

# GLAZING INSTALLATION & DESIGN FOR MARINE VESSELS

## PREPARATION OF MARINE VESSEL SUBSTRATE

1. Light sand bonding area and eliminate dust with brush and vacuum cleaner.
2. Carefully Mask Tape the area to be prepared on the vessel.
3. Apply with brush or clean cloth one layer of **Activator Cleaner AC50 or Heptane or Good quality Industrial Alcohol**. Drying time minimum 15 minutes, maximum 2 hours.
4. If you leave for more than 24 hours, dust might have collected on the prepared surface, eliminate dust with brush and vacuum cleaner, and reapply.

## PREPARATION OF GLAZING PANEL

Note: Some glass is supplied wrapped in plastic wrap that has had a surface treatment to ensure the plastic wrap stays fixed to the glass during transport. Once wrap is removed for preparation wipe the preparation area clean with **Heptane or a Good quality Industrial Alcohol**.

1. Mask tape around the preparation area on the glazing panel.
2. Apply **Heptane or Good quality Industrial Alcohol** with a clean cloth rotate the cloth as you apply in order to pre clean the glass, remove all greasy or smudge marks that are present.
3. Apply **AC50 Activator Cleaner** with a clean cloth WIPE ON rotating the cloth and pouring the AC50 Activator Cleaner into the rag and apply a thin layer of product. Let it dry for at least 2 minutes, and with a new dry clean cloth WIPE OFF.
4. ENSURE NOTHING WILL CONTAMINANT THIS SURFACE.
5. **Shake Blackout Glass UV Primer PR30** for 60 seconds after the mixing marbles are clearly rattling around in the container and let settle for 30 seconds.
6. Apply **PR30** with a felt pad or brush or roller over the previously prepared area, minimum drying time is 15 minutes and check for pin holes by holding the glass panel to the light or run a sheet of white paper underneath (Not suitable for spraying).
7. Repeat the application after a minimum of 30 minutes with **PR30** until all the pinholes in the **PR30 coating** is covered, if the first layer of PR30 is reactivated let the first layer dry for another 30 minutes.
8. Drying time: minimum 15 minutes to 30 minutes
9. Recoat with the second layer of PR30, once satisfied remove the masking tape carefully so as to not create any strings, pull the tape close to the window and slightly across the UV blackout.

Note: due to the wide variety of mineral glass, it is advisable to perform preliminary adhesion testing before committing to the entire project.

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## APPLICATION OF ADHESIVE/SEALANT AND POSITIONING

1. Apply the Double Sided Adhesive or Single Sided Adhesive Glazing Tape onto the Yacht substrate in the position required by the Yacht designer, this is usually located near the inner perimeter of the window void, keep the outer tape shield on until just before the glass is positioned.
2. Position spacers and window locator marks to ensure when the window is rotated in position. Very little if any adjustment is required (the choice is a function of dimension and type of panel to apply).
3. DRY FIT TO CONFIRM PLACEMENT.
4. Open the **FIXSEAL MSP190** by:
  - a. Cut off the top of the threaded section to open the cartridge and screw on the applicator nozzle cut to suit the bead size required.
  - b. If using a sausage place the sausage into the barrel tool and cut the sausage just behind the clip, screw on the cap with nozzle cut to size of bead required.
5. Apply **FIXSEAL MSP190** onto the structure of the vessel behind the Glazing tape.
6. Peel off the cover to the Double Sided Glazing Tape.
7. Within 10 -15 minutes the glass panel must be positioned and pressed on to the structure to the spacer distance. The structure must be mechanically fixed for at least 24 hours when using MSP190 and 12 hours when using MSP190 FAST.

## FINISHING AND SEALING GLASS PANEL

### FINISHING PREPARATION

After 24 hours the space between glass and vessel structure can be sealed

1. Remove mechanical fixings after minimum 24 hours, if glass is under pressure i.e. curved then wait a minimum 48 hours to 7 days depends on deformation load applied to the glass and temperature. Lower the temperature the longer the wait, higher the temperature shorter the wait.
2. Wipe vessel area and the end of the Glass panel with **Heptane or Good quality Alcohol** as previously specified,
3. Use masking tape to cover the external face of the glass edge and the yacht rebate edge this will then form the position of the finishing sealant.

### FINISHING APPLICATION

Equipment required: smooth trowel or coving tool, (soapy water diluted in a spray bottle, best to use dish washing liquid soap diluted).

1. Cut the top seal off the cartridge of **FixSeal MSP190**, and screw on nozzle, cut tip to required diameter.
2. Apply the **FixSeal MSP190** into the space.
3. With the clean finishing tool made from Polypropylene PP or Polyethylene PE and dry blade the surface of the sealant to form the shape.
4. If you can do this in one step the better the finish. Wipe the tool with a clean cloth to remove excess collected. (The less you tool the product the better the result).
5. Try to ensure the cut off points are on the edge of the masking tape so the tape does not get caught under the sealant.
6. If required a last minute finish can be done by thoroughly wetting with a diluted soapy water solution, only use diluted dishwashing liquid as tooling lubricant, spray surface thoroughly and tool once more, if you do not have to do this then do not touch it.

*This information has been given in good faith and with the knowledge best known at the time of documentation. It is recommended that due to the differences found in glass that a sample be made before proceeding with the entire job. All technical information is given in good faith and the designers should be professional and consult current design regulations as required by each yacht/vessel.*

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7. Immediately peel away the mask tape from the glass and vessel structure back on itself and away from the sealant, this will reduce any string effect, if any edge has lifted during this procedure, spray your finger "only" not the sealant, as you do not want to put a lubricant between the sealant and the surface, the result if this will be a edge curl at a later stage.
8. It is best to leave the sealant alone at this stage and ensure no airborne dust is present until the sealant has cured.
9. Best results it is best to cover the window sealant from direct sunlight until the sealant has fully cured, or complete the project under roof.

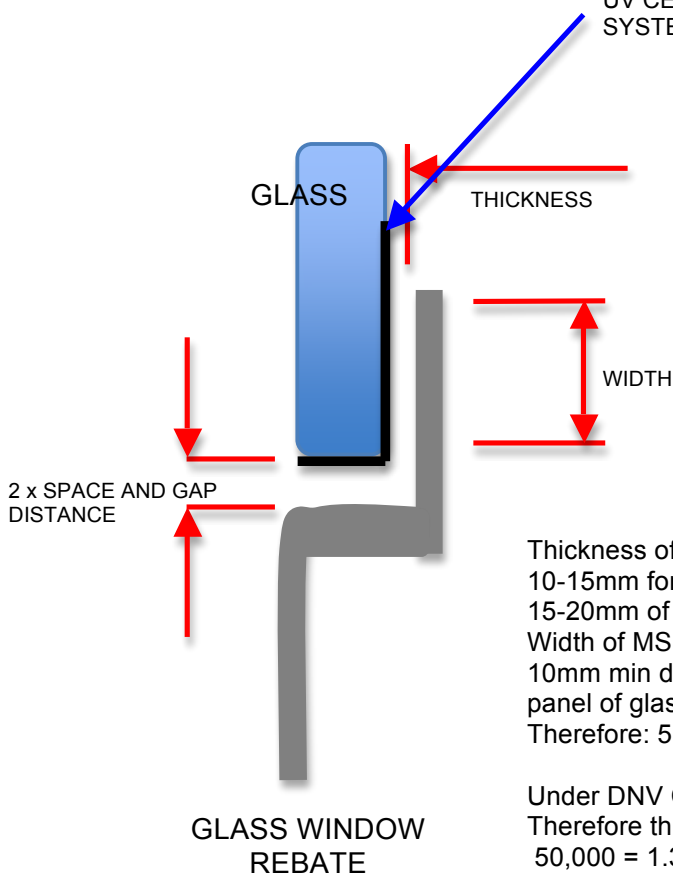
#### Rules:

Read TDS for MSP190 and AC50 and PR30 to understand the system fully.

If the glass is supplied with UV Blackout ceramic band then only used Heptane or a good quality industrial alcohol to wipe down the ceramic band area. Ensure the ceramic band is supplied by a good quality glass manufacturer. The manufacturer should ensure the light transmission through the UV ceramic band must be less that 0.0001% (Gretag D200 380-630nm) for use on Class Certified yachts and 0.001% light transmission (Gretag D200 380-630nm) for non class certified yachts.

#### Toughened or safety laminated glass windows

UV CERAMIC BAND OR AC50 AND PR30 UV BLACKOUT SYSTEM, FOR BEST RESULTS COAT WINDOW EDGE ALSO.



- 1: Thickness = Sealant Thickness when depressed. (4.8mm min).
- 2: Width = Width of sealant required or permissible. (10mm min.)
- 3: Space & Gap Thickness= Distance between glass and substrate and glass and glass. (Spacing = 2 x Gap,
4. Therefore gap min (10mm) perimeter and Spacing (20mm) Middle.

#### Typical Adhesive MSP190 setup:

Thickness of MSP190?  
 10-15mm for all glass up to 1.5m  
 15-20mm of all glass 1.5m -3m long  
 Width of MSP190?  
 10mm min depends on load required say 5 m head pressure on 1m<sup>2</sup> panel of glass. Water weight is 10,000N/m<sup>3</sup>  
 Therefore: 5 meter head pressure over 1m<sup>2</sup> = 50,000N

Under DNV Certification Fixtech MSP190 Tensile capacity 1.3 MPa  
 Therefore thickness of MSP190 bond area is :  
 $50,000 = 1.3 \times "X" \times "L"$  , "L" = 4000mm for 1m<sup>2</sup> Window Perimeter.  
 Therefore "X" =  $50000/1.3/4000 = 9.6\text{mm} = 10\text{mm}$  base min.  
 The More load applied the more width required or do a second or third parallel run.

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Shear load same applies just different loading direction:

Regarding Depth:

No movement state:  
(Glass side)



Movement state:  
(Glass side)



Movement State  
(Glass side)



The glass will shrink when exposed to very cold changes and expand when exposed to hot, based on the temperature it was installed at.

This is to do with thermal expansion coefficient of Glass, and in this case it is quite low.

At  $9 \times 10^{-6}$  m/m \* Change in Temperature therefore:

Thermal Expansion of Glass is (m) =  $0.000009 \times 1\text{m} \times 50^{\circ}\text{C}$  (Typical used)  
=  $0.00045\text{m} = 0.45\text{mm}$  (not very much total)

But MSP190 has movement ability  $\pm 20\%$

Therefore  $0.45\text{mm}/0.2 = 2.3\text{mm}$  (min 3mm)

Recommend a thickness of 3mm (min) and 4.8-5mm is ideal This is based on our dam tape thickness.

Application please refer to the Fixtech Catalogue for Nozzle pre-cut.

Ensure a Vee-Notch is used in the nozzle and that the height of the triangle (min) is 2 x the width.

Please read the Technical Data sheet (TDS) and Catalogue before starting.

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