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## ***'How to best adapt standard softwood and hardwood windows to a fully drained and ventilated, dry-glazed, double-glazed, sealed-unit system'***

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Acknowledgements to Philip A Rougier HND (Building) MPhil MCIOB FBEEng MCI Arb  
for his valuable contribution as editor. Website: <http://www.expertexpert.com>

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**This eBook begins now:**

## **How to best adapt standard softwood and hardwood windows to a fully drained and ventilated, dry-glazed, double-glazed, sealed-unit system**

**I have written this article because I so often get asked about if and when to fit or replace (properly) hermetically sealed units into standard wooden window frames.**

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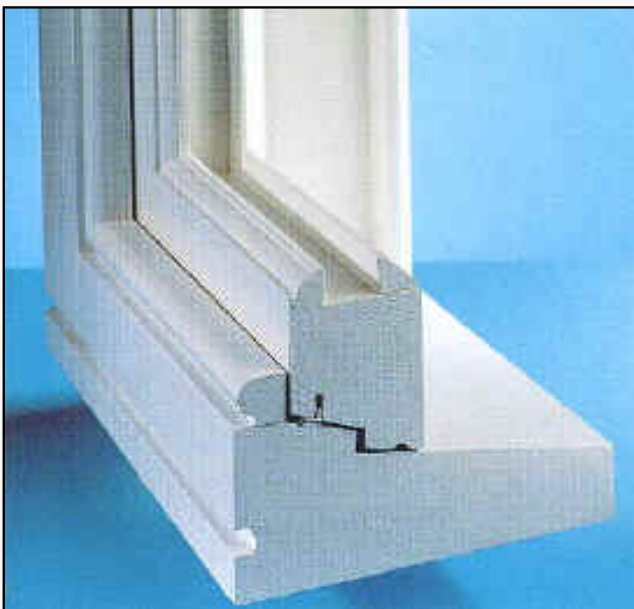
**I am assuming that you are reasonably proficient at DIY and that you understand why sealed units break down prematurely in standard wooden frames in the first place, and quite often in under 6 years.**

**To read up on the causes of such premature failure visit <http://www.double-glazing-web.co.uk> and go through the Sealed Units / Wooden Windows pages.**

Physically a sealed unit (a lot wider back to front than a single pane of glass on its own) can be fitted into the rebate of a wood window of a design that was originally meant to be single-glazed. This is the fundamental problem.

Just because a wider double-glazed sealed unit CAN be fitted into these frames does not mean that it SHOULD.

To do so is to court disaster in the form of inevitable premature failure of the edge seal around the perimeter of the glass unit leading to fogging and misting up between the two panes inside.



**The correct method of fitting double-glazed sealed units into wooden frames properly is a whole new technology, which, in my opinion, is widely misunderstood.**

I am sometimes accused by people in the trade of being plain 'pro plastic' and 'anti wood'. Nothing could be further from the truth. I love the look and warmth of real wood. What I object to, as I have said, is the fitting of hermetically sealed double-glazed units into cheap frames that were only ever designed for single glazing.

In the past, all too often cheap softwood windows were wrongly fitted with double-glazed sealed units, maybe even stained up to look like hardwood. This practice was little short of a con, especially when the windows were guaranteed in new houses for as little as two years.

The problem of premature sealed unit breakdown seems to have arisen out of ignorance, incompetence and cheap practice.

Fortunately the N.H.B.C. has recently banned this method of cheap 'double glazing' in new house builds, and registered N.H.B.C. house builders now need to abide by a whole new set of rules. This unfortunately leaves a great many existing homeowners with an inherent initial design fault, and for them the clock is ticking relentlessly towards sealed-unit failure.

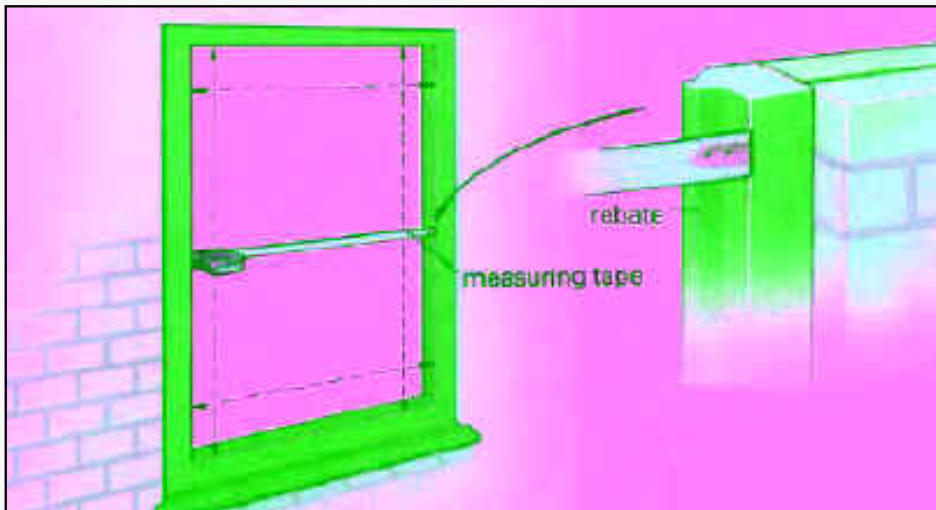
### **I am in that situation, so what are my choices?**

If you are unable to claim under your guarantee from whoever is your supplier, you can do one of three things:

- Remove the old double-glazed sealed units and replace them with single glazing, and maybe fit secondary glazing inside the main frame. This option might also help noise reduction. In such an instance the secondary glazing will need to be fitted preferably at least 70mm away from the main frame, or 100mm if possible would be ideal. If you can only obtain a 50mm gap then don't worry too much, you can still do it this way with good effect.
- Replace the failed sealed units with new ones and install them using the same glazing method as the old ones, but they will almost certainly fail again and probably within the same short time. Not a good idea.
- Modify and adapt the existing frames, with the aim of extending the life expectancy of new sealed units to that of plastic windows, i.e. a fully drained and ventilated dry-glazed system and you could get a great many years of good service from the new sealed units, and almost as would be expected in PVCU plastic windows.

### **What follows now covers the last option in detail, with two ways of doing it.**

- Take w + h measurements of the framework that the actual glass fits into, which is bigger than the visible glass area, and to the edge of the beading where it meets the main part of the framework into which the glass is fitted. Measure at a couple of different points to find the smallest measurement, which is the one you need.



- Next, deduct 10mm, and write down that new measurement. This smaller size is needed to give the new sealed unit a 5mm gap either side of the width and at the top and bottom between the glass and the wood, which will allow for the necessary ventilation gap all around the sealed unit.
- Make a note of this smaller measurement and do not confuse it with the larger measurement.
- First ascertain the overall thickness of the existing sealed units. Then order one new double-glazed sealed unit from a local sealed-unit manufacturer to the same thickness and to the smaller size you have just measured. (Do NOT buy from a normal double-glazing company – look up 'Glass – sealed-unit manufacturers' in the phone book).

Make sure that the first one you attempt is of an easily manageable size. Just do one replacement at first as a 'dummy run' and in a position that is easily accessible, as mistakes can be very costly and you will be very disappointed if it does not all go according to plan, so don't be over ambitious to start with.

### What to do next:

- Now go back to our larger measurement of the w + h. You need to source new beading of the same depth, but with a minimum height of 20 mm (if possible), or 18mm minimum. Buy sufficient to go all around the perimeter. The best way to mitre the corners is to use a hand mitre saw, which you can buy for only £15 or so from your local DIY shed or online at [Screwfix Direct](#) for next day delivery, and this will be a good investment especially as this type of saw is great for precision straight cuts as well as angles.
- Your biggest challenge will be to find and obtain the correct double-sided sticky foam tape that you will use to seal the glass to the wood, inside and out. There may be sources online and you could try a search, or look up 'ALFAS' and ask them who their local trade customer is who then may sell you what you need. There are a large number of different size tapes made so be sure to judge and decide your ideal thickness and height of tape as most suitable to the characteristics of your make of windows. I am not sure if [Screwfix Direct](#) do the tapes, but you could try.

**IMPORTANT:** When fitting the double-sided tape make **ABSOLUTELY** sure that you do not cut the corners short, otherwise you are inviting water to get past at that point and into and around the edge of the sealed unit.

### How to remove the old sealed unit and prepare the frame:

- Remove the old beading using a sharp wood chisel at least 25mm wide, and prise the beading away from the frame. Usually only short pins fix the beads, but the original putty might have gone hard. Do not worry about damaging the beads themselves, as you will be replacing them, but take care not to dent or damage the main framework.



- The old sealed unit may be fully bedded in dried-out putty. If so, go indoors and 'pat' the sealed unit around the edges until it becomes loose or free. Have a person outdoors assist with a gloved palm in the middle of the glass to ensure that it does not crash out suddenly.
- Once the old glass has been removed you will need to invest some time in removing all the old putty and sealant so that the exposed rebate is tidied up to as near as possible the original state. You can buy an electric wood chisel and a good and reasonably priced one is made by Bosch, and it comes with several attachments. You might be able to buy one of these at your local diy shop or you can order one online for next day delivery from [Screwfix direct](#) and I think they might do a cheaper alternative to Bosch as well.
- Most important is to **PRIME** the exposed wood in the rebate. Use a proprietary wood stain for this, the best one you can

afford.

If you wondering why I plug Screwfix Direct it is because I have genuinely found that they have the most comprehensive stocks of just about everything for trade and diy, they sell at most reasonable or even really cheap prices and do a next day delivery and you guessed right: I get a little commission yes, not much but it helps with my costs, and I made this article FREE, so please try them out as your source for stuff. I buy from them myself and I find them so convenient, safe and secure ordering online at their website. I recon they are great, and I've never had any problems with them. In case you are wondering: yes, I really DO buy stuff from them myself (the last thing I bought was a new electric shower, and the price was miles under that of my local DIY superstore, true).

**Now you have to decide whether to make the ventilation and drainage facilities by either:  
(A) drilling through the underside of the sill to the lower glazing rebate OR (B) modify the beads.**

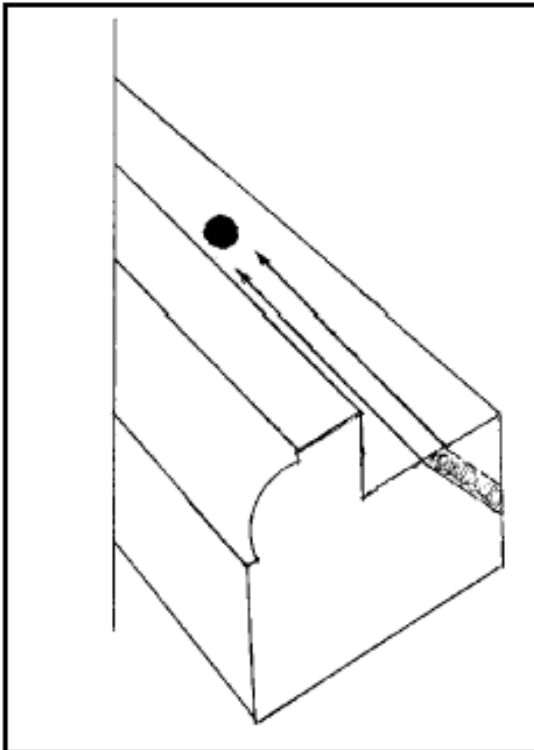
### **How to modify the frame bottom to facilitate perimeter ventilation and drainage:**

Note that what we are trying to achieve is:

- Drainage water holes in the bottom of the frame directly under where the sealed unit sits. Some water will inevitably penetrate past the beading and through any gaps in the frame joints into the edge of the glass. Water will naturally run downwards and you will need the drainage holes to enable it to escape.
- A means of ventilation to the perimeter of the sides and top of the glass edge as well, preferably a nominal 5mm gap all the way round.

### **Method A - Drilling through the underside of the bottom frame to the lower glazing rebate.**

This illustration shows you how and where to drill through from indoors to outdoors at such an angle to achieve the required drainage holes.



(Not to scale)

Drill 6mm (better still 8mm) diameter holes down through the lower rebate from indoors to outdoors at an angle of 25-45 degrees (depending how thick the bottom rail is and where, cosmetically, you want the drainage holes to emerge on the outer face of the bottom rail). Don't worry about a little damage to the topmost part of the rebate during drilling, as it will be concealed. However, the outlet holes must be cleanly drilled and at the same level if they are to look good.

The number of holes you need depends on window width and whether you choose to modify the bottom beads as well (see 'Method B' below, and although you might need to, it's unlikely in most circumstances that you will decide to combine the two methods). A typical drain/vent area for a IG unit 1 metre wide is around 360sq mm, which translates to about 85mm centres for 6mm diameter holes, and 138mm centres for 8mm holes. Positioning of the holes is important. They must avoid the locations of the plastic packing ('setting') blocks that will support the sealed unit off the rebate, whose edge will be 100mm away from the unit's corners. They're typically 75mm long, so there should be no drilling in the 100-175mm zone from each corner. One drilling should be in the 0-100mm zone, and don't forget to make drainage in the middle between the packers.

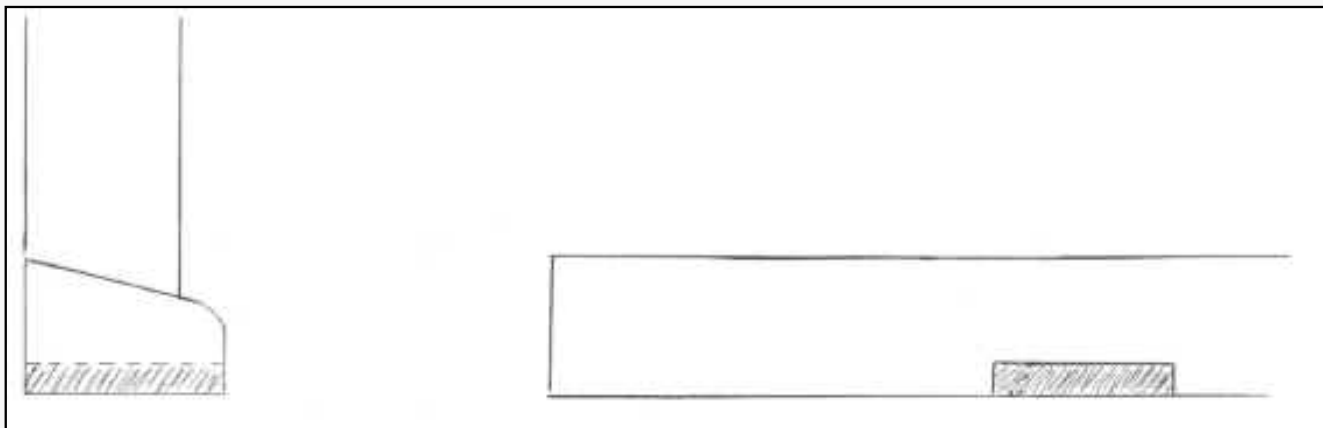
The drainage holes you drill through the frame bottom should be at least 6mm in diameter because water forms globules through surface tension and will not run away out of smaller holes. Even 8mm is not overly excessive, although 6mm is perfectly OK.

You need to consider that a) the wood will suffer as a result of any water passing through the drainage holes, and b) insects might want to 'move in'. For these reasons it is a good idea to line the hole with a plastic or copper tube and fill the tube with fibreglass material or similar (pull a small wad out of the loft and stuff the tube with this). Tip: Find a length of fairly stiff electrical round wire that is the correct diameter and longer than necessary, e.g. wire from a kettle, and use the outer sheath as your liner material. Ensure that it has not become kinked and blocked when you insert it into the drainage hole by testing it and a good tip is to warm it slightly to make it a little floppy, and pull it through rather than trying to push it.

Don't worry too much about a little damage to the topmost part of the rebate you see indoors when you are drilling your drainage holes through from the inside to the outside. The new sealed unit will be smaller than the original, so to make the finished job look good from indoors you will have to 'cloak' the ugly look of the newly visible spacer bar in any case. All you need to do to make the indoors look good is to obtain a small (say 6mm) quadrant or any other shape bead to raise the visible part of the wooden frame, and stain or varnish it to match the original main frame indoors.

### **Method B - Modifying the beads.**

This illustration shows you the end and front view of the bottom bead, and gives you an example of the modification slot necessary for water drainage and ventilation.



Work out slot sizes and placement using the drainage requirement guide above. Typically each slot will be around 25mm long by 4-5mm high and in such a position so as to allow drainage and ventilation past the plastic glazing packers. This means there would be three slots in the bottom bead, one in the centre between the packers, and one each end to the other side of the packers. On large panes an extra hole may be desirable.

## Re-glazing method – fitting the new sealed units in the frame:

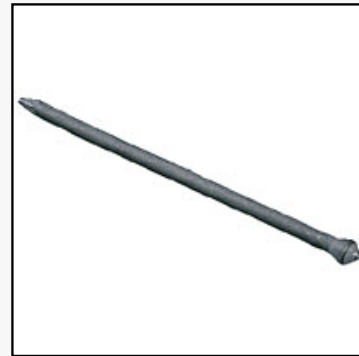
- Ensure that the rebate is well prepared - clean and well primed with wood stain.
- Stick the double-sided tape all around the rebate where it stands up on the inside of the frame.
- Place bridge or flat packers at the bottom of the frame for the glass to sit on.
- Remove the protective tape cover strip off of the double-sided tape on the main frame, and spray the tape generously with water, which will allow some movement before it 'grabs'; this will give you time to position the unit correctly. Don't worry about the water preventing correct and full adhesion - the water will evaporate and full adhesion will be achieved. This is the same method that is used to position and fix self adhesive sign writing lettering on vans.
- Fit the double-sided tape in the same way to the beading up-stand, but do not remove the protective tape just yet. Lift the new sealed unit into position making sure that the packers at the bottom are where you want them, and ensuring that the gap between the glass and wood is as equal as possible at the top, bottom and both sides.
- Now you are ready to fit the beading. It is important to compress the outer bead to maximise the seal as much as possible. Just before you push the bead into place spray the glass or the double-sided sticky tape liberally with water in the same way as you did with the inner tape. Once you have the bead in place, then drive your pins in to hold it there.

I recommend that you use only 'sherardised' panel pins as they will not be liable to rusting.

There are three lengths to choose from: 25mm, 30mm and 40mm. The length most commonly used is 30mm.

You easily can order the right ones online for next day delivery:

[Click here and select 'nails' from the menu.](#)



## A trick of the trade:

To prevent the pins from splitting the wood, blunt them first. You can use a shortcut and do this on site with a tap of the hammer, but I much prefer to offer them up to a file or even a grinder; then the pin will pre-bore its hole rather than split the wood with an otherwise sharp dividing point. Better still drill a small pilot hole through the beading first, and this only needs to be a very tiny hole so that the pin will still grip the beading.

Note the that the new glass unit must be sat on plastic packers, and NOT directly on the bottom of the frame itself, or that would defeat the new drainage/ventilation system. This is MOST important, and be certain to use flat packers of a height of 5mm, and drain not only the corners but also the middle of the bottom of the sealed unit as well. You should be able to obtain suitable plastic glazing block 'packers' from a local supply only cladding or window type of firm, and make sure when you buy that the size front to back matches the overall thickness of your sealed unit, as there are a great many different sizes available.

## Any questions?

Please send any questions you may have and share your window experiences online at my [Q & A double glazing discussion forum](#) (Internet connection required to follow all links highlighted in blue).

**Good luck with your project, and I suggest you visit Screwfix Direct for your Trade and DIY supplies:**

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