



Two ways of overcoating of World War II free-weathered weapons (an anti-aircraft gun and a searchlight) with a paint system for offshore wind farms.



On the Belgian coast in Ostende on the site of the "Atlantik Wall Museum" some WWII weapons are exposed in the dunes. Due to the constant attack of salty sea atmosphere and the abrasion by sand and wind the objects are strongly exposed. The corrosion and destruction is well advanced. However, the museum wants to keep the objects and continue to present them in the dunes. The challenge in the restoration was to preserve the objects as far as possible original, if necessary to stabilize and then preserve by an additional coating for as long as possible despite the unchanged weather conditions. The coating was analyzed microscopically by means of cross sections and color staircases and the coating composition compared with coating colors of the Wehrmacht. During the disassembling of the searchlight and the anti-aircraft gun, the first predictions of color analysis changed. Under seals and flanges appeared the paint layer which could be the original colour. Color examinations resulted in nine to eleven layers of color in case of the searchlight. The anti-aircraft gun and the special trailer had only three to four color layers.

In the further investigation, the impression solidified that the anti-aircraft gun was processed some time ago. Repairs were found that unfortunately worsened the condition dramatically as they were, well meant, made of stainless steel. Some flaps were sealed with silicone and the seat was mounted upside down. It was obvious that the whole treatment was done shortly before it was sold to the museum (around 1990). The layers of paint were not original, otherwise there would have been more than three. The topmost layer of paint was very thin and had no good adhesion to the ground. Then we decided in cooperation with the museum that the coating of the anti-aircraft gun is removed by sandblasting. So problematic areas could be better recognized and treated. After derusting with a needle scaler and blasting, the old restorations were removed and imperfections could be closed.

With the searchlight, we decided on a different path. Here it was clear that the coating is original and there was also a good connection with the lower layers of paint. Judging by the condition, the object had never been restored except for a fitted cap. The entire color spectrum since production was available and readable. The material thickness of most of the parts was a lot stronger than on the anti-aircraft gun. And after the removal of the corrosion it remained often still enough substance for a conservation. Nevertheless, the structure had to be worked up, due to the lack of carrying capacity. We had to cut out the holes and weld in new patches. Sheet metal work had to be carried out in many places. Corrosion products that could not be removed with the needle scaler or mechanically were thinned with a sandblaster with glass beads 70 – 110 µm. When glass beads are used with little pressure they do not damage the existing paint layers but smoothen and densify the surface. With this treatment we were able to preserve the well-adhering old coating on approx. 85% of the surface. Thus, the existing paint layer thickness of 300 to 400 micrometer could be obtained.

When researching possible coating systems, we came across the Offshore Norsok Standards. This International Standard specifies the requirements for the selection of coating materials, surface preparation and application methods for protective coatings of offshore installations. The coating should be low maintenance but also

meet the requirements of rough sea weather. This corresponds exactly to the points we would like to have as object protection.

The Norosk standards are now integrated into DIN EN ISO 12944 as category Cx. In the case of an offshore coating (Cx), however, surface preparation with blasting to SA 2 1/2 and a zinc dust primer is always mandatory. This is not desirable in the case of the searchlight because of its well-adhering old coating. Since a zinc dust primer does not combine remnants of old coating, a different primer had to be used here. But for the anti-aircraft gun a coating with this standard would be possible. The layer structure could then be carried out with the Sika Permacor system.

Unfortunately, it turned out that these colors are not made in very small quantities (Minimum 20 kg)

So we had the opportunity to coat the searchlight according to category C5 (for the onshore area). In the end this also corresponds to the actual location of the object. The museum has asked for a glossy finish on the top coat because they have gained good experience with other weathered restored objects. The gloss gets lost soon, but the surface is more stable. After priming, all slots and gaps were sealed with a sealant.

Some missing parts on the visor as well as destroyed plastic buttons were recorded on other intact identical objects with 3D Scan. The models could then be reproduced using the 3D printing process. They were colored, marked and installed. All in all, the searchlight and the flak were well prepared for the next few weathered years on the museum grounds.

Gesa Witt

TriKonBerlin

Biesenthaler str. 7

16230 Sydower Fließ

www.trikonberlin.de