



ABC[®]3 - The tin-free antifouling with a unique track record

Introduction

TBT containing antifouling have been under environmental scrutiny for some years and from January 2003 the International Marine Organization (IMO) has banned new applications. From January 2008 the ban will be extended to prohibit the leaching of TBT antifouling into the environment.

This has meant that marine coatings manufacturers have been forced to develop new technologies to replace their premier antifouling ranges, because they have almost all relied on TBT for fouling control. However, Ameron has marketed high performance TBT-free antifouling for many years. Today, Ameron is the only supplier able to offer economical and proven TBT-free technology that meets both Owners' operational requirements and recent and pending legislation.

This technology is used in Ameron's ABC antifouling range. The premier product, ABC[®]3, utilizes a tin-free biocide package to control shell, slime, weed and other marine growth for in-service periods up to 60 months. The biocide is released in a controlled manner by the polishing action of the antifouling as the vessel moves through water. This polishing effect also reduces hull roughness and drag on underwater surfaces, consistently reducing fuel consumption over the service life of the coating system. The performance of ABC[®]3 is well documented in hundreds of project references and case histories (www.ABC-3.com). For over 20 years it has consistently provided Owners with long-term fouling free performance, rivaling TBT containing materials.

Mechanism

ABC[®]3 is based on unique engineered terpolymer binder technology that provides controlled polishing and biocide release.

- The binder has both hydrophobic and hydrolyzing characteristics.
- The binder's hydrophobic characteristics limit the ingress of water, thus limiting contact of the coating with seawater to a very thin surface layer.
- The coating erodes via controlled hydrolysis of the terpolymer in contact with water. The hydrolyzed terpolymer residue or fragments are washed away by the water movement. The result is controlled polishing. Unlike traditional rosin based antifouling, only a very thin spent or depleted layer remains.
- Controlled polishing or ablation of the binder results in regulated delivery of the biocide package.
- Both the polishing and biocide release rates of ABC[®]3 are self-regulating, depending on the vessel's speed and the trading conditions. This provides the significant advantage that only one formulation of ABC[®]3 is needed for all vessels under all conditions, as opposed to different formulations being required for differing operating conditions.

Binder

ABC[®]3 is not a low-tech rosin-based antifouling. The binder matrix is an engineered terpolymer resin that contains a proportion of rosin as one of several constituents. The terpolymer resin system was designed to provide several key properties:

- good surface tolerance to give excellent adhesion to a variety of substrates and old coatings
- an indefinite recoat window with itself
- a 2-year shelf-life
- easy application without restrictive application and weather condition requirements

This blended terpolymer binder differentiates ABC technology from traditional antifoulings based on rosin alone. It takes advantage of the positive aspects of rosin, whilst overcoming the drawbacks normally associated with these types of materials - short service life, UV sensitivity and no polishing or biocide leach control. The terpolymer binder developed for the ABC range was a quantum upgrade of the traditional rosin binder. This type of terpolymer binder matrix also provides the additional benefit of no maximum time before launching.

An analogy could be made with the internal combustion engine. It was introduced around the time that the first rosin technology was introduced to antifoulings. Indy and Formula I cars still use exactly the same basic technology as the first automobiles, yet we don't equate them to a Model T just because they work on a century old principle.

Biocide Package

In the ABC range, the biocide package that replaces the organo-tin used in the old antifoulings controls, slime, algae and weed growth (like TBT), but also imparts some additional properties:

- controlled solubility that reduces premature depletion of the film and provides increased protection time
- control of barnacle and other shell and animal fouling

Like most effective formulations, the excellent performance of the ABC range is due to the synergistic effect of a series of carefully chosen components. The controlled polishing of the binder results in regulated delivery of the biocide package to the surface of the coating film for maximum fouling control over an extended period. This very controlled release of biocides throughout the service life minimizes the required biocide loading and helps make ABC[®]3 an ecologically sensitive, cost-effective formulation that still provides protection for the specified service life. The theories behind antifouling paints are interesting, but in practice it is performance that really counts.

Performance

Actual service experience is still the only way of being sure that an antifouling meets all the supplier's claims and really provides Owners with value for their money. This experience must be gained under a wide range of operating conditions and on a variety of vessel types over a realistically long period.

ABC[®]3 has been in service for **twenty years** and has consistently achieved **5-years performance** and better under all types of conditions and on a wide range of commercial, military, and recreational vessels. This makes the product unique. There is no other tin-free product on the market with a track record that matches ABC[®]3. It has a loyal following of repeat customers that includes the US Navy and commercial Owners operating on a worldwide basis. It is compatible with most existing antifoulings and its five-year capability is well documented.

Track record

The following are examples of a satisfied customer and typical photos of ABC[®]3 following 5-years in service.

Maritrans Operating Company L.P. is one of many satisfied customers using ABC[®]3:



Maritrans' Vice President, Operations & Maintenance, Mr. Peter G. Nielsen comments:

Maritrans has benefited greatly over the years by the use of ABC[®]3 Self Polishing Antifouling, with excellent service for up to five years. This high level of service being provided by a TBT-free antifouling, without any major environmental impact, has also greatly reduced our routine maintenance drydocking costs. We are particularly pleased to know that we will be able to continue to use ABC[®]3 well into the future as it satisfies pending IMO restrictions regarding the use of antifouling coatings. ABC[®]3 is also helping us to reduce overall painting costs associated with our ongoing double hull conversion projects by reducing the degree of re-painting required with the new hulls. We are confident that our fleet's future operating costs will also benefit from this well-proven technology.

The photos below are of an ultra-large crude carrier coated with ABC[®]3 after 5 years in service. The polishing effect can be clearly seen by the wear-through of the red final coat of ABC[®]3 exposing the blue/gray coat of ABC[®]3 underneath. The presence of only a minimal leached layer is clearly indicated by the bright red color of the remaining antifouling.



The dedicated Internet site www.abc-3.com provides extensive case histories and track records.

Operational savings

A major factor that Ameron has taken into account with ABC[®]3 is cost engineering. The product was formulated and is manufactured to achieve a high **performance: cost** ratio. The liter (gallon) cost of ABC[®]3 is favorable compared with the new tin-free antifouling, but that is just the tip of the iceberg. There are so many other practical factors that play a role in the overall cost. A few of these are:

Application

ABC[®]3 may be applied by airless spray, conventional spray, roller or brush, while some competitive products are really only designed for airless spray application. Some of these products tend to pull or cobweb when applied by brush or roller. ABC[®]3 gives the applicator more flexibility during both new construction and M&R.

Minimum drying time before recoating itself

ABC[®]3 must dry for five hours at 20°C (68°F) before being overcoated with itself compared to twelve hours at 25°C (77°F) for a competitive product. This means that double the number of coats of ABC[®]3 can be applied in a day compared to the competitive product.

Recoat window

ABC[®]3 has an indefinite recoating window with itself compared to twenty-eight days for some competitive products. This allows for unexpected delays during new construction applications.

Minimum time between application and launch

Some competitors need a delay of thirty-six hours between the last application and launch, compared to six hours for ABC[®]3. This can save an entire day in drydock.

Maximum time after application before launch

There is no maximum time after application by which an ABC[®]3 coated vessel must be launched. This gives the flexibility to allow for unexpected delays during construction. This unlimited period compares to a twenty-eight day maximum time before launch for some competing products.

One formula

One ABC[®]3 formula is suitable for all hull areas and services, compared to the two or four different formulas required by many competitors. This avoids confusion, errors and extra stocking costs. ABC[®]3 left in stock is not wasted, because of the long shelf-life and the fact that it can be used on all positions on the hull and for all trading conditions.

Substrate temperature during application

ABC[®]3 may be applied to substrates at temperatures down to -18°C (-0.4°F) compared to -5°C (23°F) for some competing products. This allows for application worldwide at most times of the year.

Material temperature during application

ABC[®]3 can be applied when the material temperature is 5°C (41°F). Other products on the market are more critical. One requires the material temperature to be controlled between 25°C (77°F) and 30°C (86°F) for optimum application. The ABC range is less critical, making application in a wider range of climates more practical and reducing the chance of error.

Volume solids

ABC[®]3 has a volume solids of 52% compared to around 40% for some competitive products. This can mean less coats of ABC[®]3 to achieve the dft needed for five years service. It also enables ABC[®]3 to meet US and other strict VOC limitations.

Shelf-life

Two years for ABC[®]3 compared to as little as three months for some antifouling. Thus using ABC[®]3 reduces the risk of application of antifouling that is over its shelf-life causing early failure or application difficulties.

To summarize, ABC[®]3 does not require extraordinary surface preparation before initial application or subsequent repainting. A five-year service life can be achieved without the application of numerous coats. The controlled polishing action, combined with the antifouling action, reduces hull roughness and drag, increasing efficiency and reducing fuel costs. Thus ABC[®]3 provides owners with major operational savings, because application and drydocking costs are significantly lower than for competitive materials and fuel costs are also reduced.

Conclusions

Most coatings companies have been forced to develop new antifouling based on unproven technology to meet legislation and Owners' current service demands. New tin-free antifouling are being introduced and some of them may perform well, but this will not be certain for some years to come. ABC[®]3 self polishing antifouling is the only material available that can offer the Owner a tin-free antifouling with a well documented five year performance, rivaling that of TBT containing materials. And this without the additional costs, restrictions and risks associated with the use of non-proven TBT-free antifouling technology.

There are few owners in these times who can afford to take the risk of incurring much higher costs for their company by relying upon new and relatively unproven technology when proven and reliable performance is available for much less.

Please refer to Ameron product data sheet and application instructions for specific product use. Contact your Ameron representative for specific recommendations and further information.

Limitation of Liability

Ameron's liability on any claim of any kind, including claims based upon Ameron's negligence or strict liability, for any loss or damage arising out of, connected with, or resulting from the use of the products, shall in no case exceed the purchase price allocable to the products or part thereof which give rise to the claim. In no event shall Ameron be liable for consequential or incidental damages.

Warranty

Ameron warrants its products to be free from defects in material and workmanship. Ameron's sole obligation and Buyer's exclusive remedy in connection with the products shall be limited, at Ameron's option, to either replacement of products not conforming to this Warranty or credit to Buyer's account in the invoiced amount of the nonconforming products. Any claim under this Warranty must be made by Buyer to Ameron in writing within five (5) days of Buyer's discovery of the claimed defect, but in no event later than the expiration of the applicable shelf life, or one year from the delivery date, whichever is earlier. Buyer's failure to notify Ameron of such non-conformance as required herein shall bar Buyer from recovery under this Warranty.

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