AMERON MARINE COATINGS

Ameron ABC3 Self-polishing TBT-free Antifouling

Questions and Answers

Q1
Does ABC3 have any specific advantages over competitive tin-free products?

A1
This could be a long list:

- the only 5-year TBT free antifouling (AF) with proven performance during 20 years service
- 2-year shelf life - there are competitive products that barely manage 3 months
- only one ABC3 formulation is needed for all areas on a vessel
- only one ABC3 formulation is needed for all service conditions
- excellent adhesion to a wide range of surfaces minimizing surface preparation requirements
- compatible with co-polymer chlorinated rubber and vinyl AFs
- it performs well in both static and dynamic conditions
- it performs well in fresh, brackish and sea water
- no maximum time before recoating
- no maximum time before launching
- compatible over sealer coatings applied over TBT

Q2
But surely there are other TBT free AFs that provide 5 years performance?

A2
Well there might be, but no one knows for sure, because the materials are all new and largely untested in service. ABC3 has a proven rack record and that is worth a lot.

Q3
Surely a 3-month shelf-life is sufficient?

A3
No it really is not:

- AF can easily be in storage and transport for six months or longer before it reaches the customer
- sometimes it can be stored at the factory for a few months, transported and then stored again before transportation to the final destination, where it might once again be put into storage for a while
- even if it is delivered to the customer immediately after manufacture there is no room for even small delays in the construction schedule

The consequences of this are that the applicator may be forced into using material that is over its shelf-life, or the work will have to be delayed until fresh material can be delivered. Either scenario is likely to have serious financial consequences. Application of AF that is over its shelf-life may lead to early failure or application difficulties and the use of excessive thinner. Whatever happens it means there is a high probability of problems during application or failure in service and an earlier than planned dry-docking.

Q4
Why is only one ABC3 formulation needed for all areas on a vessel and all vessel speeds?

A4
The polishing rate of ABC3 is less dependent on vessel speed than other self-polishing AFs. Only one formula is needed for vessels of all speeds and all flow rates around a hull. This is not the case with the current generation of self-polishing copper AFs and this has led to the confusion of many different formulations being available for different conditions. This means extra stocking management costs and introduces the probability of errors leading to reduced periods between dry-dockings.

Q5
Why does one ABC3 formulation work for all service conditions – high activity, low activity and in between?

A5
The binder's hydrophobic characteristics limit contact of the coating with seawater to a very thin surface layer. The erosion mechanism is via controlled via hydrolysis of the terpolymer. The fragments of hydrolyzed binder are washed away by the movement of water. This takes place on a microscopic scale and even tidal movement is enough to clean the surface. However the strength of the binder is such that the polishing rate is not greatly increased at high flow rates.

Q6
Why does ABC3 have such excellent adhesion to a wide range of surfaces?

A6
This is a property imparted by the terpolymer binder.

Q7
Why does ABC3 have no maximum time before recoating?

A7
This is another property imparted by the terpolymer binder.

Q8
Why does ABC3 have no maximum time before launching?

A8
The terpolymer binder contains components that are very resistant to UV-light and oxygen. The result is a film that is very resistant to atmospheric degradation. This is a tangible benefit as launching delays can and do occur due to the necessity of completing other repairs or maintenance that may have fallen behind schedule. In addition, by not having a maximum time before launching, only one formula is required for both new building and M&R. Thus the confusion caused by having to select from multiple formulas is avoided.

Q9
Why does ABC3 perform so well?

A9
The excellent performance of ABC3 is achieved through the fine balance of properties imparted by the engineered terpolymer binder. This allows erosion of the coating via controlled hydrolysis of the terpolymer in contact with seawater. The hydrolyzed terpolymer fragments are washed away by the movement of seawater. The result is controlled polishing. This 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 of time.

Q10
Do you have a testimonial from a customer that confirms the good performance of ABC3?

A10
Yes, Maritrans Operating Company L.P. uses ABC3 and the Vice President, Operations/M&R, Mr. Peter G. Nielsen comments:

"Maritrans has benefited greatly over the years by the use of ABC3 Self Polishing AF with excellent service for up to five years. This high level of service being provided by a TBT free AF, without any major environmental impact has also greatly reduced our routine maintenance dry-docking costs. We are particularly pleased to know that we will be able to continue to use ABC3 well into the future as it satisfies pending IMO restrictions regarding the use of antifouling coatings.

ABC3 is also helping us to reduce overall painting costs associated with our on-going 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."

Q11
Is there is any other evidence that ABC3 really achieves 5-year performance?

A11
Check out the references and case histories for this product on www.ABC3.com.

Q12
Competitors' sales staff are telling customers that ABC3 has an inferior performance because it contains rosin. Why shouldn't I believe them?

A12
This is a sales argument sometimes made by companies that have had less success in engineering the proper balance of properties into a complex rosin-containing self-polishing binder. Ameron's engineered terpolymer binder enables the positive characteristics imparted by rosin (like excellent adhesion and overcoatability) to be retained, while certain less desirable characteristics (UV damage, weak film and leach layer) are greatly minimized by the reinforcing action of the terpolymer. These companies may well be trying to eliminate competing products so they can sell new and unproven tin-free products at a very high price. Even if these eventually meet all expectations, Owners will have to hand out a great deal more cash than necessary for a 5-year service life.

The terpolymer binder developed for the ABC range was a quantum upgrade of the traditional rosin binder. An analogy could be the internal combustion engine. It was introduced around the time that 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 because they work on a century old principle. The same analogy can be applied to ABC3 and an original rosin containing AF. The ABC3 binder is a highly engineered terpolymer. It was carefully developed to overcome the earlier problems with rosin.

Q13
They say that rosin is sensitive to sunlight on boottops?

A13
This was a problem with old rosin based AFs. The terpolymer binder in ABC3 is engineered to have a high UV resistance.

Q14
They say that rosin based AFs form a leach layer that stops the AF working after a while?

A14
This was true of some old rosin based AFs, especially the contact leaching AFs where rosin was combined with non-water soluble binders like chlorinated rubber, vinyl or other resins that did not erode and thus formed thick leached layers.

The terpolymer binder in ABC3 has both hydrophobic and hydrolyzing characteristics. The binder's hydrophobic characteristics limit contact of the coating with seawater to a very thin surface layer. The coating erodes via controlled hydrolysis of the terpolymer in contact with seawater. The hydrolyzed terpolymer residue or fragments are washed away by the movement of seawater. The result is controlled polishing. Unlike traditional rosin based AF, only an extremely thin spent or depleted layer remains. This can be clearly seen from the bright red color in the case history photographs taken after long service periods.

Q15
Is there a problem topcoating competitor's tin containing self-polishing AFs? Is a seal coat required?

A15
IMO regulations require a seal coat to encapsulate TBT. Therefore, to limit the leaching of TBT containing AFs into the environment, Amercoat 771 should be used as a sealer.

Q16
They say that rosin is brittle and wears away easily?

A16
Once again this was the case for old rosin based AFs, but in ABC3 the rosin is engineered into the terpolymer and is protected and strengthened by the other binder components. This is no longer an issue as the many case histories of 5-years service illustrate.

Q17
ABC3 is said to be easy to apply by brush roller or spray.

A17
That is correct. ABC3 will not pull or cobweb like other TBT-free self-polishing AFs when applied by brush or roller.

Q18
How can any AF be applied at surface temperatures as low as -18°C (-0°F)

A18
The terpolymer binder was developed so that drying will occur at low temperatures. Note though that the AF material itself must be at 5°C (41°F).

Q19
ABC3 is said to be significantly less expensive that other high performance tin free AFs and yet it performs as well as the best and has a number of other cost reducing features. Why is this?

A19
Due to the very controlled release of biocides throughout the service life, the biocide loading is not more that actually needed and therefore it was possible to make a very cost-effective formulation that provided protection for the specified service life. Also ABC3 has been available for 20 years. All the R&D costs have long since been recovered and manufacturing efficiency was maximized years ago. Only one formulation is required so we do not have to manufacture and inventory many different formulations for different purposes.

Q20
If ABC3 has been around for so long why isn't everyone using it?

A20
The product has been used on many hundreds of vessels and the US Navy is a good customer. Once customers start using ABC3 they become repeat customers. These loyal customers will now be rewarded by the huge savings of not having to remove TBT from their vessels before 2008. However ABC3 was introduced at a period, when the vast majority of the marine market had accepted the marketing position that TBT self-polishing AFs were the way to go. Only a relatively small proportion of the market was prepared to consider alternatives if they wanted top performance. Many were slow to take action, even when it had become clear that TBT would eventually be banned.

Q21
What is the price benefit on a square meter basis?

A21
On a recent project, a direct comparison with a prominent competitor's 60-month TBT-free antifouling on the vertical sides of a vessel showed that the competitor's material was 76% more costly than ABC3. But this is only the tip of the iceberg. See Table 1 for other factors that influence dry docking costs.

The bottom line is:
There are few purchasers in these times who can take the risk of incurring much higher costs for their company by experimenting with untried technology, when proven technology is available for much less.

Table 1

Comparison between Ameron's ABC3 5-year antifouling for M&R and new building of all vessel types and competitor's TBT-free 5-year system for M&R of deep sea vessels only

Property	Ameron's ABC3 self-polishing AF	Competitor's tin-free self-polishing AF	Comments
Volume solids	52%	40%	
VOC (EPA method 24)	399 g/l (3.33 lb/US gal	508 g/l (4.24 lb/US gal)	
Dry film thickness for 5-years	350 microns	375 microns	
Theoretical spreading rate, m^2/l	1.48	1.06	
Price per liter	$9.50	$12.00	
Cost per m^2	$6.42	$11.32	
Service life	Extensive track record of up to 5-years service	Very limited track record	
Shelf life	2 years at 40°C (104°F)	3-months at >25°C (>77°F) 6-months at ≤25°C (≤77°F)	Some of competitor's material is certain to be lost when dry docking in warm climates
Dry to recoat time	min. 5 hr at 20°C (68°F)	min. 12 hr at 25°C (77°F)	
Maximum recoat time	None	28 days with itself	
Minimum time to launch	6 hr at 20°C (68°F)	36 hr at 25°C (77°F)	
Maximum time before launch	none	28 days	
Minimum application temperature	-18°C (-0.4°F)	-5°C (23°F)	Restrictions on use of competitor's product at this -5°C (23°F)
Material temperature during appln.	5°C - 35°C (41°F - 95°F)	25°C - 30°C (77°F - 86°F)(optimum)	
Airless spray application	Ok	Ok	
Conventional spray application	Ok	Not suitable	
Brush application	Ok	Small areas only	
Roller application	Ok	Small areas only	
Maintenance and repair	Ok	Ok	
New construction	Ok	Another formulation required	

The ABC3 datasheet and application instructions are straightforward. The competitor's AF range is complex and confusing relating to the use of various formulations for new building and M&R as well as various trading patterns. In addition their various recoating and dry times at various temperatures increase the opportunity for error. *ABC3 is a practical product that is straightforward to use, completely suitable for its market and proven in use in that market.*