Acoustic Benefits

A prevailing misconception suggests that achieving significant acoustic benefits requires the use of triple glazing. However, this notion is not entirely accurate. Triple glazing is primarily designed for extreme cold environments, emphasising insulation against heat loss and prevention of heat gain.

CONSIDERATIONS

It's important to note that triple glazing entails a thicker window frame to accommodate the three panes of glass. While effective in certain contexts, it can be considered excessive for most buildings, potentially compromising the character and charm of your home.

More significantly, the acoustic advantages it offers over double glazing may not be substantial enough to warrant sacrificing the aesthetic appeal of your living space.



ALTERNATIVE STRATEGIES FOR NOISE REDUCTION

In addition to window solutions, there are other effective strategies for reducing noise in a home or building.

Soundproofing Materials

- Utilizing soundproofing materials such as acoustic panels or curtains can significantly reduce noise transmission within a space.

Sealing Gaps and Cracks

- Sealing gaps and cracks around doors, windows, and walls can prevent noise infiltration from the outside.

Landscaping

- Strategically planting trees or installing noise barriers in outdoor spaces can help mitigate external noise sources.

CONCLUSION

While triple glazing may offer certain advantages in extreme climates, it is not always the most practical or aesthetically pleasing solution for noise reduction. By exploring alternative strategies and understanding the specific needs of your space, you can effectively create a quieter and more comfortable environment without compromising on style or functionality.

12

THE BEST WAY TO INSULATE A WINDOW FOR SOUND

WHILE RETAINING CHARACTER

PRESERVING YOUR HOME'S CHARM

High-Performance Windows without Compromise



There's a common assumption among property owners that reaping the benefits of high-performance windows necessitates sacrificing the authenticity of their period home. However, this misconception shouldn't hinder you from enjoying the acoustic advantages you've always desired. With Thermawood's patented retrofit double glazing system, achieving a serene and peaceful environment is not only attainable but also affordable.

In our modern world, noise pollution has become an accepted part of daily life. Yet, there's no need to endure the annoyance, disturbances, or the adverse impact on our well-being any longer. It's time to rediscover tranquillity without compromising the authentic charm of your home.

READY TO EXPERIENCE THE THERMAWOOD DIFFERENCE?

Contact us today for more information on
transforming your windows for a better tomorrow.

bit.ly/GetThermawood-NZ

