



Marine Surveys UK

"Pragmatic Surveys in Plain English"

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MCA coding surveyor

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Survey Report no: [REDACTED]

Name of Vessel: "[REDACTED]"

Type of Vessel: Island Packet 320

At the request of:

[REDACTED]

[REDACTED]



This survey was carried out on the [REDACTED] at Emsworth Marina, Hampshire. The above named being the owner 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 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 survey was commissioned to check the condition of the hull below the waterline for moisture content and ingress only and is limited to this.
- ✚ Only the underwater hull and rudder were checked, both externally.

Conditions of Survey:

Vessel was examined ashore having been out of the water for 2 weeks. The yacht has just had a sand / slurry blasting to remove antifouling. The weather was damp on all days of the survey. No special conditions affected the survey other than as described in the text.

Information is reported in the Sections below,

- 1) Brief details of vessel
- 2) Observations below the waterline – construction, tests, findings
- 3) Conclusions below the waterline
- 4) Recommendations



1.Details of subject vessel:

- a) Subject vessel is an Island Packet 320, named Golden Ibis owned by the above mentioned John Baldwin
- b) The Hin number is US-TDL-320 [REDACTED]-IP320. Year of build 2000, model 2001. Serial [REDACTED].
- c) The vessel just been sand and water blasted to remove antifouling.

2. Observations

- a) The majority to the antifouling has been removed, leaving bare gelcoat which is cream in colour and now pitted from sand blasting. The information supplied by the owned from the owners manual is that the hull is solid GRP, hand laid up, alternative layers of hand laid mat and Triaxial roving saturated with vinylester and polyester resin. The gel coat is Polyclad®2.
- b) Polyester resin is a general term used for a variety of resins and not being specific we don't know what standard this particular one is. Vinylester resin is similar to polyester but with superior toughness, elasticity and lower permeability.
- c) The keel is encapsulated type and moulded along with the hull in one piece. The keel is ballast filled, the owner believes this to be lead and I have no reason to doubt this, except on the Island Packet owners website they refer to concrete and iron often.
- d) On the hull there are a few (less than 10) approximately 2mm in size holes in the gel coat.
- e) On the keel towards the aft are a number of larger voids, some as big as 20mm across in a line down the keel both sides.
- f) The rudder has a larger number of 10mm raised blisters, some of which have broken open. On spiking these blisters, brown liquid smelling of vinegar comes out.
- g) The hull and keel was marked out with chalk squares approximately 300mm² so that I could be sure I was checking the complete hull.
- h) The hull was lightly hammer sounded (not heavy enough to damage gelcoat) and did not suggest any delaminating or voids and there are no visible signs of significant damage or repairs. There were, as mentioned above, a few 2mm diameter sized holes which on close investigation with a blade and viewed under 10x magnification had the classic appearance of a broken blister. This is that the void is larger than the hole in the gel coat and the hole in the gelcoat is roughly in the centre of the void.
- i) The keel was lightly hammer sounded also. There are no signs of rust or damage to the underside of the keel or the sides. Areas of the keel do sound like the GRP has come away from the ballast in places and the hammer "bounces" across these areas. They are however the same in the same areas both sides of the keel.
- j) The area where the gelcoat has come off during the sand blast was carefully examined under 10 x magnifications. Some of the voids have filler in them, indicating a previous repair which may have been at build or later. Here the gelcoat has not come off uniformly and the appearance is not of blisters. The GRP under the damaged gel coat does have dry strands of fibre glass all over the surface. I was able to take this back just one layer to solid dark purple GRP. The gelcoat came away easily around these areas.
- k) 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 over the 3 days when the readings were taken were as follows:

Air Temperature:	7° - 11.1° - 13.2°
Surface temperature:	6.1° -10.2° - 12.5°
Relative Humidity:	70% - 77.7% – 70.7%
Time ashore	2 - 3 weeks
In summary the weather conditions for obtaining moisture readings were poor	

Readings were as follows:

<u>Meter</u>	<u>Range below waterline.</u>	<u>Range above waterline.</u>
Sovereign Quantum, 0-100 Shallow mode	18 – 22 with a couple only of 14 & 15 readings	17
Deep Mode	15 – 28	17

The rudder readings were 30 shallow, 19 deep.

The interpretation of the readings in shallow mode range;

- 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.

The higher readings in deep mode were concentrated in certain areas, specifically:-

- along the curve of the hull where it curves under the boat,
- along the length of the keel approximately 300mm up from the base on both sides.
- At the aft end of the keel



- Starboard side keel front top.
- The starboard side hull had slightly higher shallow readings across its length.

I have attached a diagram to the report highlighting the higher readings and copies of the note book with all readings.

3. Conclusions

- a) The rudder does have water ingress which have become blisters. This is currently at a depth of one layer of chopped strand mat below the gel coat.
- b) The hull has some water ingress, not unusual for a boat this age. Minor faults in the moulding process, where the first layer of laminate has had air bubbles in it when laid against the gelcoat have broken. The lay up would appear sufficiently strong and well done that the voids have not been able to increase in size.
- c) The higher readings in the hull around the curve of the hull, I believe is due to the change in thickness of the layup at this point. Inside the boat there is a step in the laminate at this point.
- d) The higher reading along the keel at 300mm are affected by the change in thickness from solid GRP at the base to hollow for the ballast. There could be a layer of moisture below the ballast. Likewise starboard side at top of keel forward above the ballast.
- e) The higher readings at the aft of the keel I believe are true moisture ingress around the stern tube area and skeg fitting.

4. Recommendations

- a) The readings are not sufficiently high, nor backed up by any visible defects in the majority of the areas to warrant removing the gel coat in large areas and replacing with epoxy coatings.
- b) There is moisture present though and applying epoxy over the gel coat in large areas (Copper coat for example) will have, in my opinion based on the research of Bengt Blomberg, an adverse effect and accelerate moisture related problems and cover up any tell-tell signs in the future.
- c) The areas of broken gel coat on the keel and hull should be carefully removed to solid, resin soaked laminates with a sharp chisel or carefully with a grinder, ensuring a tapered outer edge of gel coat and faired with Marine epoxy resin.
- d) The rudder should have its gel coat striped off and back to solid resin. If possible the rudder should be heated up to fully cure any uncured resin. The hotvac system would be suitable for this small area. Any layers of laminate removed should be replaced with FRP cloth and Epoxy resin to replace strength. Each blister could be individually cut out and filled but there are so many, very little gel coat would remain.
- e) The hull should be left out of the water, in a windy position for as long as possible over the winter and moisture readings taken again in the spring to monitor what changes, if any have happened. Primer and antifouling is the only covering recommended.

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