



## Marine Surveys UK

*"Pragmatic Surveys in Plain English"*

[www.marinesurveysuk.com](http://www.marinesurveysuk.com)

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Survey Report no: [REDACTED]

Name of Vessel: "[REDACTED]"

Type of Vessel: Etap 21i, FRP (Fibre reinforced Plastic), Bermudian sloop fractional rig with outboard motor.

Type of survey: Pre-purchase

### **At the request of:**

[REDACTED]

This survey was carried out on the [REDACTED] at Chichester Marina, both in the water and with the boat hanging from slings in the travel hoist at the premises of Premier Marinas Chichester, West Sussex, UK. The above named being a potential purchaser of the vessel.



**Limitations:**

- ✚ Where access is restricted by fixed panels, linings etc. it was not possible to examine and I cannot say those areas are free from defects.
- ✚ This report has been prepared for the use of the commissioning client and no liability is extended to others who may see it.
- ✚ In some cases it is not possible to detect latent and hidden defects without destructive testing which is not possible without the Owner's consent.

**Scope of Survey:**

- ✚ This is a Pre-Purchase Survey and its purpose is to establish the structural and general condition of the vessel. Where items of equipment have been tested this will be stated in the text.
- ✚ Camera equipment was used in places to view normally inaccessible areas and the pictures analysed to identify any issues.
- ✚ A general inspection of the engine and installation will be made; this is a visual inspection. The engine was run briefly. It should be appreciated that some components may appear serviceable but found to be defective when the engine is run for a long period of time.
- ✚ The vessel was surveyed in and out of the water and tests carried out as described to ascertain any possible sources of water ingress.
- ✚ The hatches and port lights were not leak tested with a hose.

**Recommendations and advisory notes:**

- ✚ Recommendations will be restricted to those defects which should be rectified before vessel is used, (or within a given time span if specified), and items which may affect insurability. These will not be made concerning cosmetic or other minor defects, although relevant suggestions may be made in the text.
- ✚ ***Recommendations will be printed in bold italics for quick reference.***
- ✚ The recommendations are contained in the body of report in order that they may be read in context, and are also listed as part of the conclusions at the end of this Report.
- ✚ **Advisory notes** are suggestions to prevent a problem getting worse or general advice and do not have to be carried out before the vessel is used nor should affect the boats current insurability.

**Conditions of Survey:**

Vessel was examined in the water and hanging in slings. It was also lowered onto its keel. The weather was mixed rain and sunshine.

No special conditions affected the survey other than as described in the text.



Information is reported in the Sections below, followed by recommendations and conclusions.

**Hull, Deck and Structure.**

1. Details of Subject Vessel, (General Description, Dimensions, Registration etc.).
2. Keel.
3. Hull below Waterline.
4. Topsides above Waterline including Rubbing Strake etc.
5. Deck Moulding.
6. Coach roof.
7. Cockpit.
8. Hull/Deck Join.
9. Bulkheads and Structural Stiffening including Internal Mouldings.

**Steering, Stern Gear, anodes and Skin Fittings**

10. Rudder and Steering.
11. Stern Gear.
12. Cathodic Protection.
13. Skin Fittings and other through Hull Apertures.

**On Deck.**

14. Main Companionway and other accesses to accommodation.
15. Ports Windows etc.
16. Pulpit, Stanchions, Pushpit, Lifelines and Jackstays.
17. Rigging attachment points.
18. Ground Tackle and Mooring Arrangements.
19. Other Deck Gear and Fittings.
20. Davits and Boarding Ladders.

**Rig.**

21. Spars.
22. Standing Rigging.
23. Running Rigging.
24. Sails and Covers etc.

**Safety.**

25. Navigation Lights.
26. Bilge Pumping Arrangements.
27. Fire fighting Equipment.
28. Lifesaving and Emergency Equipment.

**Engine.**

29. Engine and Installation.
30. Fuel System.

**Accommodation and onboard Systems.**

31. Accommodation General.
32. Gas Installation.
33. Fresh Water Tanks and Delivery.
34. Heads.
35. Electrical Installation.
36. Electronic and Navigation Equipment.
37. Heating & Refrigeration



**1. Details of subject vessel:**

The Etap 21i is one of a range of stated "unsinkable" yachts built by ETAP Yachting N.V, Steenovenstraat 2, B-2390, Malle, Belgium. She is a twin rudder, tandem keel. The hull is constructed of an outer and inner liner with closed cell foam in between.

**Manufacturers' information owner's manual aboard (not verified by measurement)**

|                     |            |
|---------------------|------------|
| Length Overall      | 6.81m      |
| Length of waterline | 6.10m      |
| Beam:               | 2.49m      |
| Draft:              | 0.7m       |
| Displacement        | 1.10 ton   |
| CE Specification    | Yes CE0609 |

**Boat specific information**

|               |                                    |
|---------------|------------------------------------|
| Registration  | None seen                          |
| Hin Number    | BEETP2 [REDACTED] D898             |
| Year of Build | April 1998                         |
| CE            | Category C, 6 person maximum 600KG |

The CE category is a rating system used in the EU to rate the seaworthiness of a (sailing / motor) boat. This CE category is mainly used by European boat builders although some US sailboat builders start to build boats to this specification. The European Directive specifying the CE Categories for recreational boats between 2.5 and 24 meter in length is the EU Recreational Craft Directive (RCD).

The CE category is

C: Inshore.

Designed for voyages in coastal waters, large bays, estuaries, lakes and rivers where conditions up to, and including, wind force 6 (Beaufort) and wave height up to 2 meter (6'6" ft).

**2. Keel**

- a) The keel is of iron, in tandem style. It is attached to the hull with stainless steel studs. Inside the hull are stainless steel plates and nuts. There is a stud forward and aft and 2 groups of 3 studs. 8 in total.
- b) The keel surface is covered in pitting through the paint. It scrapes off easily to a shiny surface. This is caused by electrolyse from stray currents in the marina and the paint breaking down on the keel.
- c) The joint of keel to hull is filled with sealant and at the back edge it appears to have been further filled. This was checked with a spike and at the back edge, the spike went behind the sealant.



- d) Inboard the vessel, the aft keel nut and plate has compressed the inner moulding by approximately 2mm across a section of 150mm. The inner liner has stress cracks at this point.
- e) The forward keel nut has mild corrosion on it and does one of the second set forward. This is clearly visible under the cabin sole boards.
- f) There is no water in the bilge of the boat when it was afloat and no signs it has been dried out recently.
- g) I saw the keel hanging in the slings and then lowered it onto wooden blocks. During this process the hull and keel joint moved at the aft end some 5mm and black water squeezed out.



***Recommendation:- The hull keel attachment is not as secure as it should be. Coupled with the moisture reported in the hull below, I recommend that the keel be dropped, the threads of the studs checked. The hull checked around the stud holes. If all is found sound or after repairs made, the keel reseated with Sikaflex 216 or similar joint compound and the nuts tightened to correct torque. This is to stop water creeping up the threads and causing corrosion and possibly entering the sandwich section although the area around the keel bolts should be solid FRP. The outside surface of the keel should be cleaned up to bare metal, the keel primer with suitable iron primer and antifouling paint applied.***

### **3. Hull below Waterline:**

- a) Construction of the hull below the waterline is FRP with closed cell foam behind it and then the inner liner of FRP. It is finished in white gel coat and coated in what I believe to be 3 layers of epoxy paint and two or more coats of old antifouling paint. The vessel had a medium coating of growth. A lot of antifouling came away with the pressure washer clean.
- b) Light hammer sounding was carried out (not heavy enough to damage the anti-fouling) of the hull at regular intervals approximately 500mm spacing all over. The findings were inconclusive as the sandwich section distorts the noise.
- c) The antifouling was removed in 10 patches approximately 50mm x 50mm at random around the hull below the water line. While scraping I was looking for evidence of



wicking or blistering and once removed all patches were checked with 10x magnification. None were found.

- d) There are no signs of major damage or repairs to the hull.
- e) Moisture readings were taken where the antifouling was removed using a capacitance type moisture meter of Sovereign Quantum type, operating in both shallow and deep reading modes. The meter was first checked for correct calibration.

The readings recorded below are from the meter operating in the shallow and also deep mode on the relative scale 0-100.

The readings are relative and **do not** express moisture content as a percentage of dry weight. High moisture content is not generally a structural defect, and is to be expected in older boats. However where some moisture has been absorbed the likelihood of moisture related problems occurring is higher, and the actual state of the laminate cannot be completely guaranteed without destructive testing followed by chemical analysis. The opinion given in this survey is based on all the evidence available at the time but without destructive testing.

The conditions prevailing when the readings were taken were as follows:

|  |            |
|--|------------|
| Air Temperature:   | 16°C       |
| Relative Humidity:   | 61%        |
| Time ashore  | 30 minutes |
| In summary the weather conditions for obtaining moisture readings were <b>poor</b> |            |

Readings were as follows:

| Meter  | Range below waterline. | Range above waterline. |
|--|------------------------|------------------------|
| Sovereign Quantum, Scale A, 0-100 Shallow mode | 27 - 46                | 9                      |
| Deep Mode                                      | 35 – 64                | 8                      |

These readings need to be considered in conjunction with the period the vessel has been ashore and the weather conditions when obtained. As a rule of thumb you can expect the levels to drop by one range after a few weeks ashore.

The difference between readings above the water line (normally dry) and below should be noted.

The interpretation of the readings in shallow mode range;

- 0 – 15 : For all practical purposes may be considered dry.
- 16 - 20: Some moisture present at low levels but of no great concern.



- 21 - 30: Considered medium, but those at the top of the range i.e 30 are at the point where the risk of moisture related defects developing is significant.
- 31- 45 Considered high and at a level where the risk of moisture related defects being present but not yet physically detectable is significant.
- 46 – 60 Very High and will usually be accompanied by physically detectable signs. Likely to be accompanied by a significant increase when switching to deep mode.
- 61 – 100 extremely high and indicative of possible laminate damage in addition to osmotic blistering. Likely to be accompanied by a significant increase when switching to deep mode.

**Advisory note:-** Always storing the boat ashore out of season to allow some natural drying out to occur will contribute significantly to improving condition.

The readings were exceptionally high in places and I have done some research on these boats. It appears this is common on the Etaps and it is reported that the factory states that the reason for the high readings is condensation and moisture getting between the FRP and Foam. See web discussion at

<http://www.tabcrest.com/ea/phpBB2/viewtopic.php?p=631&sid=3129dfbccbe35abc7a08abd12a54e2>. There are no physical signs of defects on the hull from moisture related

problems like wicking or blistering. The factory theory could be correct but without taking a core sample cannot be conclusive for this boat. Again, it is reported that a solution is to drill holes in the inner moulding to drain water and ventilate the boat. As the recommendation is to remove the keel and this is most likely the cause of any water ingress, I suggest checking here first and then maybe drill a 3 mm hole horizontally into some of the cross member voids to see if any moisture is found. Allow to dry out as long as possible.

#### **4. Topsides above Waterline including Rubbing Strake:**

- a) Constructed of solid FRP with an inner moulding. I cannot confirm if there is a foam core at deck or not. It is finished in white gel coat.
- b) Top side moulding found fair (no deflections).
- c) The topsides were lightly hammer sounded and no indication of voids found. Moisture readings were taken and recorded as above.
- d) There is a minor repair at the bow covered by the boot top line.

#### **5. Deck moulding:**

- a) The deck is of solid FRP. The inside is fully lined with inner mouldings. Externally it has a smooth Treadmaster non slip fitted to most of it.
- b) The whole deck was carefully tested underfoot for signs of delaminating or other structural defects and none were found.



**6. Coachroof:**

- a) This is constructed as part of the same moulding as the deck, but finished with moulded in non slip pattern in white.
- c) The whole area was carefully tested underfoot for signs of delaminating or other structural defects.
- d) There was no flexing below or around the mast base area when the shrouds were flexed.

**7. Cockpit:**

- a) This is constructed as part of the same moulding as the deck and finished with moulded non slip. The sides seating area is stuck on teak faced plywood.
- b) Drainage is directly out of the transom which has an aluminium cover open at the base and two small drains.
- c) The wood is well adhered and although in need of a clean, no gaps were seen.
- d) The two lockers either side have rubber gaskets, secure hinges and methods of closure.

**8. Hull/Deck Join:**

- a) The deck moulding wraps over the hull and is secured with bonding paste. On the outside an aluminium rubbing strake is screwed through the joint. The inside of the joint is not visible.
- b) The outside joint was carefully checked and no signs of distortion noted. There are no signs of leaks on the inside of the hull but there is a full inner liner restricting access.

**9. Bulkheads and Structural Stiffening including Internal Mouldings:**

This is a Monocoque (single box) construction and a number of components contribute to the overall structure.

- a) The hull and deck mouldings are robust in the first place. There are full inner liners and the joint is filled with closed cell foam. Floors are moulded into the inner liner. (Floors being box sections running across the hull but not to deck level).
- b) All possible access was checked, lockers, under berths and the floors and inner mouldings for signs of delamination and cracks.
- c) The mast loadings are transferred to a box section moulded below the deck taking the loadings to the hull. Again, inner linings cover this area. These linings have moved slightly and the filler has cracked.

**10. Rudder and Steering:**

- a) The vessel has twin FRP rudders hung on aluminium gudgeon and pintal fixings. They are connected to the tiller by stainless steel bars in ball and socket joints. The tiller is fixed through the transom section with stainless cotter pin secured with split pin. This is bolted to the upper transom section.



- b) The rudders was leant on with full body weight in either direction and did not give or any split open up.
- c) The port fixing nuts for the pintal on the rudder are stainless steel dome nuts and have signs of minor corrosion on them. The starboard rudder fixings are aluminium. The nuts were secure when hit with a hammer, however the mixing of stainless steel and aluminium with mean that the aluminium with suffer galvanic corrosion.
- d) The rudder blades were scraped of antifouling paint and checked for moisture. The readings were 11 shallow 15 deep.
- e) There are 3 stress cracks in the top of the port rudder. These radiate from the fixing holes for the caps and upper pintal. I was not able to get these to open up. They should be monitored and waxed to prevent any water ingress into the laminates.

**Advisory note:** I suggest the stainless fixings are changed to all alloy fixings as designed.

### **11. Stern Gear:**

- a) This is part of the Outboard reported in section 29

### **12. Cathodic Protection:**

- a) There is an anode on the outboard bracket, partially wasted. It should last another season.
- b) There is an anode on the outboard leg, partially wasted. It should also last another season.
- c) There are no hull anodes and the keel and ball valve on the galley are showing signs of galvanic action from the marina.

**Advisory note:-** Consider fitting an anode to the keel or have a hang over the side anode that bolts to a keel stud for use in a marina. If the keel is well painted then this will not be necessary.

### **13. Skin Fittings and other through Hull Apertures:**

Some thru hulls may not be reported below but will be with relevant systems sections. No skin fittings or valves were dismantled as part of this survey but the following routine tests were carried out:

- ✚ Examination from outside and inside the boat. Checked for de-zincification
- ✚ All valves open and closed to their full extent where possible.
- ✚ Any fixing bolts hammer tested where accessible.
- ✚ Bodies of metal valves or sea cocks tested with a hammer inside the boat and external parts hammer tested outside the boat.
- ✚ Fittings aggressively tested inside the boat for security in the hull.
- ✚ Hose clips inspected and hoses aggressively tested for security. 2 clips correctly fitted below water line on outlet spigot unless noted.
- ✚ Lying fair to hull unless noted

### **Below Waterline:**



- a) Galley sink drain, located under galley. Yellow metal skin fitting with silver coloured ball valve and yellow metal spigot. 2 hose clips. The valve and skin fitting inboard have surface corrosion.
- b) Log and depth fittings, both plastic through hulls.



**Advisory note:** Although the fitting passes the tests above and the outside scraped to clean metal, for the relatively low cost, I suggest that the ball valve is removed and cleaned and replaced if required.

#### **14. Main Companionway and other Access to Accommodation:**

These were all checked;

- ✚ to be lying fair to the deck
- ✚ fixings were randomly tested with screw driver for tightness
- ✚ frames checked for damage
- ✚ a secure method of closure
- ✚ correctly fitted hinges
- ✚ glazing checked for damage
- ✚ gaskets checked

All found ok unless noted. The hatches were not hose tested for leaks.

- a) Companion way is sliding FRP hatch in alloy runners. There are two washboards of Plexiglas. The lower board fixes in its runner. The upper will only stay in position with the hatch closed. The corners of the FRP are worn.
- b) The round fore hatch is aft hinged and has two catches forward.

**Advisory note:-** Keep fore hatch closed at sea.

#### **15. Ports, Windows etc.:**

None fitted.

#### **16. Pulpit, Stanchions, Pushpit, Lifelines and Jackstays:**

These are tested under full body weight where practical, terminal ends checked, type of wire tested. Life line attachment points are tested with a crow bar levered against a wooden block.

- a) Pulpit, pushpit and side bars are stainless steel. One plastic covered wire fitted to the top. The bases are alloy. The aft pulpit legs and forward pushpit legs fit in alloy bases the other legs are bolted through the deck.
- b) The alloy bases are corroding where the stainless steel is touching it. They are still firm.
- c) The pushpit aft legs are both loose where they bolt through the deck.
- d) There are two life line attachment points in the cockpit.



**Recommendation:- Tighten aft pushpit legs as they are the back stay fixings too.**

### **17. Rigging Attachment Points:**

- ✚ All attachment points were tested visually with 10 x magnification
- ✚ Nuts and bolts struck with hammer against sheer where possible
- ✚ Checked with magnet for quality of steel where possible
- ✚ Fittings tested with a substantial crowbar on wood block

Unless noted below, no movement found. No sign of seepage via deck fittings. No distortion noted.

- a) Main and lower shrouds attach to a stainless steel deck plate. The underside of the deck plate could not be accessed. This is attached to a stainless steel chain plate fitted to a stainless fixing that bolts through the hull to a second plate fitted externally. The loading is transferred to the top sides.
- b) The forestay attaches to a stainless steel stem head fitting bolted in tension to the deck. The underside was not accessible.
- c) The back stays fit to the pulpits.

### **18. Ground Tackle and Mooring Arrangements:**

- a) Main Anchor is from what I can ascertain is a 4 KG Danforth anchor with 1m x 7 mm chain and a length of 10mm warp.
- b) No kedge anchor seen.
- c) Mooring cleats fore and aft were tested with crowbar and block and found secure.

**Advisory note:** The MCA recommend a minimum of 10m of chain is fitted to the anchor.

### **19. Other Deck Gear and Fittings:**

- a) Turning blocks and jammers all found of adequate size and securely through bolted, the underside visible due to design of headlining. No excessive corrosion noted.
- b) The winches fitted were all tested as far as possible but not under load and no play found on base and were they were free to turn.
- c) Genoa sheet tracks and cars operated correctly. No faults found.
- d) The main sheet is a single fixing in the cockpit.

### **20. Davits and Boarding Ladders:**

- a) None seen.

### **21. Spars:**

- a) The mast is silver anodised. It is deck stepped with a tabernacle fixing. It was inspected to head height only. It is a single section, single spreader, fractionally rigged.
- b) No signs of distortion were noted. No excessive corrosion or stress lines noted.



- c) Boom and gooseneck in similar condition to mast.

### **22. Standing Rigging:**

- a) The shrouds are Dyform. No evidence that they have been replaced. The double back stay is 1 x 19 wire with copper ferrule terminals.
- b) Rigging was examined where the wire enters the terminals under 10x magnification, no broken strands visible nor excess corrosion seen. The angles they enter the mast appears in line with rigging.
- c) The closed rigging screws are stainless steel and examined under 10 x magnifications. No faults found.
- d) The forestay has a Selden Furlex furling system fitted.
- e) The port outer shroud has a slight kink in it below the spreader.

**Advisory note:** Some insurance companies insist rigging is changed at 10 years. This really depends on its use during that time.

**Recommendation:** *The mast should be lowered and the rigging checked at the top terminals. The port shroud checked by a professional competent rigger. I suspect it will have to be replaced, in which case, if no receipts to indicate replacement previously, all standing rigging wires should be replaced at the same time.*

### **23. Running Rigging:**

- a) The running rigging is dirty and stiff from the weather.

### **24. Sails and Covers etc:**

- a) A very good condition Rockall genoa was inspected in its bag. No faults found.
- b) A torn genoa was seen in the aft locker. Not further checked.
- c) A Kemp Asymmetric spinnaker or cruising chute was inspected in its bag. Stitching checked with 50p coin to check for deterioration.
- d) The mainsail was checked on the boom. It is dirty and slightly mildew affected at the top, and has lost some of its stiffness (resin from cloth). Stitching checked and ok where tested.
- e) The sail cover is cracking, it is plastic coated. The velco does not work at the mast.

### **25. Navigation Lights:**

Vessel fitted with lights of correct size, securely mounted and seen working unless noted.

- a) Tricolour and Mooring light at mast head – it did not appear to light.

**Recommendation:** *Vessel should have a working tri colour and all around white for use in poor visibility.*



**26. Bilge Pumping Arrangements:**

- a) No fixed bilge pumps fitted. Two buckets and a bailer in locker.

**27. Fire-fighting Equipment:**

- a) 1 x fire blanket under galley  
b) 1 x 950g powder extinguisher – expired 2004

***Recommendation: At least one 1 kg fire extinguisher to rating 5A34B should be fitted. Fire blanket should not be stowed under galley but nearby.***

**28. Lifesaving and Emergency Equipment:**

The following was noted aboard

- a) Two Seago 175N Autogas life jackets to EN396 – new condition, cylinders not fitted.

**Advisory notes** I am not aware what safety equipment is included in the sale.

- The RNLI operate an excellent free inspection and advice service concerning levels of safety equipment (SEA Check) and can be contacted on 08003280600 or via the RNLI website, [www.rnli.org.uk](http://www.rnli.org.uk).
- The RYA also publishes a booklet, G16, "The Boat Safety Handbook" and this specifies levels of Safety Equipment for different categories of use. Booklet is obtainable from nautical bookshops or direct from the RYA, [www.rya.org.uk](http://www.rya.org.uk).

***Recommendation - this vessel be equipped with safety equipment to the level appropriate to proposed use.***

**29. Engine and Installation:**

- a) Suzuki 2 stroke mix petrol outboard serial number DT8C – 00802 – 751608  
b) Propeller is a 3 blade aluminium in fair condition, some small chips in blades. Securely fitted.  
c) The engine bracket is bolted through the transom fixing. Bolts tested with a hammer and found secure.  
d) There is some corrosion on the leg.  
e) Removing the cover, the engine is well greased with minor corrosion stains around the water system.  
f) There was no kill cord, but I was able to start the engine using a clip. It started after about 6 pulls, ran quite smooth but fast, quite smoky but blue fuel mix smoke. It cut out after revving. I started a few more times quite easily but it continued to cut out after about a minute. I suspect the carburettor needs cleaning or a new spark plug required.

**Advisory note:-** Have outboard serviced and get corrosion painted over.



### **30. Fuel System:**

- a) The remote metal fuel container is located in a well under the cockpit sole. There is a second can and fuel line in the cockpit locker.
- b) The metal containers are rusty at the seams and not ideal for a salt water environment.
- c) The fuel hoses, while standard outboard hoses from the age of boat are not ISO 7840 marked and the fittings are mildly corroding.

***Recommendation:- Replace fuel container with a plastic one or clean and paint container under cockpit sole if none can be found to fit. At same time replace fuel line if replacing container.***

### **31. Accommodation General:**

- a) There is some movement of the inner liner under the mast resulting in cracks in the filler.
- b) The cushions have some stains
- c) The cockpit sole and galley wood are a bit worn.
- d) Has a dry clean feel to it.

### **32. Gas Installation:**

No gas fitted. The cooker is a Origo 3000 alcohol 2 burner cooker in good condition.

### **33. Fresh Water Tanks and Delivery.**

- a) Two plastic jerry cans with pipe to hand pump at sink. Worked fine.

### **34. Heads:**

- a) None fitted.

### **35. Electrical Installation:**

#### DC circuits

- a) A single halford Liesure battery 70AH fitted in dedicated box in cockpit locker with strap to secure in place. Terminals are not insulated but the box has lid. Terminals tight. The battery is charged from the outboard.
- b) All circuits from switch panels with circuit breakers.
- c) Isolator switch located down aft berth. Terminals in locker not insulated.

**Advisory note:- Insulate bare terminals to prevent accidental shorting.**

#### 240v Circuits

- d) No permanent installation fitted. Shore lead and battery charger were seen in locker.

### **36. Electronic and Navigation Equipment:**

The following were seen aboard and operating

- a) Binnacle compass – no deviation card seen.
- b) Garmin GPS Map 76 Hand held with bracket in cockpit
- c) VHF Compact SX25 marine – Not DSC



d) Autohelm Bi Data depth sounder and speed log.

**37. Heating and refrigeration**

None



## **RECOMMENDATIONS and CONCLUSIONS:**

### **List of Recommendations:**

The Recommendations made in the Report are listed below with their respective section numbers. *All Recommendations should be carried out before use of vessel or as stated.*

#### **2. Keel**

Recommendation:- The hull keel attachment is not as secure as it should be. Coupled with the moisture reported in the hull below, I recommend that the keel be dropped, the threads of the studs checked. The hull checked around the stud holes. If all is found sound or after repairs made, the keel reseated with Sikaflex 216 or similar joint compound and the nuts tightened to correct torque. This is to stop water creeping up the threads and causing corrosion and possibly entering the sandwich section although the area around the keel bolts should be solid FRP. The outside surface of the keel should be cleaned up to bare metal, the keel primer with suitable iron primer and antifouling paint applied.

#### **16. Pulpit, Stanchions, Pushpit, Lifelines and Jackstays:**

Recommendation:- Tighten aft pushpit legs as they are the back stay fixings too.

#### **22. Standing Rigging:**

Recommendation: The mast should be lowered and the rigging checked at the top terminals. The port shroud checked by a professional competent rigger. I suspect it will have to be replaced, in which case, if no receipts to indicate replacement previously, all standing rigging wires should be replaced at the same time.

#### **25. Navigation Lights:**

Recommendation: Vessel should have a working tri colour and all around white for use in poor visibility.

#### **27. Fire-fighting Equipment:**

Recommendation: At least one 1 kg fire extinguisher to rating 5A34B should be fitted. Fire blanket should not be stowed under galley but nearby.

#### **28. Lifesaving and Emergency Equipment:**

Recommendation - this vessel be equipped with safety equipment to the level appropriate to proposed use.

#### **30. Fuel System:**

Recommendation:- Replace fuel container with a plastic one or clean and paint container under cockpit sole if none can be found to fit. At same time replace fuel line if replacing container.



**Conclusions:**

Rio appears to have been left for a while unused judging by the growth on the bottom. The removal of the keel is not as big a job as it seems as the keel is not deep. The moisture readings appear to be a common issue with these boats but not a structural one. Internally she is in very good condition for her age and externally one the work has been carried out, she should polish up and be a good little boat for her age.