Autoprop, Coppercoat and Strippers.

Impavidus Bavaria cruiser 37 (2015)

When we specified the finish to Impavidus our Bavaria cruiser 37 we decide to include the items we could not easily fit but, leave those we could until we had decided what we wanted and the order of priority. Now that would not suit everyone. If you do not get the time, are miles away from your boat or are not happy with boat DIY then its obvious that you may simply want the new member of the family to come fully loaded or at the very least fitted with the bells and whistles that you want.

We had specified Copper coat on Impavidus. The thought of lifting a 37 footer every year to antifoul and at least once a year to jet off the green, the barnacles and other hangers on, did not appeal to my financial controller. No matter how good Cindy is at antifouling I cannot see the logic in spending a £1000 year in fees and paint just to keep the boat clean below the water line.

Then there is the advantage of having 3 layers of epoxy on your boat before she's even had a look at a boatlift. Epoxy is not hydroscopic like GRP so the boat hull shout remain "dry" for many years.

What is Coppercoat?

From the web http://coppercoat.com/

Coppercoat is the combination of a specially developed solvent-free epoxy resin and high purity (99%) copper. Each litre of resin is impregnated with 2 kilos of ultra-fine copper, the maximum allowed by law, making Coppercoat the strongest copper based anti-fouling available. Indeed no other anti-fouling exposes as much active copper to unwanted marine life.

Unlike many paint companies Coppercoat do not manufacture different types of anti-fouling for different styles of boats and/or particular locations. Instead, Coppercoat is only available in one full-strength hard-wearing version. The epoxy carrier is filled with the maximum amount of copper allowed by law and consequently will keep fouling at bay in virtually all conditions. Furthermore, while the non-eroding epoxy can easily withstand use by high powered motor-boats and racing craft this coating is equally effective on commercial vessels as well as less frequently used and slower moving leisure vessels.

There are also advantages in long term protection of your craft. Glass fiber resins are hydroscopic. Over long term they can absorb water to a greater or lesser extent. Depending in factors such as salinity or water temperature. This can lead to GRP Osmosis. Epoxy resins are not hydroscopic. The treatment is expected to have an effective lifespan of up to ten years. The thickness of the treatment is on average 250 microns and it erodes at a rate of less than 5 microns a year. So the actual lifespan could be much longer.

Impavidus was treated at Osmotec on the Hamble. The underwater sections were abraded to form a key then washed, primed and the Coppercoat applied. The guys at Osmotec were very helpful. The process took about two weeks and arrangements made

Figure 1 abrading the hull

with Steve Gunn at Clipper I was able to make a couple of visits to see the work taking place .

Some of the other extras we had specified were fitted while Impavidus was on the hard.

We went to see the coating after application. The hull was a deep copper colour, smooth and well finished. The waterline was very well defined and the general appearance was good and even, with no pad marks or areas where the support arms had been. There was no overpainting or splatter on the upper hull or topsides. I have to say I was reasonably impressed with the quality of the workmanship. Osmotec gave me a few pointers on care of the finish which generally boiled down to

Figure 2 Copper coat applied

wash it once a year…..

Strippers!

On our previous boat Renovatio (a 2003 Bavaria 32) we fitted a Bunton Autoprop, she already had set of Ambassador Marine's "Stripper" rope cutters. The cutter had been fitted from new. The cutter is made near Winchester and has a number of unique features.

From the web; http://www.ropestripper.com/index.php

"The Stripper is shaped to work like a set of scissors, cutting progressively from the root of the blade to the tip. This produces a very smooth cut reducing impact and vibration on the engine, gearbox and mountings. If the blades where to come together meeting simultaneously along their entire lengths there would be a much greater force required to cut the rope".

There is no chance of the material escaping the cut, or 'striking out' as the teeth will resist any radial movement of free material whilst the propeller draws the material through the cutter. Evidence shows any item being wrapped between the propeller and another part of the boat will be wound tight against the propeller shaft as it rotates therefore there is no escape! Prior to having cavitation control, the blades tapered towards the tip to reducing the cavitation caused by the cutter in front of the propeller. Rope cutters that taper outwards from the root not only produce much greater cavitation increasing propeller wear and reducing performance but are also structurally weaker at the root increasing the risk of blades breaking or bending when cutting dense material.

Figure 3 Stripper blade.

I have had a couple of other rope cutters on other boats a serrated disk and toothed disk. They did two things very well. Firstly the disc cutter managed to trap seaweed very very well. One weekend in Cowes I had to jump over side in my dive kit and cut about 50 kilos of weed away from the prop. The second is collecting blue poly rope and bailing twine. The toothed disk would half cut and half chomp miles of the stuff. Every 3-4 weeks we would be beached on our keels

somewhere taking string and line from the prop and shaft. In the end in both cases I just removed the cutters.

The Strippers on the other hand, make short work of the pot buoy lines around the Bill and St Albans head. Even the mighty French Dieppe guard lines are no match for the stripper. Hence, why when decided to fit a new prop we went straight for Ambassador's finest.

The rope cutter sits between the drive leg hub and the prop. It is behind the leg anode. It comprises of two halves with plastic bearing's One fixed blade is held indirectly to the leg, the other blades are driven the back plate of the prop. The Brunton comes in two variants. A two bladed and three bladed option, dependant on boat size and engine power. We went for the 2 blade and as a result had to fit the two blade cutter to match.

Figure 4 Stripper by Ambassador Marine

The Brunton and Strippers are a matched pair so if you order either 3 or 3 blade you will need to ensure that both companies are aware of the type of prop you have and the number of blades. As the strippers fit in the space between the hub and the prop back plate, they have to take up some of the space used by the leg anode and a spacer that Volvo fit to the output shaft. The cutter replaces the spacer but this requires some precision machining so that the cutter fits snugly into the space.

Figure 5 Two part anode

As a result the anode has to have a hole drilled to take the drive pin and some light machining to the face. You could do this yourself if you have a milling machine, but to be honest it is just as easy to buy the anode pre-cut from Ambassador. Interestingly after years of complaints Volvo have made the latest drive leg anodes in two parts. Now it is no longer necessary to remove the prop to replace the leg anode every year. Then spend the next six months wondering if the shaft nut and cone are going to part company, sending your prop spinning towards the seabed!

Just one other thing to note, if your transferring strippers or props to a new boat;

If you have an older set of strippers or an older prop these have two drive pins in the prop hub, not three as the new ones do. You can see the 2&3 hole set out on the cutter in figure 6 below.

Figure 6 prop, cutter, anode

Brunton Autoprop

http://www.bruntons-propellers.com/autoprop/autoprop.html

There are many propellers on the market. Each on claims to be the best this, or the best that…

Each boat owner will dribble on for hours about how good their prop is so good at this, so good at that, how cheap, never needs maintenance bla bla bla! So with all the stags rutting in the bar; I thought I would start a bit of controversy……..

The Brunton is not the cheapest. It is probably not the most efficient drive prop. There is probably some super lightweight carbon fibre techno wizard's baby, which under full power drives more efficiently. And yes, there is probably a super streamline extra glossy folding prop that you polish before every race, that when closed has a few less Nano Newton's of drag under sail….

Figure 7 Forward Reverse and feathered

However……

There is the "But", and it's a big but. The Brunton performs well in all the categories, certainly where I want it to. When my boat speed drops below 5 knots I generally put the engine on and motor sail or just motor. I find I get the best spot in the marina or anchorage if I am there before dusk, or at least before you….

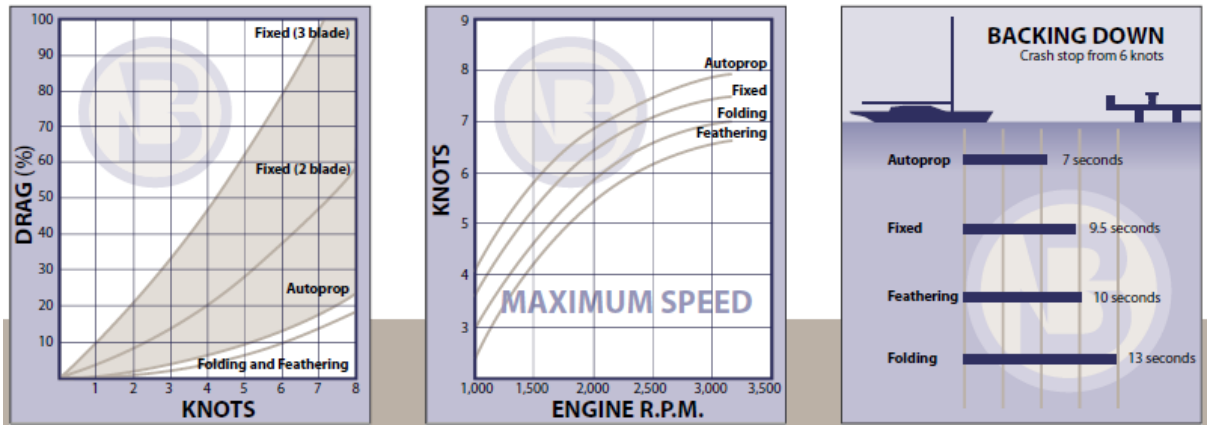
It is very well engineered. There is no compromise to materials, or strength, it's absolutely solid.

The Brunton self-sets, the pitch of the blade changes according to the boat speed, the torque from the engine and the RPM of the propeller. With the Brunton as these variables change the pitch is always kept at its optimum.

Because the blades feather there are no issues with not opening and not closing. Under power and under sail I get much better performance. Especially when punching in to big seas or in rough weather. The Blades are solid sturdy and well balanced. There is virtually no kick with the Auto prop. I don't know why but there is next to none Fwd or Rev which makes berthing in a tight spot so much easier. The efficiency of the propeller is the same in both directions. So in theory you can go as fast backwards as forwards. More importantly you have the same power in both directions. When stopping quickly the prop pitch angle changes and this stops you quicker. Its like the prop has a built in gear box that at slow speed is in 1st gear lots of torque but high revs. At high speed the pitch angle is greater like 4th gear higher speed lower revs. Obviously it is infinitely variable so it has infinite gears. A fixed prop is always a compromise between pitch and power, so can only be in one gear somewhere between 1st and 4th. Importantly in heavy seas the boat gets slowed or gets pushed by waves, the Brunton is always optimised, consequently your boat will not slow to 3 or four knots, it will keep punching through the waves. When your still struggling up the Solent, I'll be in the bar ☺

See it working here; https://www.youtube.com/watch?v=xdxY5Q7wXek

Claimed Performance



Brunton types

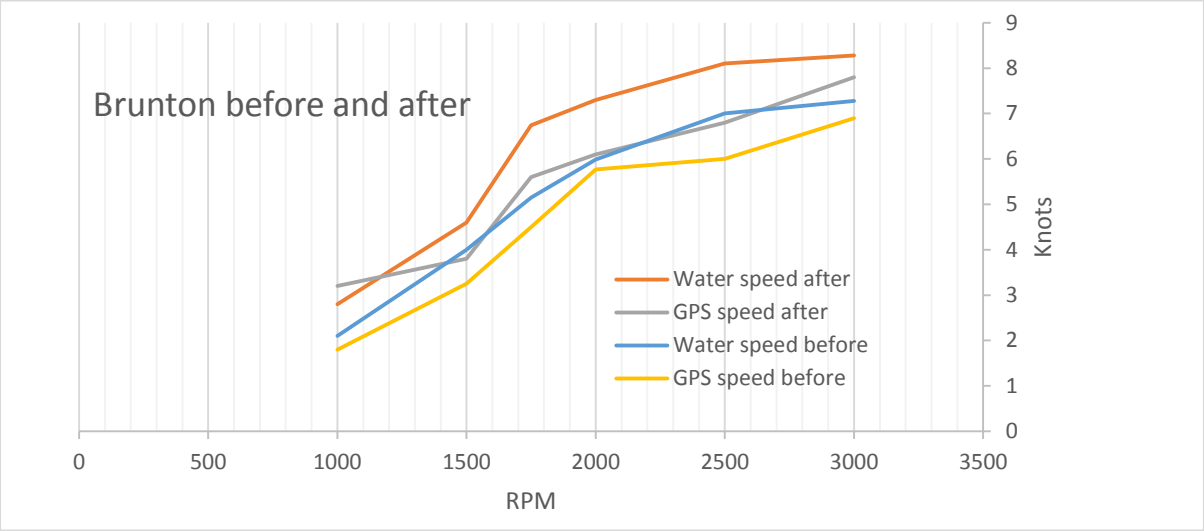
Visit the Autprop website here - www.autoprop.info

The Autoprop feathering propeller for cruising sailing yachts, displacement motor vessels, and hybrid and purely electrically driven craft with engines to 350hp.

There are some performance details shown in the Brunton specs on their web site and in the literature. Generally I find the claims are about right. In fact I did some speed trials to and from the boat lift and the

difference was clear to see. There was little wind but on both before and after runs the tide was quite a bit of tide against us.

Our recorded performance



Important thing to remember. If you spent the same amount on high performance sails you could increase the boats performance under sail by a knot perhaps. But not under power. Spend 75% of the Brunton price on a folding prop and get better sailing performance. But not under power. Get the Brunton Auto prop and get better performance under power and sail.

Out the water

We decided to use the boat lift at Gosport. This was not our first choice. We had arranged to have the boat lifted at Port Solent washed down and we would change the prop at the same time. The cost was £185.00 which I was reasonably happy with. Here comes another " But"……But, when I called them back to confirm the date they decided that this was now a lift and hold and the price was now £280.00 plus vat. This was after the berth holder discount had been deducted. Well that blew the circuit breaker and after a few choice words about daylight robbery and Dick Turpin at least having the decency to wear a mask. I politely declined their quote, and took my custom elsewhere.

The funny thing is, that successful businesses keep their plant busy. It's a big investment and needs to make return. Even a small one rather than just sitting there. It is always better to have your staff working and busy, rather than sitting round the dockside drinking tea. When I see the dockside crane idle most afternoons and a price policy that actually dissuades customers. It makes me wonder if the marina business is just making so much money they really don't care, or they are just acutely inept. Can someone help me down from this soap box? ☺

Bubble lift

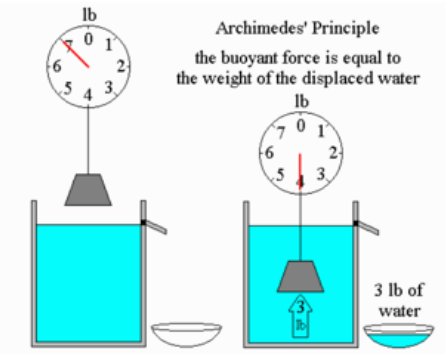
http://www.sealift2.com/

We could have used the scrubbing piles at Hardway or Wicor marine but we did not know how the boat would sit and the tides were all wrong. A call to Boat lift found us the last lift of the day. For £216.00 Inc vat.

Figure 8 on the lift

The boat lift works as a floating dry dock. It works on Archimedes principal, the same law that keeps you boat afloat. There are a number of chambers in the dock that can be flooded with water to partially sink the dock. When your boat is above the submerged dock the vertical legs move hydraulically to support the boat. Air is then pumped into the chambers, displacing the water and lifting the dock and your boat. The volume of water removed is equal to the weight of your boat and the dock.

Here is the principal explained;



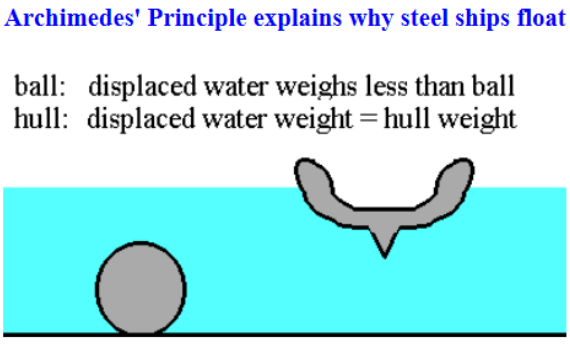


Figure 9 Physics

Out the water

The copper coat has worked well with just a thin film of slime on the hull. This took just a few minutes to remove with the guys from Boatlift using 2 pressure washers. There was very little erosion of the leg anode. However the hull anode was completely gone! Just 6 months seems excessive? But I will look at the cause and remedy in a later article. The other disappointment was the Volvo drive and prop. Neither of which had been antifouled on commissioning. Both of these had some fouling and barnacles. The Prop was removed and I inspected it quite closely. We have had a lot of vibration when motoring, it was only evident when in gear. Shock horror! The centre bush which is held in the hub of the prop was 2-3mm off center and also not in line with the hub. I have put it to one side for now, but I will be looking for Volvo to replace it FOC.

Figure 10 Just a bit of slime

Figure 11 after a quick jet wash.

The old prop removed, The Strippers and Brunton were slid on to the shaft with the addition of a little white grease. The stripper drive bolt heads aligned and the lock nut put on. This nut locks with an M6 hex head cap screw, which is in turn locked with a smaller one locating in a grove machined in the head. These are locked in position with thread lock supplied in the kit. A good tip is to use hex head drivers on a socket extension bar. You can then use a small torque wrench to tighten them.

A quick check and the prop anode can be fitted. I always coat around the anode fixing holes with a self-etch primer and a coat of paint. This helps prevent the anode eroding around the fixing holes. When fitted I splash a bit of anti-foul over the fixing bolts and around the holes, just to be sure.

Figure 12 Ready to go

The guys at the boat wash were great, really helpful. They had a spare hull annode which was bigger but fitted the stud. Within an hour we were being lowered back into the water. We held for a few minutes and with the engine running enguaged forward and reverse a few times to check the prop and cutters were working under load. Before heading back into the harbour for speed trials.

Conclusion

We could have spent the same amount of money that the Brunton and Strippers cost on upgrading to a set of performance sails. But we would have only gained the performance under sail and still not had a feathering prop or rope cutters. Would the extra performance been as good as that of the Brunton? I doubt it. If you have ever had the misfortune to snag a pot bouy or catch a rope you will wish you had strippers. Your emergency lift or calling out diver will justify the the cost and if there is damage done…….

The boat lift was great, good value and you can even stay out over night if needed. The Copper coat is performing well, they even offered to come to the boat lift and check the application FOC. How about that for service?

If you do the maths on all the upgrades the payback times are not too bad. However the value they bring for the crusing boat owner really does justify raiding the piggy bank.

Anthony Kirkby

Vice Commodore BOA