Titanic's Antifouling Paint

By Bob Read, D.M.D.

Introduction

The purpose of this article is to document the type of antifouling paint used on Titanic and to try to determine a close approximation of the color of this antifouling paint.

Titanic's Antifouling Paint Composition

In the early days of the development of antifouling paints, very few patents were issued up to 1830. By 1867 over 300 patents had been issued. Titanic used a specific patented antifouling paint. In the early patents, the most frequently specified toxics were copper, arsenic, mercury and their various compounds. The Suter Hartman Rahtjens formula was a shellac type paint, using mercuric oxide and arsenic as the toxics and was patented in 1871. This formula was also an anti-corrosive. The use of shellac as a rust preventative coating for ships' bottoms reduced the corrosion to an extent that in 1861 Admiral Halsted stated that corrosion was no longer important.

Shellac is a resin secreted by the male lac bug in the forests of India and Thailand. It is processed and sold as dry flakes and is dissolved in alcohol to make liquid shellac.

The Color of Titanic's Antifouling Paint

The specific color of Titanic's Suter Hartmann Rahtjens antifouling paint is a function of the individual ingredients. Figure 1 shows the appearance of powdered mercuric oxide.

Figure 1

Mercuric oxide

Figure 2 shows the color of powdered arsenic.

Figure 2

Arsenic

Figure 3 shows shellac flakes.

Figure 3

Shellac flakes

Go to next page

Figure 4 shows a range of variation of shellacs applied to wood.

Figure 4

Range of shellac shades

So, with the possibility of a variation of the color of most of the ingredients in the Suter Hartmann Rahtjens paint formula, it is not possible to determine the color just from the ingredients. Additionally, mercury based antifouling paints are no longer legal so we can't look at contemporary examples.

Modern antifouling paints have a considerable variation in their colors as can be seen in Figure 5.

Figure 5

Variation of modern antifouling colors

With this much variation in modern antifouling colors, it is reasonable to believe that in the era before color photography that with hundreds of patented formulas that there was a similar variety of colors of antifouling paint.

For all of Titanic's paint colors, modelers and artists have always lamented: "if only we had a paint sample from the wreck!" The truth is that we have recovered at least one paint sample from Titanic's wreck and modelers and artists have largely rejected applying it where it was intended.

In the early 2000s one of Titanic's officers' quarters windows was recovered. It was a brass framed window which still had some adhering paint. Over a period of a year conservation techniques were performed on the window. Figure 6 shows the window before conservation procedures on the left and after these procedures on the right.

Figure 6

Before and after conservation procedures on

Titanic officers' quarters window

Figure 7 shows a close-up of the restored paint adhering to the window frame.

Figure 7

Restored paint on Titanic's

Officers' quarters window

From other evidence we know this color to be "dark mast". For a full examination of is color, it was described here: Examination of the Color Dark Mast

For almost all colors we have found on Titanic, the appearance of the colors is much darker than the original. White painted deckhouses appear brown. The color “dark mast” also appeared very dark until it was restored. This dark color probably has two causes. First, the darker colors of paint all exist on steel surfaces where there has been the formation of rusticles. Second, over time the accumulation of different types of accretions formed on the surface of the painted surfaces.

The exception to the extreme darkening of these painted surfaces has been found to be on the surfaces painted with antifouling paint. Figures 8 – 10 show several photos with acceptable lighting clearly showing antifouling paint on Titanic’s hull.

Figure 8

Titanic antifouling paint

Figure 9

Titanic antifouling paint

Figure 10

Titanic antifouling paint

In all of these photos we can see that within the paint is the formation of rusticles emanating from the underlying steel. This rusticle formation may affect the color of the paint in the photos.

If these photos of antifouling paint in various lighting conditions were our only evidence then there may be a lot more doubt about the color of Titanic's antifouling paint. Fortunately, we have a near pristine example on Titanic's port wing propeller.

One of the aspects about the best antifouling paint photo we have is lighting. There are many photos of Titanic's wreck but not all of them have full spectrum lighting. By that I mean color photos with lighting which reflects all the different colors. An example of the difference is seen in Figure 11 which shows two photos of bronze topped capstans. In the one with less than full spectrum lighting the bronze top of the capstan appears like steel. In the other photo with a broader spectrum lighting we can see the warm bronze color of the top of the capstan.

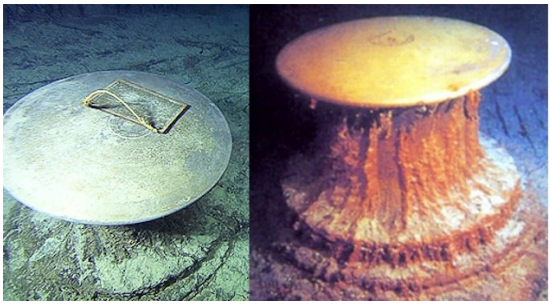

Figure 11

Titanic capstans in different lighting conditions

The most ideal photo we have of antifouling paint at this time can be seen in Figure 12.

Figure 12

Antifouling paint on Titanic's port wing propeller

The advantage we have in this photo over some other Titanic photos is that the lighting is good, showing a range of colors and the paint is applied to a surface that is not prone to rust. The wing propeller is manganese bronze and shows virtually no oxidation. If it had oxidized, it would have a verdigris patina. But in the photo the blade is almost pristine bronze. The portion of the propeller which has antifouling paint on it has a uniformly smooth surface which is free from any rusticle contamination which could cause the color to be darker.

At this point there is usually an objection about the paint having been submerged for over 100 years and this must have caused the paint to fade. My response to this argument is that fading of paint happens when it is exposed to UV rays. At Titanic's depth it is not exposed to any UV rays because sunlight does not penetrate to this depth. Second, as we have seen with paint on painted steel surfaces, the paint uniformly darkens which is not the case here with the antifouling paint under ideal conditions.

Go to next page

Conclusion

If one looks at photos of Olympic or Titanic in drydock, the shade of the antifouling paint looks fairly light even with blue sensitive black and white film of the period which would make red colors appear darker. I believe that the mid-range of color for Titanic's antifouling paint is very near to the color seen in Figure 13.

Mid-range color of Titanic's antifouling paint

This sample, I believe, is well within the range of this color and is the one I would personally use on a Titanic model.