

## Shattered Windscreen Glass Replacement

2018

[www.rusalka.com.au](http://www.rusalka.com.au)

I came to the marina one morning and saw the aft port window pane of the windscreen shattered. The pane was still all together, no holes in it. It was all shattered and still in place. The handle was neatly mounted in the shattered pane.

These photos taken after I pulled the outside hand hold bar off and began the process of removing the glass.



*The shattered glass pane after handle was simply taken off*



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The glass was removed, including the glass chips in the grooves of the frame. The outside rubber seal along the top and bottom frames was carefully pulled off and saved for reuse. A caliper measurement confirmed it was 5mm glass. Initially the black adhesive was left in the grooves.



*Cleaning out the shattered glass*

Then a cardboard template was cut and fitted – an iterative process of trimming and fitting several times.

The template was used to purchase and cut out a 4.5mm thick acrylic window from a local plastics supplier. Two holes were cut out for the handle. This window was fitted and found to be slightly too

large so it was trimmed back a bit. A further fitting showed it needed to be trimmed back again, this time with an electric planer.

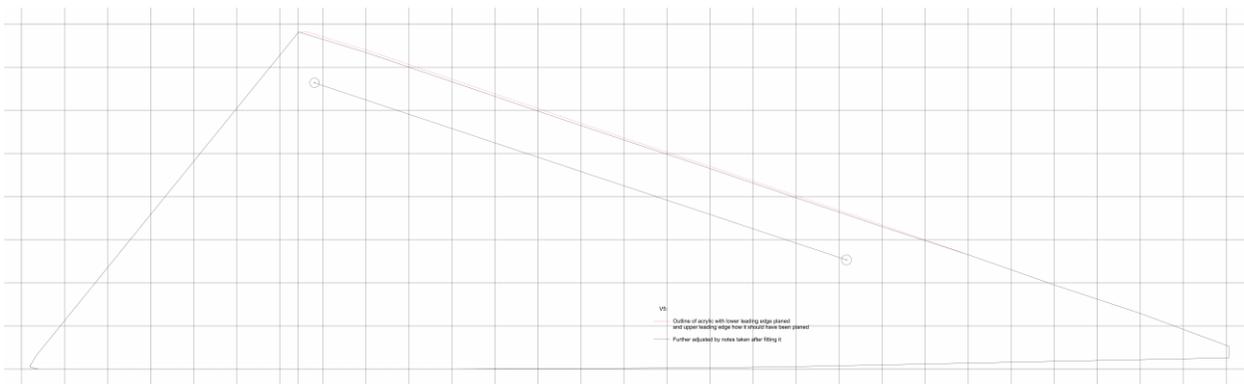
Careful measurements around the acrylic and into the frame grooves were noted for later corrections. The shape of the acrylic was traced out onto gridded paper and the final fine corrections were added.



*Acrylic window used as a template plus final trim corrections to trace/sketch then enter into computer to generate manufacturing file*

This window was fitted into the frame without adhesive. Within 24 hours of discovering the shattered pane, a temporary fix was in place.

The tracing was placed over a grid, carefully measured manually and drawn into a computer file. The file was saved as a .dxf (standard Drawing Exchange Format file). This file was sent to a local glass manufacturer who produced the required 5mm toughened glass.



*Plot of dxf file sent to glass manufacturer*

The temporary acrylic window was removed and the original adhesive also removed. The original rubber “chips” that hold the window in place as the adhesive cures were not removed.

The frame grooves were injected with adhesive. On the bottom and top frames it was mainly applied on the cockpit side of the frames. The outside needs to be kept free enough of adhesive so that the rubber seal strip can be pressed in afterwards without touching it. The forward frame groove is narrower and adhesive was applied into it as best as could be done.

The adhesive used was an SMP type, in this case Selleys SolarFlex.



*The new toughened glass pane fitted - note its slight curvature as it was slightly bent to fit into the curve of the aluminium frame*

To fit the cardboard/acrylic/glass into the frame the screw at aft end, holding down the top of the frame has to be removed. The frame is then opened. The screws along the bottom frame can be removed to help to further open up the frame. The cardboard/acrylic/glass can be forced to bend to when fitting. It is extremely important to not scratch or chip the toughened glass.

The rubber chips in the grooves are there to ensure the glass is not fitted against the aluminium frame. The groove in the forward frame is the same width as the glass thickness and has no rubber chips, so the glass is going to be held against the metal. As long as the glass is not against the other frames this should not be an issue.

Hallberg-Rassy forums talk about these windscreens shattering spontaneously. The glass is toughened glass and is subject to nickel sulphide impurities, inherent in the manufacturing process. The toughened glass, sometimes called tempered or heat treated, is under stress in the frame, in fact it is slightly curved to fit in. It is this impurity while under stress that can cause the glass to shatter, for no apparent reason, even years after manufacture.

What can be done about it? In Australia toughened glass should meet Australian Standard AS/NZS 2208:1996 which covers safety and functional properties of glass, significantly assuring the quality of the glass. Imported glass may or may not meet these standards. A process called heat soaking, although not 100% effective, can be carried out after manufacture and is, in effect, a destructive test. So passing it (ie not shattering) will minimise risk, at a cost.

**Costs (Aust dollars in 2018)**

Acrylic window pane \$40

Toughened glass, cut to dxf file \$220

Selleys SolarFlex canister \$17.95

Printing full scale drawings for checking, other misc items \$20

Reuse rubber chips, Ertec outside handle assembly and rubber seal strip

**Total \$300**

**Quote HR parts**

Toughened glass window, rubber chips, Ertec handle, rubber seal strip SEK 4279

Freight to Australia SEK 1800

Australian customs clearance fee, GST (10%) plus duty \$150

**Total approx.(Australian dollars in 2018) \$1180**

**NEXT TIME???**

Abrasion Resistant polycarbonate, ~8mm, trimmed to 5mm thickness around perimeter. Cost may be greater than toughening glass.

## **The Sealant**

ERTEC supplies the windscreen to HR and the sealant they recommend is “Simson MSR” which is “MSR Construction Adhesive is a 1 component, permanently elastic, fast curing construction adhesive based on Silyl Modified Polymer (SMP)”.

**Selleys SolarFlex** from their website:

provides protection from ultraviolet (UV) radiation and other harsh weather elements.

Selleys High Performance Sealant range, SMP (Silyl Modified Polymer).

Features

- Superior weather
- Long lasting flexibility
- No primer required before painting
- Water tight seal with a 10 year guarantee (see pack for details)
- Adhesion to wet or damp surfaces
- Better curing (>5°C)
- Non-bubbling
- Better extrudability (>5°C) with no slump
- Paintable with water-based paints after product skins in 60 to 90 minutes
- Low VOC – so can be used in any environment without discomfort

Materials this product suitable for

- Concrete
- Timber
- Metals
- Cement sheeting
- Brick
- Plasterboard
- Ceramic tiles
- Fibreglass

## From Ertec

### INSTRUCTION.

1. Remove the aft end screw that holds the top/bottom aluminium profiles together.
2. In some cases it can help if the side panels bottom profile is also loosened.
3. Pull out the rubber gasket ( 2 ) from top- and bottomframe. Can be reused.
4. Remove the glass (5) and sealing compounding (4) from the slot. Make sure no glass fragments are hidden inside the slot.
5. Use enclosed rubberchips inside the slot to avoid contact between glass and frame.
6. Half-fill the slot with new sealingcompound ( 4 ).
7. Slide glass into position.
8. Screw the top/bottom profiles together with the screw.
9. Note! There must be sufficient sealing compound between the glass (5) and the frame. Refill if necessary.
10. Assamble the rubberpacking ( 2 ) or replace by using a sealing compound joint.
11. Remove the extra sealing compound using a suitable cleaner. Normal curingtime is 3mm/ 24 h.
12. Done, Fertig, Fin.

