

Insulating Aluminium Windows

The Problem

Aluminium windows are great for low maintenance, but they're absolutely terrible for letting heat in and out, with the frames being very thermally conductive as well as the glass. In Winter the warm air inside meets the cold window and the result is usually streams of condensation which can damage the window frames and encourage mould growth.

Most window types are easily double glazed with products such as Duck Window Film, which attaches to the window frame with double sided tape and traps a layer of air against the glass. The timber window frames have a reasonable insulation value and the roughly 10mm thickness of the frame allows an optimal layer of air to be trapped.



With aluminium windows though the frames are too thin, allowing only around 2-3mm of air to be trapped. This is not enough to provide effective insulation and doesn't do anything about the frames conducting heat. We've also heard from some customers that the double sided tape struggles to adhere well to some types of aluminium finish.

The Solution

So what can you do about it, especially if you're in a rental house and can't make any permanent modifications? You can easily build your own frames to fit inside the window reveals which seals off the entire glass and frame!

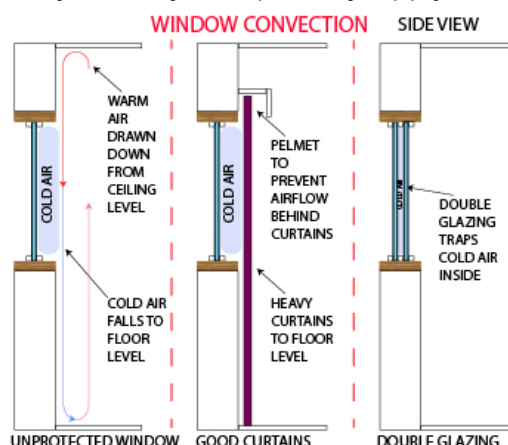
If you're willing to spend a bit more money and effort you could make timber frames and use the Duck window film or even clear acrylic sheets, finishing them to your requirements (e.g. profile with a router, paint, stain, varnish etc). This will greatly improve the appearance of ugly old aluminium frames and provide great insulation value.

A much cheaper and simpler way is to use off-the-shelf components like fly screen framing. They are easy to cut, join and 'glaze' and are quite cheap to buy. A friend of the EnviroShop has put together a great DIY guide on using these frames with clear tablecloth sheeting to insulate the windows of her rental house in Hobart. You could easily apply the same concept using the Duck Window Film, even applying a layer to each side of the frame to triple glaze your windows. The tablecloth material is stronger than the Duck Film but isn't as clear or wrinkle-free. You could use a mix of both around the house, depending on the requirements of each window.

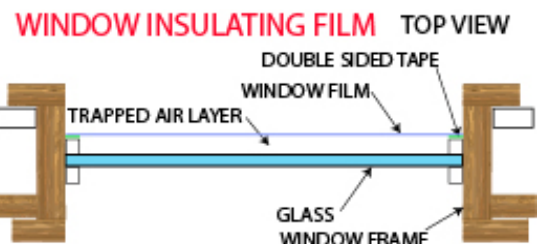
DIY insulating films

Because the insulation value primarily comes from the air, anything that effectively traps the air will work. Common in colder climates but only just appearing here are DIY double glazing films. They are a clear plastic film, similar to cling wrap, which is applied across the window frames using double sided tape. The depth of the frame leaves an air gap, which provides the insulation. If they are applied well they can last several years, but they can be easily damaged and because the film is flexible it provides none of the soundproofing benefits of rigid double glazing.

They are very cheap to buy, apply and remove yourself, so replacing damaged films is not a big deal. Ideal for rentals and people on a budget, we also recommend them to people considering the more expensive options to see how much of a difference double glazing will make.



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FRICION-FITTED 'DOUBLE GLAZING' USING FLY SCREEN FRAME

HOW-TO GUIDE

This how-to guide provides a method for blocking draughts and creating a thermal barrier for aluminium windows using easily accessible materials and tools which is affordable and simple enough to DIY. It is also rental friendly by not using any adhesives or fasteners on the existing dwelling, and able to be easily and quickly removed or modified whenever necessary.

This method uses thin vinyl tablecloth sheeting as a double-glazing layer on the inside of the existing glass window. The vinyl is held firm by being stretched on aluminium framing designed for constructing fly screens. These frames come in 2.5m lengths and can be easily cut to size with a hacksaw. Rubber spline pushed into the frame holds the vinyl in place. Apply a strip of self-adhesive door and window foam seal on the outside of the frame so that if it is carefully constructed to the right dimensions, the framework sits firmly in the window cavity blocking all airflow between the window and the room and trapping a layer of air against the window to help insulate it, just like double glazing.

An alternative method is to apply Window Insulating Film such as Duck brand to the frame. It isn't as strong as the tablecloth material but is more transparent. You can also apply a layer to each side of the frame for even better insulation.

Will work for windows:

- no more than 2.5 metres on their longest side due to fly screen frame size
- no more than 1.3m on their shortest side for vinyl or 1.5m for Duck film
- that have enough depth in the window sill/reveal on the inside to insert the frame

Equipment required:

- A large clean flat surface to work on
- Measuring tape
- Hacksaw
- Mitre box (handy for neat corners, but not vital)
- Vice (not vital)
- Scissors
- Pencil

For vinyl method

- Wooden clothes pegs
- Spline roller (not vital)

For window film method

- Hair dryer

Materials required:

- Aluminium fly screen frames 25mm x 2.5m
- Fly screen frame corner brackets
- Foam self-adhesive door and window seal (a pack usually covers 5m)

For vinyl method

- Rubber fly screen spline 6mm (cheapest when purchased off the roll)
- Clear vinyl tablecloth cover 1mm thickness (available on a roll)

For window film method

- Pack of Duck window insulating film or similar, including double-sided tape

Process:

Estimating and Purchasing

- Carefully measure the window(s) you wish to fit and determine quantities of the materials you will require.
- Don't just add up the total length of fly screen framing and buy that much. Remember that you will be cutting down the 2.5m lengths to fit and you will have some wastage from offcuts. With a bit of sketching and basic maths you can add up the different lengths required to use as much of each 2.5m length as possible, reducing waste.
- If purchasing the vinyl take care that it doesn't touch the floor or any dusty surfaces as it will pick up dust easily. It's easiest to transport when folded very loosely.

Constructing the Frames

- Measure the cavity of your first window at the point where you want the frame to sit, making sure each of the four sides are measured individually. This is particularly important in older houses where window frames may not be square. The ideal position is about 10 - 20mm out from the glass.
- Cut each piece of frame to the required length with a hacksaw and a mitre box, allowing approx 3-4mm gap between the inner edges of the window cavity and the outermost tips of the fly screen frame lengths and cutting the ends at a 45degree angle so that the gutter for the spline is on the inside edge of the frame once constructed.

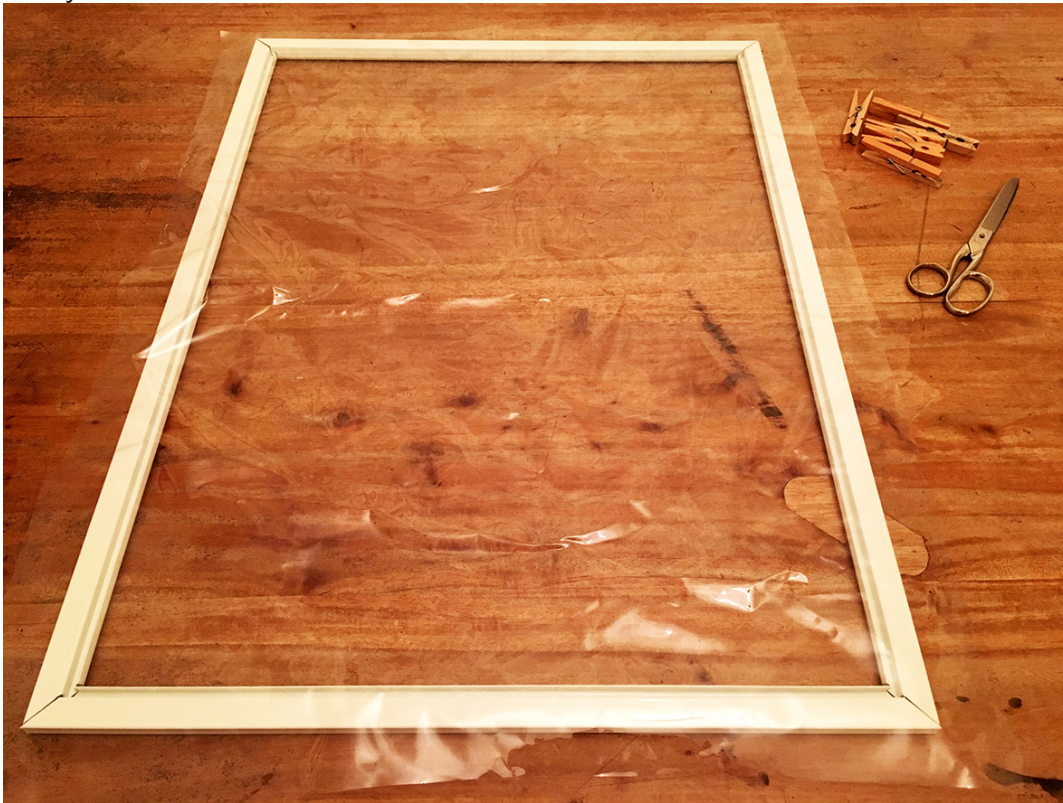


- Assemble with the corner pieces and take it to the window cavity to check how it fits before continuing. It should be able to sit within the cavity without friction, but with no more than a few millimetres clearance between each edge and the window cavity.



A : Fitting the Vinyl Sheet

- Clean up your work surface, or move to a clean one. The vinyl is static and will attract dust very easily but is hard to clean.



- Lay your frame down flat with the spline gutter facing upwards. Lay your vinyl on the top and flatten it out. Cut around it so that you have 50mm or so bias surrounding the frame.

- Attach the vinyl to the frame using the wooden pegs. This will make pushing the spline in easier, and the flatter the vinyl is the less visible it will be. The aim is to stretch it flat, but not so tight that it warps the frame. A good technique is to put the first peg in the middle on one side (tucking the excess vinyl under the frame as you go), then in the middle on the opposite side, then do the same for the last two sides. Next pull at the corners and peg from the centre pegs out to meet the corners.



- Starting at a corner and working along the shortest edge first, push the spline into the gutter of the frame using the spline roller so that the vinyl is held firmly in place. Remove the pegs as you go. When you have made your way around the entire frame trim the spline off.



- Leave a tab of vinyl at the centre of each side. They can be handy for adjusting and remove the frame from the cavity later on. Trim off the excess vinyl with scissors.



B : Fitting the Window Film

- Clean up your work surface, or move to a clean one.
- Lay your frame down flat with the spline gutter facing upwards.
- Make sure the frame is clean and grease-free so the tape adheres well. Wipe down with some metho if necessary. Allow to dry properly before applying tape.

- Unfold film ensuring that layers are not stuck together and cut roughly to the size of your frame, allowing at least 2cm extra on all sides. You can trim the excess later.
- Apply tape around the frame making sure there are no gaps where the corners join. Before removing the tape backing paper burnish down with the back of a spoon to ensure the tape is firmly attached to the frame.
- Apply film to tape, repositioning & stretching the film to ensure there are no wrinkles attached to the tape. Wrinkles and slack within the window frame are not a problem. Most people find it easiest to roll up the film, apply one edge and gradually unroll it down the frame

- Remove any remaining wrinkles with a hair-dryer by starting in a corner and working methodically across the window taking care not to touch the film.
- Trim any excess film off beyond the line of the tape with sharp scissors or a craft knife.

- If desired, turn the frame over and repeat on the other side for extra insulation.

Fitting the Draught Foam

- Apply the window and door foam to the outer edge of the frame, working your way around the entire frame.



Fitting the Frame into the Window

- Gently push your finished frame into your window cavity. It should fit so that the foam is pressing firmly against the window reveal, sill and head, creating an airtight seal.



- If you are making frames for corner windows, foam gap filler rod can be pushed into the corner to take up the space between the two frames so that they sit firmly in place. It is available in various diameters to suit different windows.



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