

## Replacing the cabin windows on Flying Fox

The cabin windows on Flying Fox had been steadily getting worse over the 10 years of our ownership. Gradually getting more crazed and small splits appearing around the bolt holes. I finally decided to replace them in 2013.



### ***The materials:***

Investigation turned up two possible materials for the replacements, acrylic (Perspex) or polycarbonate (Lexan, Makrolon). 90% of plastic boat windows are produced using acrylic because, although it is not as strong as polycarbonate, it does not scratch so easily and it does not suffer anywhere near as much UV degradation. So acrylic was chosen.

Searching the internet turned up dozens of different suppliers, some would supply full sheets only, others would cut to size, yet more would cut to a template and some even drill the holes as per template.

Luckily the windows on FF are rectangular with radiused corners. I found a supplier who would cut to size and radius the corners for me. All I would have to do was drill the holes.

The supplier I used was Trent Plastics in Gainsborough, Lincs. I phoned the order through...

2 off 1100mm x 215mm x 5mm acrylic sheet in dark grey tint with 25mm radiused corners.

The bill came to £42 including delivery.

They were delivered three days later. On delivery, the acrylic is covered both sides with a thin plastic film for protection. Do not remove the film until the windows are fitted.

The other major choice to be made in this type of window is the sealant/bedding compound. There are literally hundreds of different silicone/polysulphide etc sealants that could be used. I decided not to use any of these because of the potential mess involved in piping out a semi-liquid onto a vertical cabin side and spreading it to a consistent thickness. There is also closed cell neoprene foam tape which I have used before for bedding various bits of hardware etc. This is much cleaner to use as it is normally sticky on one side so can be applied either to the fitting or to the deck before offering up one to the other. I decided to use a butyl mastic tape, to be specific, Arboseal GZ. This is a type of mastic that never (ever) hardens. It comes in 12m rolls and is available in different widths all 3mm thick. I got mine off ebay for £5 but I could only get 15mm width (ideally it would be 25mm).

### ***The method:***

Removing the old windows was tedious, 34 machine screws each. I used a paint scraper then a pan scourer to clean the old mastic from the cabin sides.

The machine screws were M4 panheads and had a thread with a 3.8mm diameter. I decided to drill the holes in the acrylic to 5mm because acrylic expands/contracts quite a lot and I wanted to try to minimise the chance of them cracking around the screw holes.

A normal HSS drill bit will drill a hole in acrylic but it is too aggressive and will break out at the bottom of the sheet in a shower of splinters leaving a jagged edge to the hole. You have to grind the cutting edge off the drill so that it scrapes its way through the plastic rather than cutting. Just run a file over the two cutting edges at the tip, holding the file in line with the drill bit.



Drill a couple of test holes in the old window to check that the drill bit is producing a clean hole on both sides.

Tape the old window on top of the new one, old inside face to new outside face. Using a pillar drill (because it was available) on slow speed I drilled the first hole, gently, through the old screw hole and on through the new window. Put a machine screw through and tighten the nut to prevent the windows moving relative to each other. I did the four corners first and put a screw through each. Drill the remaining holes.

Having separated the old window from the new I then went over both sides of each hole using a countersink bit. The idea is to just remove the sharp, potentially stress raising, edges of the holes. It only takes a touch of the drill bit, DON'T produce a full countersink.



The cabin sides were prepared by countersinking each screw hole. The idea being that the mastic would be compressed into the countersink forcing it around the thread of the screw and, hopefully, ensuring a waterproof seal.

The whole mating surface of the cabin side was then cleaned off with methylated spirits to try to remove any remaining contaminants.



Offer up the new window to the hole in the cabin side and, from the inside, draw the shape of the hole onto the plastic film covering the acrylic.

Lay the new window onto a flat surface and very, very gently run a stanley knife around the shape of the hole you drew. Hold the blade as flat to the surface as possible and use no more than the weight of the knife, you don't want to mark the acrylic. Strip off the plastic coating from the rim of the window.

Lay the mastic tape round the edge of the window, it is very sticky so try to get it right first time and do not stretch the tape. Get it right up to the edge. At the corners, try to create a 'baffle' to any water that may try to enter between joins in the tape. The stuff is so sticky/stretchy that this is easier said than done.

In my case I had to use two strips of mastic laid side by side because I needed a minimum width of 25mm but the tape was only 15mm.



Push a couple of machine screws into the top corners of the window and offer up to the cabin sides.

Now comes the tedious part of putting all those machine screws back into the window/cabin side. Because the holes in the windows are oversized, compared to the machine screws, it is necessary to waterproof them. Do this by adding a small cone of the mastic under the head of each screw before inserting into the window.



Inside the boat add a washer and nut to each screw and tighten them all finger tight. The windows on FF have a slight curve along the cabin side, it only takes finger pressure to invoke the curve.

Using a SMALL spanner and starting from the centre, put a turn on each nut in turn. Work both ways, top and bottom, from the centre. Repeat this tightening process several times gradually compressing the mastic. Eventually it is a matter of feel to get each nut to a similar torque. The amount of torque is, frankly, an unknown but, in my case, I can't imagine it being more than about 0.5 lb ft. Oh, and if you are a perfectionist, line up all the slots in the screw heads!

Finally remove any mastic tape that is hanging out of the corners, slice off with a stanley knife don't try to tear it off because you will pull the mastic out of the joint. Remove the plastic film to reveal your pristine window.

Only one more to go...then a small paint touch-up job.

