

Antifouling paints are one of the most talked of subjects on and around the water ,the correct choice and application will affect performance, economy and the ultimate enjoyment of your sail, antifouling paint is essential to prevent the build up of marine growth on the areas below the water line.

There is a vast number of antifouling paints available some often working better than others in different environments which depend upon the mooring site of the boat and whether it be fresh water, brackish or salt, warmer southerly waters or colder northern sailing grounds, nutrient rich water run off from farmer's fields or sewage out flows all effect the build up of marine organisms. The regular use of a boat especially a sailing vessel will also have an impact upon fouling( the less a vessel is used the more the growth will take hold)



### Types of Antifouling Paint

The majority of antifouling paints on the market use biocides in one form or another which inhibit and deter the marine growth on a hull.

Since the banning of TBT's (Tributyltin) most antifouls use Cuprous Oxide as the active ingredient this is a water soluble compound which will prevent growth, its effectiveness often depends upon its concentration within the paint and the paint structure itself.

Copper thiocyanate is also used in some antifouling its advantage is that it allows the pigments within the paint to be preserved and is less susceptible to colour change within the water (typically used as a boot top antifoul) It can also be used safely on aluminium hulls and outdrives.

Some antifouls use a mixture of either copper oxides or copper thiocyanate with organic biocides which are included to minimise slime build up.

Antifouling paints are often described according to the paint compound holding the active ingredients:

#### Hard Antifoul

As the name describes the paint dries to form a hard surface these normally use organic biocides which are released through out the period that the boat is in the water. The advantage of a hard antifoul is that it can be scrubbed to remove any build up of growth and is of particular use for racers who need an ultra clean drag free slippery surface with good colour retention. The disadvantage of this type of antifoul is often the costs are prohibitive for the average cruiser sailor.



### Eroding/Ablative Antifouling

This type of paint typically uses copper oxide and is designed to self erode or shed layers of paint releasing the active biocide to the surface, which will occur with water movement. Most eroding antifouls contain Xylene as their solvent. This type of paint is often called nonconvertible (ie it never hardens). Being self-eroding these paints do not withstand much midseason scubbing. There can be a build up of paints over several seasons application which will eventually need to be removed back to the hulls substrate then new layers reapplied. Eroding antifouls can be further split into 2 main types .

#### Semi hard Antifoul

This paint contains natural rosins which will dissolve in the water especially whilst the boat is being used, the semi hard structure of the paint allows for longer periods of exposure to the water and typically contains higher copper loading to maintain its effectiveness for between 18 months to 2 years.



### Soft Antifouling

This again contains natural rosins and a copper oxide content but are designed to last up to a season having a softer paint structure and a lower copper load the paint will have eroded almost completely after 8-9 months. Many manufactures specify these as a “Cruising grade” antifoul.



#### Alternatives to traditional paint antifouls:

There are alternatives to the traditional paint application of biocides these include a copper rich epoxy paint such as copper coat or copper bot and more recently ultrasonic deterrents for marine growth.

The copper coat type system uses layers of epoxy paint (normally 4 or more) with high levels of copper mixed in to it. This can give up to a claimed 10 year foul free period but still requires the boat to be lifted periodically so the epoxy can be sanded to release another layer of copper, so is not a one fix solution. The effectiveness of the system is very dependent upon correct application, environmental conditions and speed of application and may not be for the amateur who has little knowledge of epoxy



paints.

Ultrasonic antifouling has only been on the market within the last few years and does appear to be effective on some vessels but there is limited results to determine its potential.

### **Anti Fouling Removal and Application:**

It is very important to remember that antifouling paints contain biocides used to inhibit marine growth which if inhaled, are poisonous also remember to dispose of any antifoul removed in an environmentally responsible manner. After the initial yard power wash to remove the majority of growth which will harden very quickly once out of the water, there are several options for stripping the old antifoul.

**Wet sanding**, this is probably the most commonly practiced amongst amateur boat users. The correct use of PPE (personal protective equipment) is essential to reduce exposure to the biocides in the antifouling paints. PPE should include a disposable boiler suit with hood, goggles, gloves boots and a dust mask (this should be the type with a respirator and replaceable filter rather than a DIY dust mask). The surface of the boat should be dampened with water and either a hand sander or an orbital sander used. This can be a long and arduous process and requires a love of sanding! The antifoul should be taken either back to the original hull or at minimum sanded to remove any loose and flakey patches of antifouling, failure to do so will seriously effect the performance of subsequent layers of applied antifoul. Before removing the antifoul it is a good exercise to make a note of the water line to ensure the correct height of antifouling is reapplied. Measure down from the deck at various intervals and keep this safe.

**Chemical Antifouling removal paste** is another option. This must be of a formulation designed to remove antifoul paint but not damage the substrate beneath. This is normally a very strong alkali and extreme care must be taken during its application and removal, always consult the manufacturer's health and safety and COSH sheets in the event of exposure to the chemical. The paint is normally applied by a brush in a thick layer and left to soften the paint this can typically take between 24-48 hours, once applied a useful trick is to cover the area with cling film or pallet wrapping to allow the chemical to work down into the layers of antifoul rather than being evaporated off. Once the paste has been left it can simply be removed with a decorator's stripping knife and comes away in long thick strips. Again the disposal of this waste is important as it will be environmentally damaging and your local council or your boat yard should be able to provide the facility to remove the waste.



**Slurry or soda blasting:** This is a mechanical process and must be carried out by a trained professional with experience of antifoul removal. Slurry blasting uses a mixture of fine grit or crushed walnut shells mixed with water to dampen the removed paint. Soda blasting uses a bicarbonate of soda mixture and water. Both are very effective at removing layers of antifouling down to the bare hull and although typically costing £15-20 per square metre can be cost effective and give an excellent starting point from which to antifoul your boat.

### **Antifouling Application:**

Before applying your antifoul ensure that the surface is clean dry and free of any loose or flakey paint. If a boat is wet the antifoul will not adhere to the surface so if necessary towel off with rags, this can be a challenge if antifouling between tides which although possible is not the ideal circumstance to apply the paint. Remember to use Personal Protective Equipment which must include disposable hooded boiler suit, gloves, goggles, boots and an adequate mask (the fumes you may inhale are potentially hazardous). Always read the manufactures data sheets and any relevant COSH materials. Find out from the boat yard or other sailors if there are any specific regulations upon the types of antifoul that is allowed in the area (the Norfolk Broads for example have particular environmental constraints upon the types of antifouling allowed). The disposal of empty tins of antifoul must be done in accordance with local council policy and not just put into the nearest bin!

If you have stripped the previous antifouling back to the bare hull apply a minimum of one coat of an antifouling primer typically this is an aluminium based metallic primer with a xylene solvent, but always check the compatibility of the primer with the antifoul. If you are over coating with antifoul on top of old antifoul spot prime any patches that were wet sanded with a primer. If over coating an existing unknown antifoul always test a patch for compatibility and potential reaction, although most eroding antifouls are compatible some are not and some hard racing antifouls especially the ones containing Teflon based products will not allow anything to stick to them, so if in doubt apply a primer to seal the existing substrate before over coating with your chosen antifoul. Also a word of caution if your boat has had an Osmosis epoxy coating applied to it prior to antifouling this must be abraded to allow the next coat of paint to adhere to it.

Once you are happy with the condition of the substrate painting can proceed. Mask the area above the water line with a low tack tape this should be removed after every paint layer applied especially if there is more than a few hours between applications this avoids the problem of the tape sticking too well to the topsides. The antifoul tin should be opened with caution as occasionally a pressure build up may cause the tin lid to pop off with force spilling paint, exposure to it must be avoided so always wear the PPE you have to reduce contact to skin, eyes and lungs.

The paint must be thoroughly stirred either by hand or preferably with a paint mixer on a hand drill, many copper based antifouls will have settling of their contents the heavier copper sinking to the bottom and the lighter solvents moving to the top.

The paint should then be poured with care to avoid spillage (for economic as well as environmental reasons) into a mini roller tray. A short haired 4" mini radiator roller with an extension handle (to again avoid contact) is preferable to an ordinary 8" emulsion roller as it avoids wastage of the paint and ensures a better coverage.



**Apply the paint evenly onto the hull avoiding overloading the roller, the more time and care taken to apply the antifouling the better its longevity and performance, too often antifoul failure is blamed on the product rather than the actual cause ie poor preparation and application.**

**Be careful not to paint copper oxide based paints onto anodes or any aluminium outdrives, the copper will cause an electrolytic reaction between the two metals and erosion of the softer metals.**

**Read the manufactures guide lines in regard to overcoating times these will vary according to temperature and weather conditions but normaly a paint will take a minimum of 4-5 hours to dry (again allowing between tide application .....but only just).**

**Most manufactures will recommend 2 good coats of antifouling with 3 on leading edges such as the keel and rudder and on the water line this will ensure the performance of the antifoul**

### **Does Antifouling Have a Shelf life/ Use by date?**

Be aware that all Copper Based Antifouling has a shelf life, there are a number of factors that dictate the use by date of an antifouling and it is always worth checking how old the antifouling is when purchasing to ensure that it performs as it should do. Most antifoul has a 2 year shelf life

The main issue that occurs with all copper based antifoulings is that over a long period of time the copper oxide in the can starts to separate and then harden. Once this happens then no matter how much you stir the paint whether by hand or machine you find that there are pea sized lumps of copper contained in the paint that cannot be broken down, when you then go to apply the paint the copper is not being applied correctly and evenly within the paint, the result is the antifouling will not perform as it should, if at all. You may have experienced this problem if you have ever gone to use up an old can of antifouling left over from the previous season.

If you attend boat jumbles a number of stalls may be selling out of date brand leading antifouling very often in rusty cans avoid these, they may appear to be very cheap but they will not perform as they should do.



### **Is copper based antifouling ok to use on my outdrives?**

No you must never use copper based antifouling on your outdrives or any under water metals.. The problems is because antifoulings containing copper and copper is a hard metal this will result in electrolysis (Galvanic Corrosion) on the outdrive.

Electrolysis (Galvanic Corrosion) originates from electrical currents in the water surrounding the boat. Electrical currents in the water are most commonly caused by boats shore power cables hanging in the water, lose wires hanging in the bilge and dock wiring with improper grounding.

If you paint copper based antifouling on to an aluminum outdrive an electrical current will form between the two metal and electrolysis (Galvanic Corrosion) will start to occur when the weaker metal aluminum begins to lose molecules in the water, the electrolysis problem cause by copper antifouls will simply eat holes into the outdrive and eventually destroy the outdrive completely.

When antifouling your boat with copper based antifouling leave a one inch boarder around the gimbal housing of the outdrive to avoid any copper antifouling from touching the aluminum drive and creating a current between the two metals.

### **What can I use to protect my outdrive from fouling?**

As already explained you need to make sure that you antifoul your outdrive with a none copper oxide based antifoul, there are a number of alternatives on the market and not all of them are very clearly labeled. All outdrive antifouls on the market since the banning of TBT now contain a mixture of booster Biocides normaly using copper thiocyanate

We launched our Outdrive Antifouling in a 500 ml Can because we recommend at least 2 coats are applied to ensure none of the active ingredients are depleted early. A 500 ml Can is just enough for 2 coats on a standard outdrive.

Outdrive antifouling may be applied by brush or there are a number of brands that can be applied by aerosol which although this makes application perhaps a little easier the problem with aerosol application is the paint is all too often applied too thinly resulting in the active ingredient becoming depleted early.

### **My antifouling since launching the boat has changed colour slightly why?**

This is a common with all copper based antifoulings, when the boat is launched and the antifouling paint immersed in the water it becomes activated, with the copper ingredient contained in the paint coming to the surface of the paint and starting its job as the active biocide preventing fouling, as a result the copper effects the overall appearance of the colour generally resulting in the colour becoming slightly lighter, the higher the quality grade of the antifouling in terms of the higher the copper content then the more noticeable this may be.

If the appearance of the colour of the paint is absolutely critical around the water line then the only option is to use what is commonly called a boot top antifouling which is a hard scrubable copper thiocyanate based antifoul that contains some booster biocide this is then painted around the first few inches of the water line, mid way through the season you may need to scrub off the boot top because of fouling.

### **Since Antifouling my boat out of the water, strip marks have appeared on the paint why?**

If you antifoul your boat with any copper based antifouling and leave it out of the water for any period of time before relaunching, wet weather may effect its appearance as rain water runs down the boats hull and over the antifouling it will start to activate the copper in the paint, which will start to come to the surface of the paint. Then when boat hull dries off again this will leave behind marks were the copper has started to come to the surface. This is normal and nothing to worry about once you launch the boat and the antifouling in immersed in the water it will become fully activated and the strip marks will disappear with the antifouling all the same colour.

## How soon after antifouling should I launch?

The launching of your boat should be done within 3-4 weeks of application of the antifoul, longer than this and the paint will harden reducing the ability of the paint to self erode and thus reducing the release of copper to the surface and hence reducing the antifouling property of the paint

## Yacht and Motor Boat Antifouling Tips

The most likely reason an antifouling system might under-perform, is that the boat-owner applies it too thinly or skips a coat so that the active ingredient is exhausted early.

Clearly to make sure you have the right amount of paint, it is important to be able to assess the underwater area of a hull. Preferably you want to do so in square metres as that's how most paints are quoted these days.

The formula for doing so is waterline length x (beam + draught) x 0.85 for motor boats, x 0.80 for long keeled yachts and 0.75 for fin keeled yachts.

Most eroding antifouls have a coverage of around 10sqm per litre.

However, as a rougher guide, assuming two coats are required, you could use the following number of tins (2.5 litres):

Length in Ft	Fin Keel	Full Keel	Motor Boat
20	1 tin	2 tins	1 tin
26	2 tins	3 tins	2 tins
30	3 tins	3 tins	3 tins
35	4 tins	4 tins	4 tins
38	4 tins	5 tins	4 tins
44	5 tins	5 tins	5 tins
51	6 tins	6 tins	5 tins

nb: this table should be used as a guide only as hull shapes vary considerably and it's worth erring on the side of caution.

- ! Keep cans of paint indoors until you need them. The paint will be easier to apply if it is not too cold.
- ! Use good quality masking tape to mask off the waterline. A cheaper one could allow paint to creep underneath for a messy finish and might not peel off cleanly.
- ! Choose a dry day for painting. A damp atmosphere can adversely effect adhesion.
- ! Always stir the paint well. And then stir it again before tipping into the paint tray.
- ! Use either a brush or a roller to apply it, but not too large a roller. A short mohair one is ideal (or sponge roller in the case of Premier antifouling which can also be sprayed).
- ! Work the brush or roller in a criss-cross pattern, and don't spread the paint too thinly. Apply an extra coat to all leading and trailing edges, such as the waterline, bow, keels and rudders where applicable.
- ! Do not paint over anodes or transducers