

FAQ's on Double Glazing for Heritage Windows

[Fact Sheet]

CAN HERITAGE WINDOWS BE DOUBLE GLAZED?

Yes, 100%.

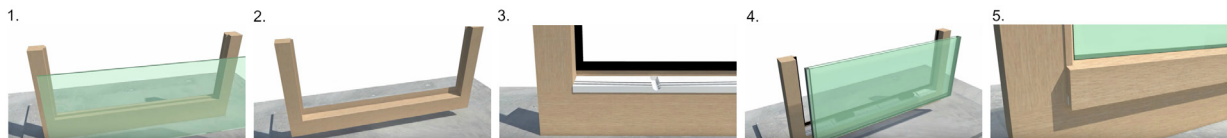
HOW ARE HERITAGE WINDOWS DOUBLE GLAZED?

Using specialised processes and tooling unique to Thermawood a small portion of the external window frame around the single glazed pane of glass is removed leaving a 15-degree slope on the bottom of the frame.

This allows installation of the grand adaptor and patented dry glazing drainage system. Then a specially designed two compound backing seal is fixed to the frame and the blocks that support the insulating glass unit are then positioned on the grand adaptors locating steps.

The double glazed insulating glass unit is placed in the window and the front seal is attached to the beading, the beading is then secured to the frame with the bottom bead specially designed to allow any moisture to escape.

Once complete the unique retrofit process retains all the original character and aesthetics, even the window beads sit at the same angle where the original putty was before. Throughout the process, we will re-weight sash windows, machine in draft seals (nothing is stuck on), and refurbish any area of the window that is needed so that it operates as though it is a brand new window.



WHAT IS THE BIGGEST ISSUE WITH DOUBLE GLAZING IN WOODEN WINDOWS?

If double glazing sits in water for anytime, it's going to fail. The main reason why double glazing will fail is generally improper installation.

By fail, this means fogging inside the double glazing, which is where the edge seal of the double glazing has failed and the only remedy to fix this is replacing the double glazing and sometimes your rotten frame if water has been sitting in the timber rebate and not drained.

In reality, double glazing should last 25 years. However, most people don't understand that double glazing has a 10-year warranty that comes with it. So, it's supposed to last a minimum of 10 years.

Now you don't want to be heading 10 years in as a manufacturer, supplier or as a window company going "whoo-hoo we made warranty; awesome." Imagine if you just bought a house that has 8-year-old double glazing and in two years time you're replacing all your double glazing or potentially your rotten wooden frames because you think the double glazing is new, but you're replacing it because of improper installation and your frames are rotten and your double glazing has failed. You'd be a very unhappy customer.

At Thermawood we are all about increasing the longevity of double glazing in wooden windows such as bringing heritage windows into the 21st century so that they can perform like any new double glazed window would in regards to insulation, noise reduction and the likes while retaining all the original character and able to last another 100 years.

WHAT IS IT ABOUT THERMAWOOD'S RETROFIT DOUBLE GLAZING SYSTEM THAT IS DESIGNED TO INCREASE LONGEVITY?

It's all about full drainage under the double glazing, so if water gets into the glazing rebate (which it inevitably does) it can drain out of the rebate away from the double glazing. This will create longevity in the double glazing and also the timber frame.

When it comes to both timber windows and double glazing, water is the enemy and the Thermawood system is designed to remedy this problem. The thing is a lot of people were and are putting double glazing into a square rebate which leads to rotten windows and failed IGU's.

The main issue is with the polysulphide secondary seal around an IGU. The seal doesn't like sitting in water. Some companies will seal entirely around the unit. So they put the double glazing into a square rebate that they've cut, and they fill it up with silicone all around the unit.

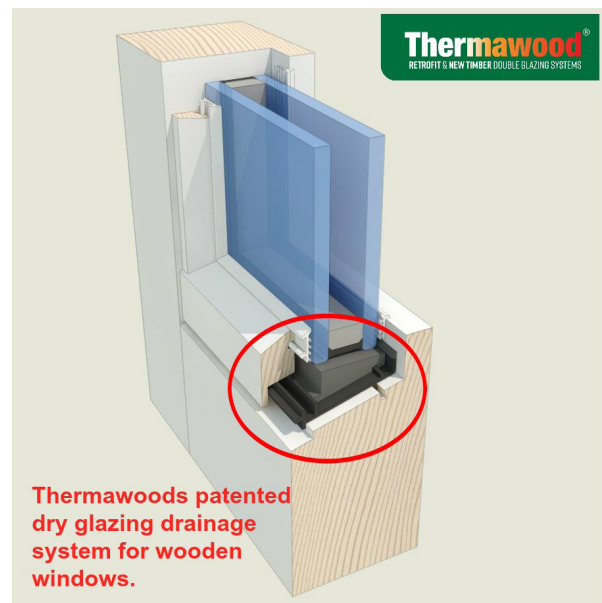
There are a couple of issues with this method:

1. A lot of the silicones aren't compatible with the double glazing because the polysulphide seal is quite particular about what touches it.
2. If there's a gap in the rebate seal and water gets into that gap (which it always does), what happens is it becomes saturated water vapour (when it dries out) and that picks contaminants up out of the silicone. Then the saturated water vapour becomes very concentrated and eats the polysulphide seal on the double glazing causing the double glazing to fail.

So the drainage system we have developed and patented is what we call a dry-glazing system.

There are no seals and no silicones in the rebate apart from a little seal at the end the drainage system (which is compatible with the polysulphide seal) where we seal it against the timber and it is designed so that there is nothing in there that is going to touch the double glazing and cause failure.

We were the first company in New Zealand (where we began) to use silicone setting blocks and now everybody uses silicone setting blocks.



Santoprene which has been commonly used as setting blocks has been proven to have issues with the polysulphide seal and there are probably millions of units in New Zealand sitting on Santoprene let alone Australia as well.

Studies all around the world have shown that Santoprene contaminates the seal and we were the first company in New Zealand to go away from that and use silicone blocks which are made out of a solid silicone and are compatible with an insulated glass unit.

It's the little things like that that make a big difference and unfortunately, the end-user generally doesn't actually understand these things.

HOW DID YOU COME ABOUT DESIGNING THE PATENTED DRAINAGE SYSTEM FOR WOODEN WINDOWS?

For a start, you need to understand that we are industry professionals that have been in the industry for over 30 years. Everything we have designed has come about from industry failures with a need to be better. Thermawood's innovative approach always has best industry practice front of mind.

How we came about is that we would get a call from a joiner/customer. They were good joiners who we respected in the market and they were very good at what they do. I manufactured double glazing for the joiners and they would ring me up and say, "Go fix your double glazing; it's broken down."

By broken down I mean it's fogged up on the inside of the double glazing because a seal has failed drawing moisture inside the double glazing. The only way to fix it is to replace it.

So, we would turn up and look at the window, de-glaze it, pull the beads off the outside of the window and then the double glazing was sitting there on a square rebate with no drainage so no water could run out. In other words, the double glazing had been glazed ineffectively by the joiner because it was sitting in water, and it couldn't escape and the unit had failed.

But because the unit had failed, it was supposedly our fault. We would end up having an argument with the joiner that because of the improper installation as the IGU was sitting in water and it's wasn't our fault. Meanwhile, the customer had broken down double glazing and my relationship with the joiner was strained because my units had failed, but he had glazed them incorrectly. so that was a really horrible circle.

Therefore, when it comes to double glazing and timber windows, water is the enemy. You can't have timber sitting in water and you can't have your double glazing sitting in water. So, us being the end-user, we decided that we needed to have a drainage system for our double glazing and meanwhile there is absolutely nothing around anywhere for it in wooden windows.

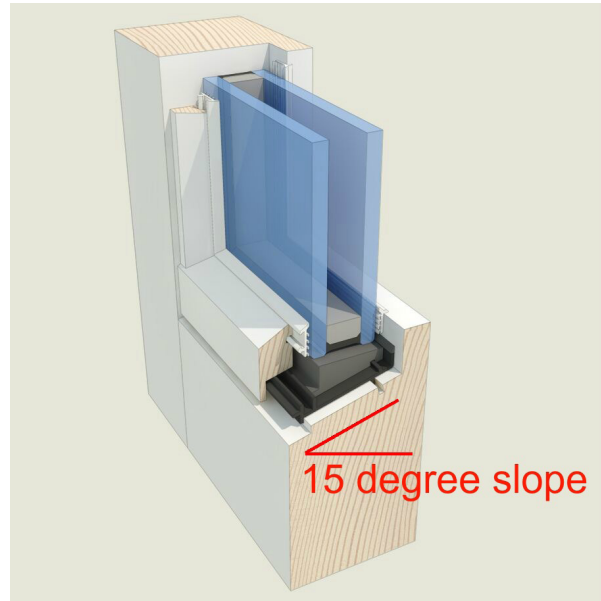
If you look at any aluminium or PVC window they're all designed around drainage so if water gets in, it's got to get out and that's what we have designed with the Thermawood System.

How does the drainage system work exactly?

If water gets in and it's going to happen no matter what you do. You can fully seal the double glazed unit into the rebate, but water will still get in there.

So if water gets in, it has got to get out. Underneath our double glazing, everything sits on a 15-degree slope.

We have the patented Thermawood drainage system underneath the double glazing so that if any water gets inside the glazing rebate it will run down onto the drainage system.



Every 100 millimetres is a drainage slot that will drain out underneath the bottom beading to the outside of the frame/sash.

WAS IT A BIG PROCESS IN DEVELOPING THE DRAINAGE SYSTEM?

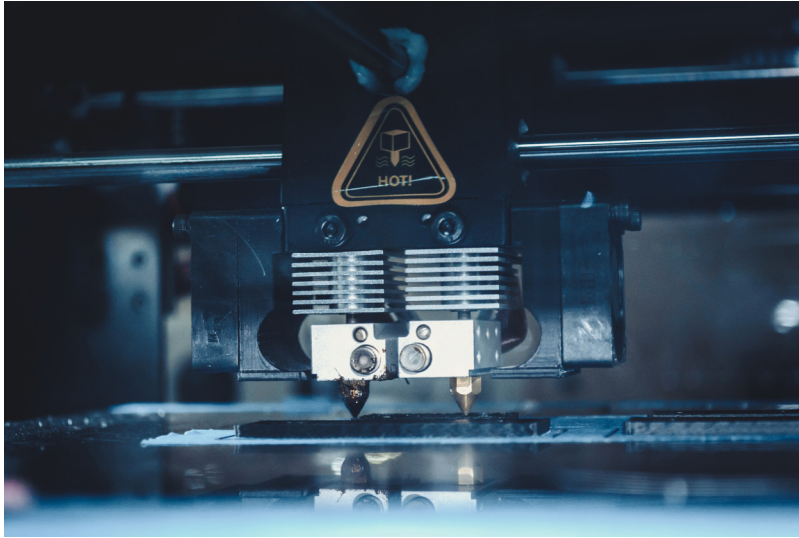
Being the end-user we knew what we wanted when we started designing the system. We were actually very quick at getting it on the market because we knew exactly what we wanted.

Initially, all of our original designs were around retrofitting because we're a glazing company that, along with the new timber windows that we were having problems with, we were retrofitting existing windows as well and we considered ourselves the industry leaders. But competitors were catching up with us. We rebated our frames, we had a 15-degree slope, we put slots in the bead and that was the extent of it at the time.

We had to step it up another notch and that's when we designed our drainage system. It started off when I went and visited a friend that was an architect. He was CAD-based, so we sat down and I actually drew what I wanted on a bit of paper. It was actually on the back of a pie packet in a friend's glazing factory. We were all talking about what we needed to do, and I picked up this pie packet and drew it, which is actually now our new timber-drainage system.

This is back in 2008. From there we took the design and drew what we wanted on CAD then my architect friend put us in touch with the business development unit at Otago Polytechnic. They were a standalone business within the Polytechnic and they took the 3-D model we had done on CAD and put it into their system.

They had 3-D printing and back then it was one of those things you had only seen on TV. I didn't actually realise it existed.



It was pretty surreal designing the product and then pushing the print button. You would then be able to hold it and go “Yep, that’ll work” or “ No, it won’t” and we would make changes and after about five prints, we were there, we were done.

The business development unit was amazed because they were part of the design school that had developed things that usually took a couple of years to get right and they were saying “Do you realise that what you guys are doing, normally takes at least two years?” And we did it in three months.

They were blown away. But, because we were the end-user, we knew what we wanted. Development of the Thermawood products has always been continual and even though when are going on 10 years now the development is on-going all the time. We are always developing new products and improving the products we currently use. The same local suppliers make all our products. Something that is very important to Thermawood.

FOR PEOPLE THAT OWN HERITAGE PROPERTIES, WHAT IS THE RANGE OF CHALLENGES THAT THEY HAVE WITH HERITAGE WINDOWS?

In heritage homes, you generally can't touch the windows because they are the heritage part of the building.

They certainly can't put in an aluminium or PVC windows because of how they look. But everything we do is designed with heritage in mind and to be seamless so you're don't see what we do.

When we're finished retrofitting heritage windows and doing what we do, you really don't know we've been there.

- Our beads are on the same angle as the old putty.
- When we rebate the frame to put the double glazed unit in, the angle of the beads sits at exactly the same place as where the old putty was on the same angle.
- Our system is all incorporated into the window it's not an add-on and it's not secondary glazing.
- It's a proper-sealed double-glazed insulated glass unit inside the heritage window.

Heritage property owners might just do a renovation on the inside of the property keeping the whole outside of the structure. But depending on budget and as long as they keep the front of the building some will rip the whole backend of the house off and build a big extension out the back. But they've got to keep those front rooms where they are.



Just like The Block when they did a heritage line in a row of about four or five heritage homes. They basically ripped the whole back of the houses off and left the two front rooms there because they had to due to the heritage overlay.

This is a prime situation where we can bring those old heritage windows into the 21st century to perform just as a new window with double glazing would. Including noise reduction, insulation and draft proofing as well. Another example of our continued development is that we can also automate your double hung windows to operate remotely as part of your home automation.

ARE THERE CASES WHERE PEOPLE ACTUALLY OWN PROPERTY AND DON'T REALISE THAT IT'S A HERITAGE-LISTED PROPERTY?

Probably. And that's where it can go wrong if they do something they shouldn't do.

We are currently the only company doing what we do and a lot of people don't know that what we do is possible, so it's like we're selling a secret.

We've had people come up to our stand at Home Shows and say "Oh, my god! We've been told that what you do, can't be done". So it's getting the word out there and letting people know that what we do, can be done.

BEFORE THERMAWOOD'S RETROFIT DOUBLE GLAZING WAS AVAILABLE, WHAT WERE PEOPLE DOING WITH THEIR HERITAGE WINDOWS?

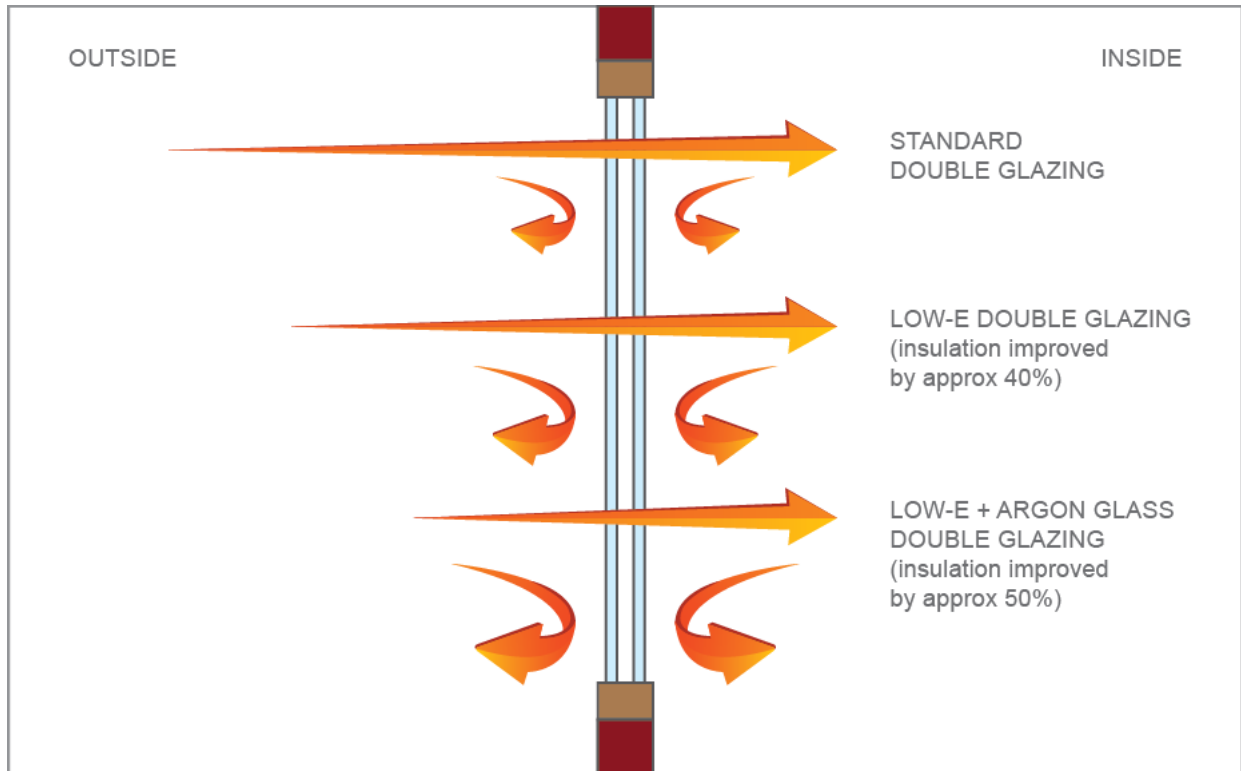
- Some put draft seals in. That does help with insulation because it gets rid of the drafts.
- Others put secondary glazing on, but secondary glazing is generally pretty ugly.
- Then there are homeowners that use double windows, where a secondary window is put in.

We've pulled a lot of these products out to put ours in and although a secondary window will give you great acoustic insulation, we achieve the same noise reduction with retrofit double glazing that has acoustic glass. Ending up with the same acoustic results and a heritage window that looks the same as it did originally.

WHAT IS A COMMON PROBLEM WITH HERITAGE WINDOWS?

Noise is a big issue.

We often get asked what we can use for noise and that's where we use the acoustic glass.



Quite often heritage properties are built back to front, so insulation is a big issue as well.

If there are a lot of windows facing south you might have noise issues and insulation issues.

We can incorporate a Low-E glass with argon gas and acoustic glass all within the same unit. Then it is properly insulated and the noise is reduced.

It's a case of tailoring each individual window. Each room could have a different reason why double glazing is needed. When we turn up to a house it's not just about double glazing a bit of 4mm-on-4mm standard double glazing it's about why are we there.

Is it noise, insulation, security or a combination of them all?

We can tailor the double glazing per room and window throughout the house. So that's where we take the time to go through and assess each window/room with the customer. Including any other problems such as:

- Is noise the main issue
- Do you need better insulation
- Is overheating the main issue
- Drafts
- Do the windows work?
- Will they operate?
- Can we add fly screens?

And we're not going to retrofit a window that's not up to it. If we do, and it falls apart in two week's time, well there's no future in business for us. That's why we do a full assessment of the windows and assess the following as well:

- Is there any rot?
- Is there any evidence of water penetration?
- Is the hardware reusable?
- If not, what are we going to replace it with?
- Is replica heritage hardware available?

We complete a full assessment of the windows and give a duplicate copy to the customer. Our quotes are very robust, they are very open, any extras like hardware, ropes and weights or anything that's an extra, we itemise on our quotes. Then you can see the true costs of it all per room, per item.

ARE YOU ABLE TO SOURCE ORIGINAL HARDWARE IF IT'S MISSING ON A HERITAGE WINDOW?

Yes.

We have a list of heritage hardware we use. Generally with double-hung windows, especially, we have to replace the locks because we need a slim-line lock since we are cutting deeper into the rebate. Therefore we put a new slim-line lock on.



We've got hardware in brass, satin chrome, and all sorts for people to consider when replicating the original window.

Since we cut around the old glass to remove it in one piece, if you've got heritage glass we can preserve that too.

For example:

If you've got leadlights, we take the leadlights out the same way with no damage by cutting around it, removing it and then we give it to a leaded lighter to refurbish and we put it inside the double glazing.

The life of a leadlight once it's been refurbished is 90 years, so it's inside there forever and preserved. All those sorts of things that heritage are interested in we have a solution for. There is pretty much nothing we can't do inside the window.



BEING ABLE TO USE THOSE ORIGINAL MATERIALS IS A HUGE BENEFIT BECAUSE THEY ARE MUCH MORE ROBUST THAN THE MATERIALS THAT ARE USED TODAY, AREN'T THEY?

Correct.

If you look at a heritage window that's 100 to 140 years old, most of the time the timber in there is old growth timber and it's in really good condition.

Unfortunately, there's none of that left around the world today because we've used it all. So it just makes sense to preserve the window and there is no reason why, when we're finished doing what we do, it should last for another 100 years.

WHAT ARE OTHER BENEFITS TO REUSING THE ORIGINAL TIMBER THAN REPLACING THE FRAME WITH NEW TIMBER?

It fits the frame for a start. Fitting a new frame or a new sash into an old hole isn't an easy job.

I'm a joiner by trade, and I hate doing it because things settle, things move, they might be slightly out of square, but it all fits. The original timber has got dings and bangs in it and yes some people might want a perfect window, but the original has got character.

There might be a section of wood that slid past the lock for the last 100 years and it might have a nick in it where it just slid past that lock. Or the colonial bars might have particular look to them and we can take those off and put them back on.

All those little things that when it goes back together, it fits so much better than trying to fit something new into an old hole. It's just hard work, and it doesn't look the same because the other stuff is heritage, and then, this new timber is sitting right beside it.

Even when it's painted up, it looks different from something that's old, even though it's painted beautifully, and it's smooth, and it looks good, you still know it's an older window but it looks great as opposed to a new window that looks too good to be in the old hole.

IS POOR DESIGN AN ISSUE WITH ANY STYLE OF HERITAGE WINDOW, FROM ONE PERIOD TO THE NEXT?

Not really. There are two different types of windows for heritage windows, they're either double-hung or casement windows. The only reason they don't work well is lack of maintenance, normally.

Casements, people generally think that they're twisted because you'll get a gap at the bottom and they'll be drafty.

You can replace that sash with a new sash, and it'll still have the same gap because generally, it's that the house has settled and the frames actually twisted and not the sash.

The way our draft-seals work is that they are all machined into the window (nothing stuck on), so we can pick up those gaps and they'll all disappear.



The same with double-hung windows.

By the time we get to a window, normally, the top window has been painted shut for the last 50 years. We'll get rid of all that paint, scrape it all back and have them operating as they should.

Double-hungs, when they work as they should, work really well. They come down, they close, they should operate really, really well.

Usually, lack of maintenance is the reason why they don't and we fix all that as part of the process.



WHAT OTHER ADVICE CAN YOU PROVIDE AROUND HERITAGE WINDOWS THAT IS VALUABLE FOR YOUR POTENTIAL CUSTOMERS?

Don't wreck them before you know what's available. A bit of a company motto is "Renovate don't detonate the old window."

Educate yourself before you go and rip into your windows. A lot of people are scared of double-hung windows because they don't know how they work properly. They are a very simple window, but you need to understand them and that's where we really do.

In my earlier days, I lived in England for a few years and we would go to a house and we would just rip it to bits. We would send the labourers out the back of the building and they would tear all the plaster off the place and just start trashing the house. My job was the joiner and builder on-site so I would go to the front of the house where the double-hung windows were right up two or three stories and I would pull the double-hungs out, refurbish them and put them back in so they operated beautifully.

During that time, I got to know double-hungs intimately, how they work and everything about them. I've shared all that knowledge with all our franchisees and people just can't believe how good they work after we're finished with them. So that is definitely where people need to get some education before they rip into their windows.

