NANO-CLEAR INDUSTRIAL COATING FOR OXIDIZED MARINE ASSETS

Schooner Creek Boat Works
Portland, OR

Industrial Customer:
US Department of the Navy

Project:
Restore and protect fiberglass lifeboats and rescue boats.

Project Location:
Portland, OR

Applicator:
Schooner Creek Boat Works

Coating Formulation:
Nano-Clear Industrial (**NCI**) coating

Application System:
HVLP

Date:
Application: 22 July 2016

Conditions:
Temperature - 75F
Relative Humidity - 58%,

PROJECT OVERVIEW:

The US Department of the Navy – Military Sealift Command has highly oxidized fiberglass lifeboats and rescue boats that need to be restored. These are valuable assets in terms of both cost and sailor safety so a robust, reliable, uncompromising solution was required. In addition, the Navy needed a long term protective coating solution that would reduce maintenance cycles, effectively paying for the coating.

The lifeboat and rescue boat (shown in this report) had become degraded from UV and saltwater exposure. The fiberglass was heavily oxidized. Wax and buffing is not providing protection from the destructive elements in the severe service environment these vessels are operating in. The Navy specified Nano-Clear Industrial coating and Vigor Marine contracted Schooner Creek Boat Works to do the work.

The exterior of each boat was prepped prior to application of the **NCI**. **NCI** was spray applied to the entire exterior of the vessel. The bottom half was sprayed first and allowed to cure. Then the top half was coated.

NCI will provide 5+ years of protection, eliminating an estimated three maintenance cycles, saving significant maintenance costs.

Applications:
Fiberglass assets - rescue boats, lifeboats, fire station boxes, enclosures, covers, etc.
Painted surfaces – bridge/superstructure, funnel, rails, bulwark, hull, communication towers/enclosures, pipe, containment pans, support structures, signs, buoys, etc.

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CURRENT SITUATION:

The lifeboat and rescue boat had become oxidized and degraded. The gel coat on fiberglass is susceptible to UV oxidation and salt water degradation over time. By the very position these boats occupy on a ship, they are directly exposed to continuous UV radiation and salt water. Allowing the degradation to continue would have compromised the integrity of the lifeboat and rescue boat which was not an option as people's lives depend on that boat in emergency situations.

Before **NCI**

Maintenance is a significant portion of any activities' budget in terms of materials and labor. **NCI** was specified as an effective coating solution to restore the fiberglass gel coat surface and provide long-term protection on the ship's lifeboat and rescue boat. Incorporating **NCI** will reduce the number of frequent maintenance cycles currently needed to keep these assets in acceptable working condition.

After **NCI**

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ISUSA SOLUTION:

NCI - a crystal clear, aliphatic (UV stable), moisture cured, one component polyurethane/polyurea hybrid formulation with extreme cross-link density for UV, salt water, chemical, and abrasion resistance.

NCI is formulated to penetrate and fortify *existing* paint & weathered fiberglass systems (newly painted or highly oxidized), *not* replace them.

NCI is an evolution in cross-linking formulation technology. This cross-linking creates a "tough" coating that combines with existing gel coat and paint systems forming a long lasting protection solution.

NCI chemically bonds to the gel coat and paint with adhesion promoters and also bonds mechanically by penetrating into the porosity of the underlying coating.

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APPLICATION:

Preparation:

- The surface was washed with a phosphate free, biodegradable detergent (such as Super Clean) at the concentration recommended by the manufacturer and water using a soft/medium bristle brush prior to sanding the surface.

- Then the surface was rinsed with water and a soft/medium bristle brush similar to the one shown. Alternatively, using a pressure washer and a sponge to remove debris and contaminants is acceptable.
    - Using a brush or sponge in tandem with water is highly recommended to ensure contaminants and debris are removed from the substrate surface.

- The fiberglass was cleaned with acetone using plenty of rags. When the rags become loaded with oxidized material those rags were retired and replaced with clean rags.

- After the fiberglass was cleaned it was dry sanded using an orbital sander and 400 grit sand paper. In difficult to reach areas, a gray Scotchbrite pad was used to abrade the substrate.
    - The objective is to remove wax, contaminants and oxidized material/debris from the fiberglass substrate without breaching past the gel coat layer into the fiberglass.

- When the substrate abrasion was complete, the entire lifeboat was cleaned with acetone.

Application:
To obtain the best, consistent finish, the **NCI** should be applied using an airless sprayer or HVLP gun and two wet-on-wet coats of **NCI**..

- In general, coat a section of the existing gel coat/paint with **NCI**, ensuring all areas of the prepared surface are “wet” with the **NCI**.
- Then coat an adjacent section.
- While the adjacent section is being sprayed, the previous section will have time for the some of the solvents to flash off.
- Go back to the previously coated section and apply another coat of **NCI** spraying in a cross-hatch direction.
- Go to the adjacent section and apply another coat of **NCI** spraying in a cross-hatch direction.
- Repeat this procedure section by section.
- Once an acceptable finish is obtained stop applying the **NCI** and allow it to “level”. Because of the low viscosity of **NCI** (100cps) the finish will “level” out.
- Apply the **NCI** from the top of the asset working down to the bottom.
- It is important to watch the previous section you have applied the **NCI** to because on prepared oxidized substrates the **NCI** will absorb into the oxidized surface at different rates. When certain areas absorb more of the **NCI** than other areas simply go back and apply another light, “wet” coat of **NCI** to even the finish.

NCI is a moisture cured (humidity cured) formulation – the higher the temperature and the higher the humidity the faster the cure.

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SUMMARY & CONCLUSION:

1) **NCI** was applied to an oxidized fiberglass lifeboat and oxidized rescue boat to restore and protect it from degradation and to reduce maintenance cycles.

    a. **NCI** penetrated and fortified the gel coat resulting in a protective coating *system* that:
        i. Exhibits much better physical properties than the original gel coat alone
        ii. Enhanced the original safety color
        iii. Extends the protective service life for many more years
        iv. Saves several maintenance cycle costs (money and labor resources).

    b. **NCI** does not replace gel coat or paint systems; it is formulated to work *with* them - **NCI** is the economical solution *to extend the performance life* of those systems.

2) **NCI** is easy to work with by personnel with wide-ranging skill levels.

    a. **NCI** is a one component coating.

    b. **NCI** requires no mixing or thinning.

    c. **NCI** is crystal clear so only one product is needed to protect all assets regardless of color.

3) The timing of **NCI** application.

    a. **NCI** can be used on newly painted surfaces.

    b. **NCI** is formulated to also work on oxidized painted and fiberglass surfaces. The objective is to use **NCI** before the oxidation degrades the substrate or allows corrosion to commence.

NCI Saves Money:

- **Prevents premature gel coat and paint failures**
- **Eliminates substrate preparation time required for new gel coat/paint**
- **Saves gel coat, primer and paint material costs**
- **Reduces labor costs**

Incorporating **NCI** into the Navy maintenance protocol will extend the service life of all assets and save significant money over the service life of the lifeboats and rescue boats.

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