



THE ULTIMATE WINDOW INSULATION GUIDE

HOW TO KEEP THE HEAT IN OR OUT

HOW TO KEEP

THE HEAT IN OR OUT

Whether you're dealing with cold draughts, the sun overheating your home, or both, your windows are where most of the heat transfer happens, which makes them your home's biggest thermal weak spot.

Instead of letting heat escape in the cold weather or turning your home into an oven in summer, the right double glazing keeps the warmth in when you want it and out when you don't. These days both builders and homeowners are moving to double glazed windows, because more people understand just how big the energy efficiency gains are, and how much more comfortable a home or workspace becomes.

Installing windows with a single pane of glass no longer makes sense. It wastes energy, turns heating and cooling into an unnecessary cost, and adds to your carbon footprint. It also leaves you exposed to problems like ongoing noise, and makes keeping your home comfortable a constant battle.

Modern double glazing has completely changed what our windows can do. With double glazed windows tailored to your home, you get:

1. A comfortable home all year round.
2. Energy bills that are a fraction of what they used to be.
3. The satisfaction of getting the best from your windows, instead of losing money and comfort because they can't keep up with what we expect today.

So how does double glazing handle both hot and cold weather, and what options do you have for insulating your windows? Are there any DIY alternatives that help insulate a home?

There are plenty of ways to insulate windows, but they're not all equal. The best method isn't always the most expensive one, it's the one that makes the most sense.

Here are the facts on window insulation: why double glazing works so well, the science behind Low-E glass, and a proper look at your options for getting the best value from your windows.



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01

DIY WINDOW INSULATION CONSIDERATIONS

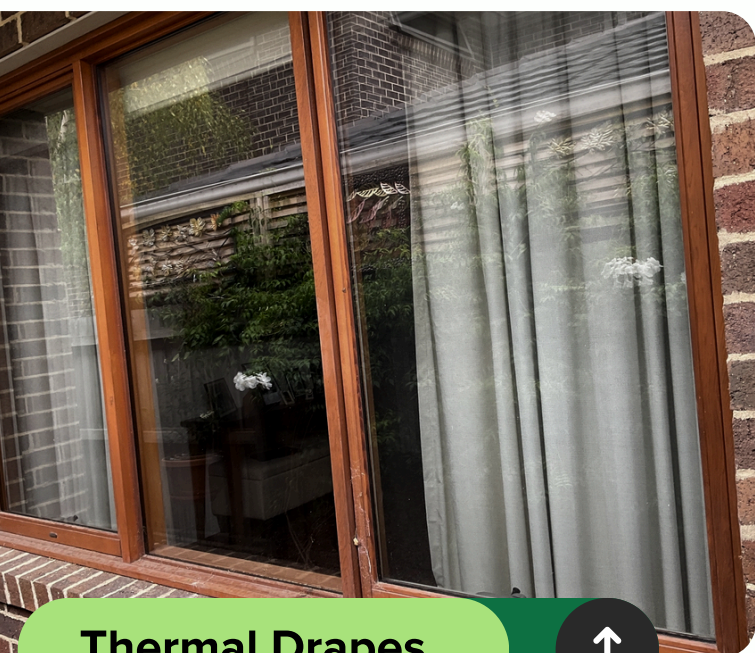
There are a few ways to insulate your windows, and each one gives you a different level of protection against heat and cold.

WINDOW DRESSINGS FOR INSULATION

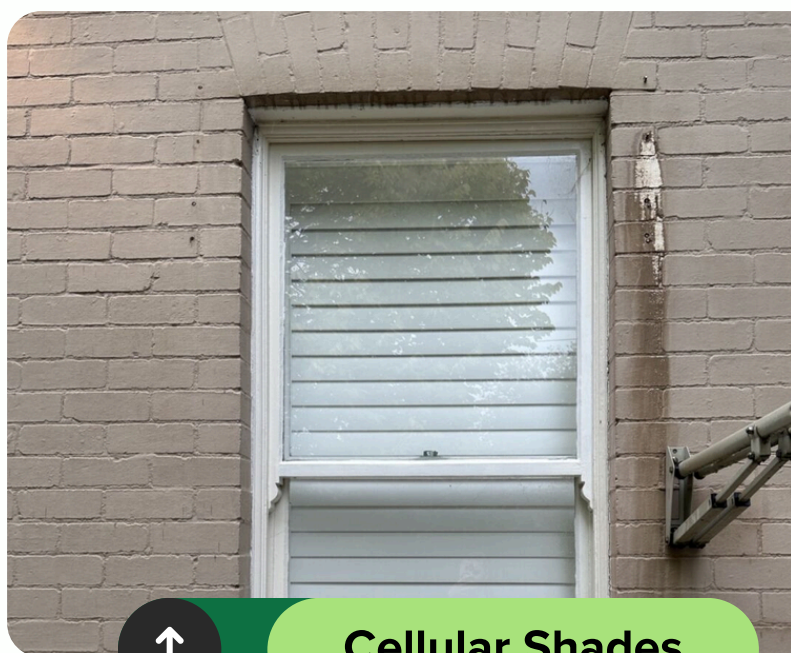
One of the easiest DIY methods is putting up window dressings that insulate better than standard curtains and blinds.

Types of Window Dressings

- Thermal Drapes: these curtains add extra insulation by trapping air around your windows.
- Cellular Shades: also called honeycomb shades, these have pockets that trap air. Double or triple cell shades insulate even better.



Thermal Drapes



Cellular Shades

Combining Window Dressings

Combining different window dressings can improve the result, like pairing thermal curtains with cellular shades.

Limitations of Window Dressings

The catch is that window dressings can't do anything about draughts, so you'll still get cold air coming in and heat escaping. In warmer climates the shading helps, but not by much, and you risk trapping too much heat and making overheating worse if you're not careful. You also have to keep the curtains, blinds or shades closed to get even that bit of insulation, which means giving up the natural light that makes having windows worthwhile.



SEALING WINDOWS

Another DIY method is sealing your windows with caulking around the casings and weather stripping around the sash. This closes off air leaks and cuts heat loss.

INSULATING WINDOW FILM

Another option is applying an insulating window film directly to the inside of your windows, creating an air gap that reduces heat transfer.

Low-Emissivity (Low-E) Film

Low-emissivity (Low-E) film can also turn your existing window into a sort of Low-E product, reflecting heat back into the room.



CONCLUSION

DIY methods all help a little, but keep in mind you won't get a big difference from them, even if you combine the lot. You're usually better off putting that time and money into a professional job that sorts out your windows' thermal weak spots once and for all.

02

WHY DOUBLE GLAZING MAKES **A MAJOR DIFFERENCE**

You can feel the difference double glazed windows make, and you'll see it on your energy bills. A few things make double glazing so effective:

1. **Customizable Air Gap** : double glazing creates a customisable air gap that cuts down heat transfer.
2. **Enhanced Insulation** : two panes of glass block out cold air, heat and noise, and keep warm air inside through winter.
3. **Professional Installation**: a professional fits an Insulated Glass Unit (IGU) in place of your single pane. That means you're not trying to patch up poor glass, you're using better glass, like thermal glass, that's made to manage your indoor temperature.

STRUCTURE OF AN IGU

An IGU is two panes of glass plus an air gap. Both the glass and the air gap can be tailored to the insulation needs of each window in your home.

CUSTOMIZATION FOR OPTIMAL INSULATION

So you can choose thermal glass for those sun-drenched north and west-facing windows that overheat, and a tailored IGU for your south-facing side, usually the coldest in winter, and sort out anything else specific to your home.

DYNAMIC THERMAL INSULATION SYSTEM

That's what makes double glazing so powerful: it's not just more material or a makeshift air gap, it's a proper thermal insulation system.

And your options don't stop at double glazing. How the IGU is installed affects both its performance and its price. Double glazed windows can be new or retrofitted. You can get the same tailored IGU either way, but the results can be very different.

03

ADVANTAGES OF THERMAWOOD RETROFIT DOUBLE GLAZING

When you upgrade your windows with double glazing, there are two ways to go about it:

1. NEW DOUBLE GLAZED WINDOWS

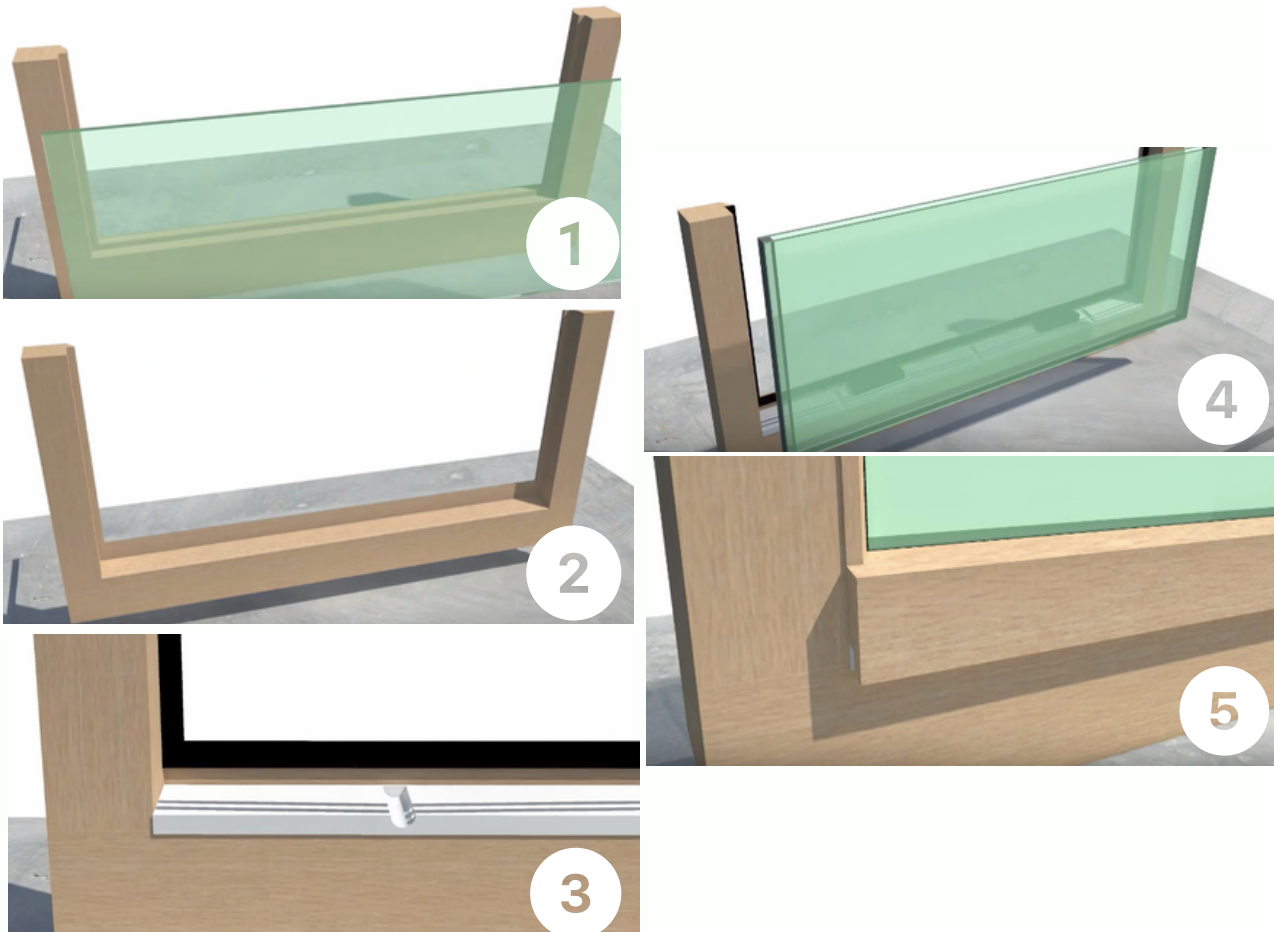
Your existing window, glass and frame and all, is taken out. A new frame and Insulated Glass Unit (IGU) are installed to give you double glazing.

2. THERMAWOOD'S PATENTED RETROFIT DOUBLE GLAZING

Innovative Process

1. This one focuses on **converting** your existing windows rather than replacing the lot.
2. It only works on timber-framed windows.

Your wooden window stays where it is, and we swap the single pane for an IGU. It's a more streamlined process that keeps the original character of your windows, and it costs about a third of the price of new double glazed windows, which can add up to thousands of dollars in savings depending on the size of the job.





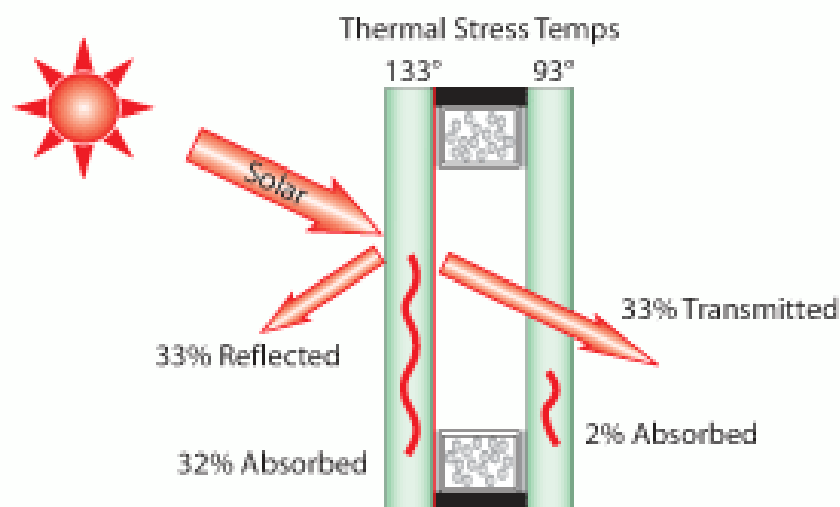
UNIQUE, PATENTED SYSTEM

Thermawood franchisees use a unique, patented dry retrofit double glazing system. It's designed to keep moisture out of the glazing rebate, which reduces the risk of unit failure. That's vital for the life of your insulated glass units and means your Thermawood windows will stand the test of time.

Additional Enhancements

Whether you go with new double glazed windows or the retrofit approach, you can get even more out of them with a special thermal glass called Low-E glass. Low-E is great at holding heat in when you want to stay warm and keeping excess heat out when it's hot, so your home stays comfortable all year.

HIGH PERFORMANCE LOW-E INSULATED GLASS UNIT



Low-E Glass (heat-reflecting glass)

6 mm clear w/SunGuard SuperNeutral 68 outboard / 6mm clear inboard

Tvis = 68% SHGC = 0.38

BENEFITS OF RETROFIT DOUBLE GLAZING

PRESERVATION OF ORIGINAL WINDOWS

Retrofitting keeps your original windows, so you hold onto the look and the historic value of your home.

Very important if your home has a Heritage Overlay.

COST-EFFECTIVE SOLUTION

Retrofitting is generally cheaper than a full window replacement, since it uses your existing window frame.

IMPROVED THERMAL PERFORMANCE

Upgrading to an IGU with Low-E glass sharply improves thermal insulation, which lowers your energy bills and makes your home more comfortable.

MOISTURE REDUCTION

Thermawood's patented system keeps moisture down, protecting your windows from moisture damage and helping them last longer.



BEFORE

AFTER



04

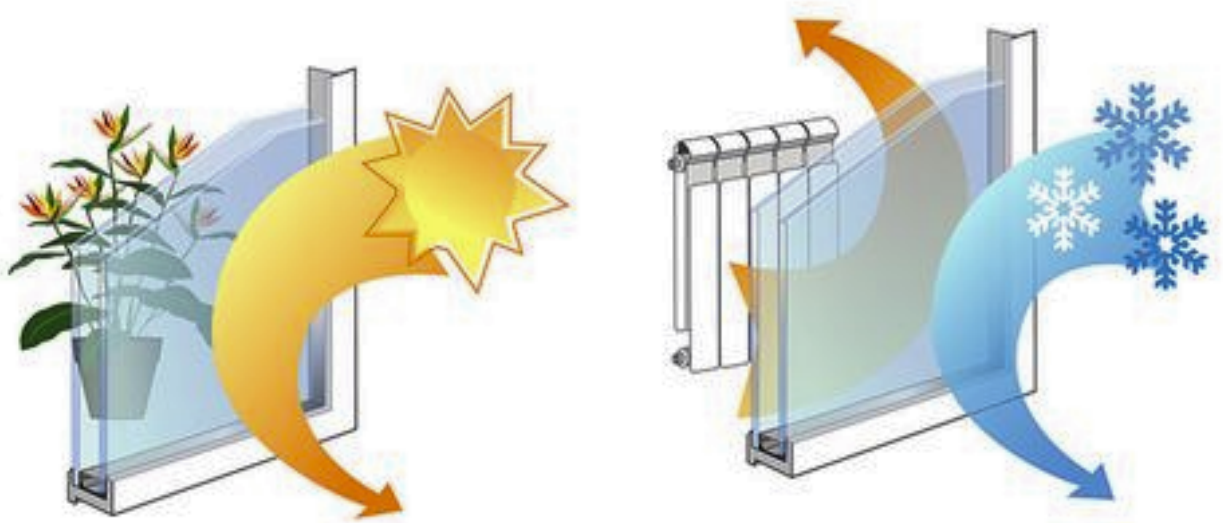
UNVEILING THE SCIENCE

BEHIND LOW-E GLASS

Low-E stands for low emissivity. Emissivity is about how well a surface radiates energy, and for better insulation you want less of it.

UNDERSTANDING EMISSIVITY

Every material radiates some heat. The more reflective a surface is, the more heat it reflects and the less it radiates. Radiant heat is one of the main ways heat moves through windows. In a double glazing unit, Low-E glass bounces the heat back where it came from instead of letting it pass through the glass.



THE COMPOSITION OF LOW-E GLASS

Low-E glass has a micro-thin coating made from layers of silver and other low-E materials. The coating is thinner than a human hair, and like a mirror it reflects infrared light.

For insulation, it reflects short-wave infrared light. That's what keeps a room warmer in winter and cooler in summer: it reflects heat back inside in cold weather, and reflects the sun's heat back out when it's hot.

It's always sending short-wave heat back where it came from.

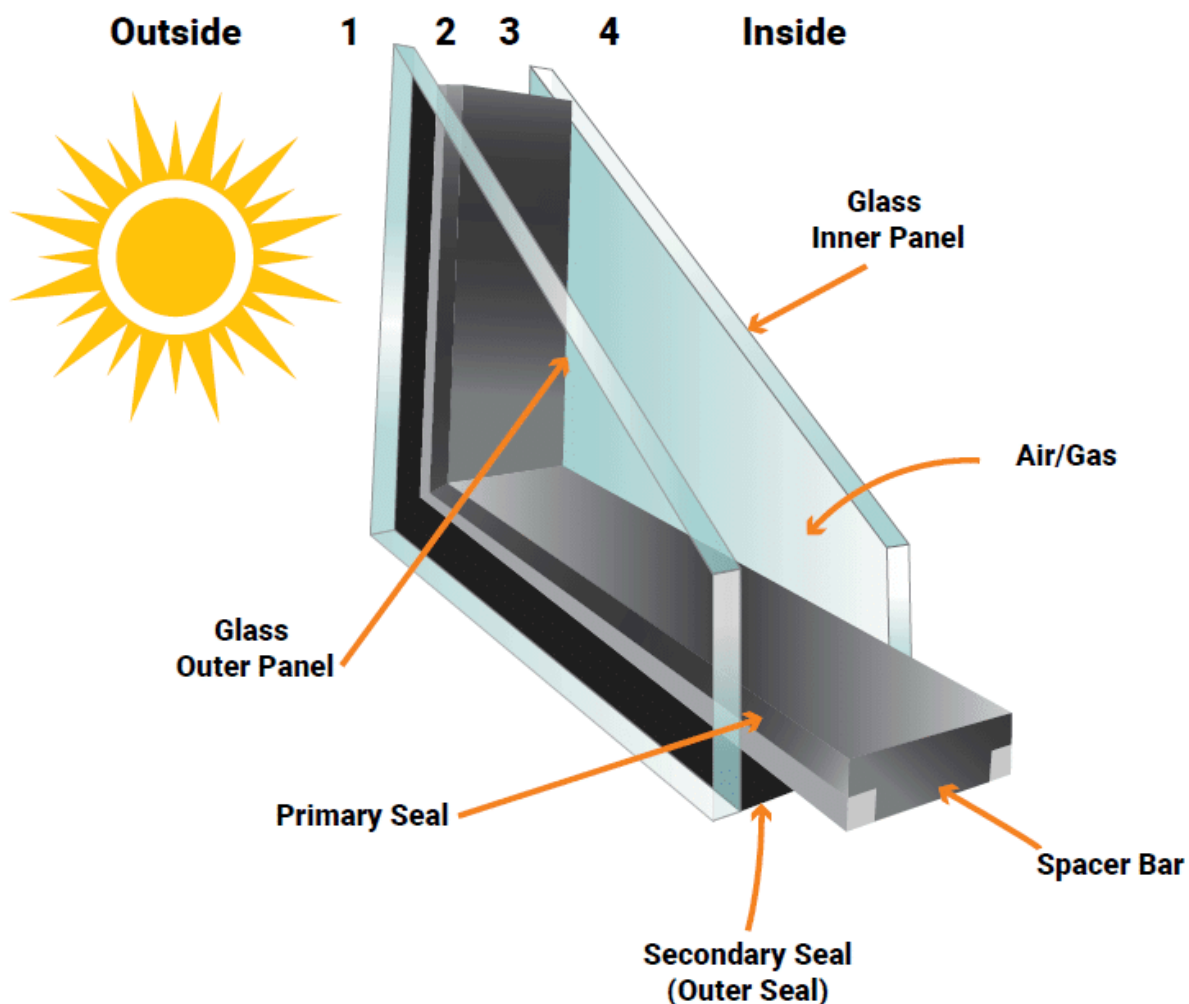
As a result, Low-E glass boosts a building's energy efficiency in both hot and cold climates.

05

LOCATING THE LOW-E
COATING IN AN

INSULATED GLASS UNIT (IGU)

When you use double glazing to insulate your windows, you only need one piece of thermal glass in the IGU. The other pane can be standard glass, or something like acoustic glass. The Low-E coating always sits on one of the two inner surfaces of the IGU: the inner face of the outer pane, or the outer face of the inner pane.



THE STRUCTURE OF AN IGU

Components of an IGU

An Insulated Glass Unit (IGU) is two panes of glass separated by a spacer, with an air or gas-filled gap in between that improves thermal performance. Adding Low-E glass improves the insulation further by reflecting heat.

Positioning of the Low-E Coating

The Low-E coating does most of the work in an IGU, and it goes on one of the two inner surfaces of the unit:

- Inner face of the outer pane: reflects heat back into the room in winter, and reflects outside heat away in summer.
- Outer face of the inner pane: also reflects heat, adding to the overall insulation of the unit.



BENEFITS OF PROPER LOW-E COATING PLACEMENT

Thermal Efficiency

With the Low-E coating on the inner surfaces, the IGU reflects as much heat as possible, keeps your indoor temperature steady, and cuts how much you need to run heating and cooling.

Flexibility in Glass Selection

Since only one pane needs to be thermal glass, you can choose the other pane for something else you need, like acoustic performance. That gives you room to tailor the window to your situation.

CONCLUSION

Where the Low-E coating sits in the IGU makes a real difference to how well a double glazed window insulates. By reflecting heat back, it improves energy efficiency, lowers your energy costs and makes your home more comfortable. Knowing where the coating goes helps you make a good decision when you upgrade your windows.

06

THE IMPACT OF LOW-E GLASS ON VISIBLE LIGHT

A common worry with Low-E glass is visibility. It's easy to assume that if it reflects the sun's energy you won't get the same clarity. That's not the case. Low-E is designed to block infrared and UV rays while letting visible light through.

So there's no noticeable difference in the amount of visible light coming through when you use Low-E soft coat glass.



UNDERSTANDING LOW-E GLASS AND LIGHT TRANSMISSION

Blocking Infrared and UV Rays

Low-E glass is designed to reflect infrared (IR) and ultraviolet (UV) rays, which are responsible for heat gain and interior furnishings' fading. By blocking these wavelengths, Low-E glass helps maintain a comfortable indoor temperature and protects your home's interior without affecting the visible light spectrum.

Maintaining Clarity and Natural Light

Even though it reflects heat, Low-E glass doesn't block visible light. The coating is ultra-thin and clear, so it doesn't change how your windows look or the view outside.

Benefits of Uncompromised Visible Light

1. Natural light: Low-E glass lets plenty of natural light in, keeping your home bright and welcoming.
2. Energy efficiency: by blocking heat-carrying infrared rays, it cuts how much cooling you need, which lowers your energy use and costs.
3. UV protection: it blocks harmful UV rays, preventing fading and damage to furniture, flooring and other interior finishes.

07

DOES THE LOW-E
COATING AFFECT

COLOUR OF THE GLASS?



Modern soft-coat Low-E glass is just as crystal clear as standard glass. Older Low-E technology, known as hard-coat Low-E, had a small downside: in sunlight it looked slightly discoloured. Thanks to advances in Low-E technology, hard-coat Low-E glass is rarely used now.

Tinted glass is often considered for thermal insulation, but it's not ideal for double glazed windows. Part of the glass stays cool while another part heats up, and that uneven temperature can stress the glass and even crack it.

08

**DISTINGUISHING
BETWEEN HARD AND**

SOFT COAT LOW-E GLASS

Hard coat Low-E glass is made through the pyrolytic process. The reflective silver layers go onto the glass ribbon while it's still hot, fusing the coating to the glass and creating a hard coating. It's not used as much today because of the dusty look it gets in sunlight and because it's less effective at blocking infrared energy.

Soft coat Low-E glass is applied after the glass is made and cut. It performs better, giving you the best thermal insulation for hot and moderate climates, and it's what most Low-E glass is today.



09

UNDERSTANDING THE COST OF LOW-E GLASS



The cost of double glazed windows comes down to the type of glass you choose to get the performance you want.

Just one piece of Low-E glass in an IGU can lift a window's insulating power by up to 40%.

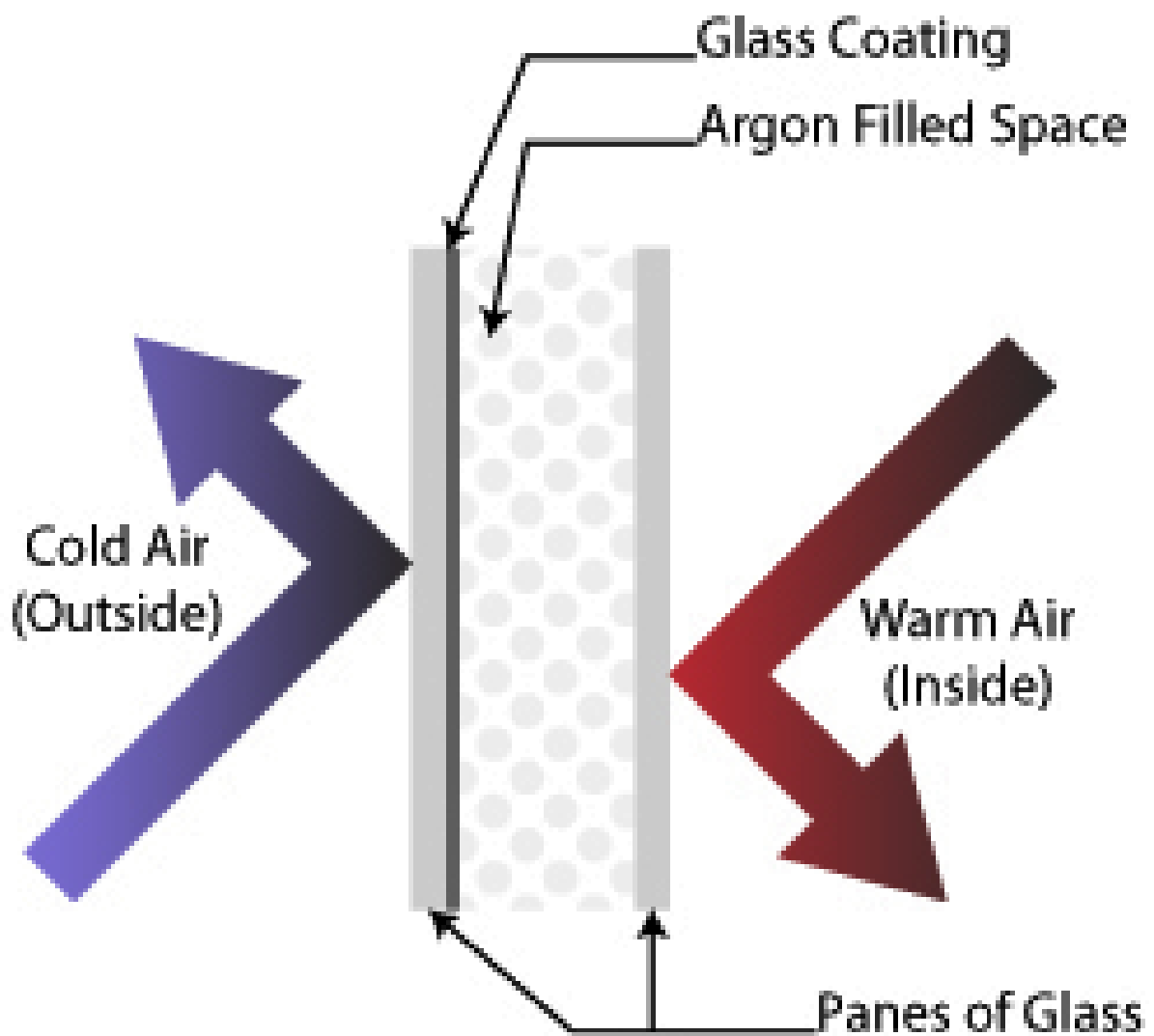
On average, adding Low-E glass raises the overall retrofit cost by 8% to 12%.

Because you get such a big jump in performance for a small increase in price, most people choose Low-E glass when they double glaze their windows.

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TAKING IT A STEP
FURTHER

WITH ARGON GAS



To push an IGU further, argon gas can be added to the air gap for even better insulation. Argon is an inert gas, and it insulates better than dry air because heat moves through it more slowly. Its thermal conductivity is about a third lower than air, which adds roughly another 9% to your window's insulation. Put Low-E glass and argon together and you're close to a 50% boost in insulating power, which makes a real dent in your energy bills.

11

THE ROLE OF

DRAUGHT SEALS



Even with professional double glazing, a Low-E coating and argon gas, you can still get cold air in and warm air out if the window isn't properly sealed.

That's what draught seals are for: blocking cold air and keeping the warmth in. The problem is that not all double glazing installers fit them, and when they do, they often just stick them on, which doesn't work as well.

At Thermawood we machine the draught seals straight into the window before retrofitting, so they work as part of the window. It's this kind of detail that sorts out both the thermal and the acoustic side of your home.

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INSULATING WINDOWS
FOR HERITAGE BUILDINGS

Thermawood retrofit double glazing works on heritage-listed buildings too. You keep your existing timber windows, so you hold onto the original charm and character while bringing their performance up to modern standards. That keeps the look of your home and adds to its value. Thermawood has been approved by Heritage for Grade 1 and State-Listed properties, so it's well suited to heritage buildings.



Experience the Difference

Beautiful windows and proper thermal insulation, at a fraction of the cost of new double glazed windows, have made thousands of homeowners across Australia very happy. The result is modern, efficient comfort, real energy savings, added property value, and a practical answer to sweltering summers and freezing winters. It's a better way to live in your home, and one that's cost-effective, sustainable and built to last.

READY TO EXPERIENCE THE THERMAWOOD DIFFERENCE?

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

bit.ly/GetThermawood-NZ

