



CASE STUDY

Stolt Creativity - 4 special surveys
without any need for ballast tank
maintenance

Summary

In July 2017, the water ballast tanks of **Chemical Tanker Stolt Creativity (IMO 9102095)** were inspected as part of our ongoing project with Stolt Tankers BV to monitor the corrosion protection of the specified coating system. The Stolt Creativity is from a very significant series of seven D37 vessels, where we partnered with Stolt Tankers for coatings from the newbuilding stage.

In 1997, the Stolt Creativity was launched from Danyard, Denmark, the third in a series of 37,000 DWT Chemical Tankers. Initially built for the global chemical trade, the vessels were built to an extremely high standard and critical to the design specification was the need to provide water ballast tank protection for 25 years. In fact it was highlighted on Page 1 of the Owner's specification that "the intention is a 25 years lifetime".

The 1990s was a period of transition in terms of the types of coating specified. IMO resolution A798 (19), adopted on 23rd November 1995, mandated guidelines for the selection, application and maintenance of corrosion prevention systems in dedicated seawater ballast tanks - critical vessel areas that can have a huge effect on a vessel's structural integrity and long term asset value.

Stolt Tankers B.V. were one of the leaders in the adoption of good anticorrosion protection practices and were insightful enough to insist on the specification of >9% Aluminium pigmented abrasion resistant pure epoxy anticorrosive (Intershield® 300) to deliver on their performance expectations. This was a bold decision at the time due to the increased investment needed, but this decision has been repaid many times over with zero repairs needed in the first 20 years' service.



Challenges

Water ballast tanks are an integral part of the operations of most commercial cargo carrying ships. Although these areas are not specifically revenue earning, the protection of these large areas is very important. If left poorly protected the resulting corrosion can have a negative impact on the value of a vessel. It could, in some cases, result in the need for expensive, complex maintenance and steelwork replacement and in extreme cases could result in structural integrity failure in-service. Whilst the outer hull, external deck and super structure can be routinely visually inspected to ensure a 'good' appearance; lifting the hatches of the water ballast tanks is not as routine and is often done with trepidation. Reducing this worry is possible throughout the lifetime of the vessel if the owner has peace of mind that the best available coating technology had been applied at Newbuilding. Prevention of

corrosion is one of the most important aspects of maintaining vessel safety together with preserving asset values. Water ballast tanks are unique environments and what the coating system is exposed to depends on whether the vessel is fully laden or in ballast or partially ballast conditions. It is often wrongly assumed that corrosion is only an issue when the water ballasted tanks are full of sea water. In fact, partially filled tanks cause just as much an issue if not more. The upper coated surfaces including the deck head are exposed to warm humid salty conditions which being fully aerated are perfect for highlighting and exploiting any weakness in the coating system. In these conditions, the zinc anodes of a cathodic protection system that are often used to assist in the corrosion protection are ineffective as they are not immersed in the sea water electrolyte.

How We Made It Possible



In 1996, Stolt Tankers B.V. made an investment decision to build 7 new vessels for the global chemical trade. As these were to be long term investments with the intention of being owned and operated by Stolt throughout their life-time, a pragmatic discussion was held between the newbuilding team from Stolt and AkzoNobel.

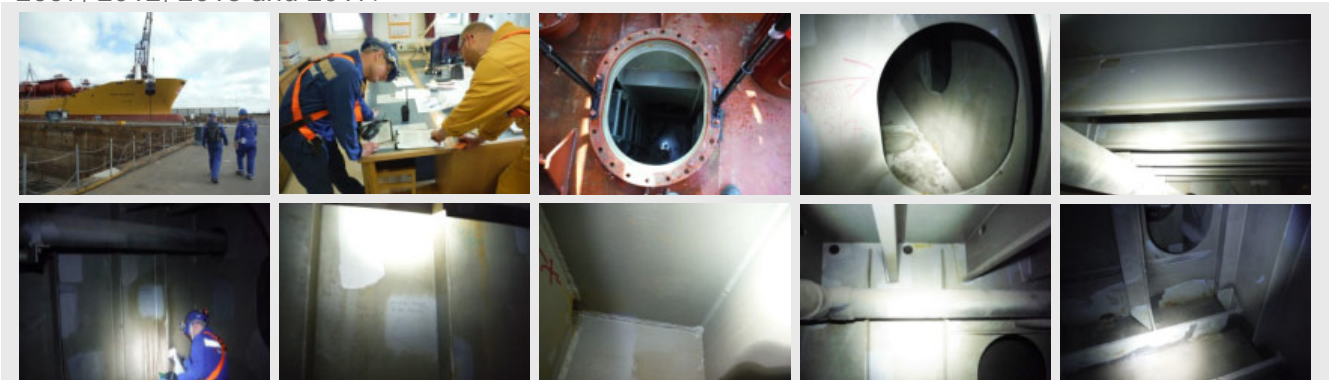
Concerned about the then existing approach to water ballast tank protection, the Stolt Newbuilding Manager at the time challenged internal perceptions and also challenged us to supply whatever it takes to provide the level of protection specified. Protection for 25 years was only an ambition for owners in those days even though we had been trying to change the industry's views on the importance of "getting it right" at Newbuilding. Intershield 300 was specified at 2 x 150 microns and although this was a significant upgrade, Stolt Tankers confidently agreed with the condition that we worked together to prove performance.

Since the launch of the vessel, we have routinely visited Stolt Creativity to monitor the condition of the water ballast tanks and to help to provide proof of our 25 years protection promise.

Results, Return on Investment and Future Plans

In 2015, we commissioned DNV-GL to carry out a full inspection to give some independent objectivity to our inspection programme. Kieron Kilroy, Principal Coating Engineer said that "With coating material costs still relative to those 18 years ago, but application and repair cost of a much costlier order today, it is clear from the controlled applications of such higher specification products, eventually requiring such minor maintenance has proven an economical but effective asset protection system in this case."

'Stolt Creativity has had minor maintenance and repair since it was delivered thanks to good condition in ballast areas. The condition of 'Good' has been confirmed when vessel dry-docked in 2001, 2007, 2012, 2015 and 2017.'



Stolt Tankers themselves are extremely pleased with the condition of these vessels and were particularly proud to see the results of the 20 year inspection of the Stolt Creativity.

David McKellar, the Stolt Tanker B.V. - Fleet Manager European Fleet said "Stolt has particularly high standards when it comes to coating application and we wash down the tanks frequently during service but it does appear that Intershield 300, when applied correctly, is probably going to last 25 years. Intershield 300 is a great product that has saved us millions of dollars. We invested at newbuild of the vessel and saved in the long run. There has been little maintenance required over the lifetime of the vessel."



Stolt Creativity is one of a series of seven D37 chemical carriers designed for the global chemical trade. All the vessels in this class were coated from newbuilding with Intershield 300 (2 X 150 microns in ballast area) to achieve the same goal of '25 years lifetime'.

Myth-buster

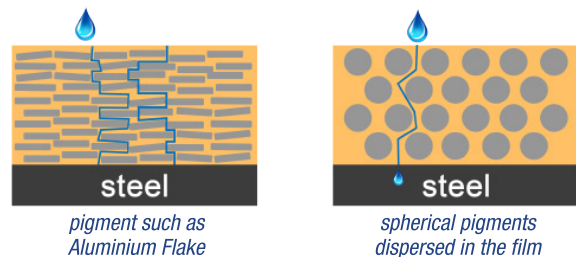
Do all products with 9% Aluminum pigmentation perform the same?

Simply adding Aluminum, even at high levels, to an epoxy coating does not mean that it will have the same anticorrosive performance as Intershield 300. The formulation of Intershield 300 using Aluminium does contribute to the excellent anticorrosive performance of the system but it is not the only aspect that makes Intershield 300 unique.

Intershield 300 provides a balance of abrasion and corrosion resistance with the optimum levels of hardness and flexibility for long term performance. It is designed to provide durable corrosion protection and minimize maintenance expenses while maximising long-lasting asset protection.

Barrier Properties

Abstract of water penetration; high density of aluminium pigment for Intershield® 300 vs Non-Aluminium pigmented competitors' film cross section



Intershield® 300	Competitor A	Competitor B
Microscope magnification x 200		
Microscope magnification x 500		

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