

## Coating Systems for Aluminum Underwater Hull Surfaces



High Speed Vessel SWIFT (HSV 2), an aluminum-hulled catamaran.  
U.S. Navy photo by Photographer's Mate 1st Class Michelle R. Hammond

**General Overview:** Coating systems discussed in this section are designed for application on aluminum underwater hull surfaces of U.S. Navy vessels. The underwater hull area is subjected to the harsh corrosive environment of seawater and constant attack by marine growth. Coating systems must not only hold up in this corrosive environment, but also must keep the hull free of fouling, which reduces speed and fuel efficiency. Navy and commercial dive activities accomplish hull coating touch-ups, repair, and underwater hull cleanings. Major repairs and complete refurbishment of the coating system must be accomplished in dry dock during maintenance availabilities.

During new construction or for complete re-preservation work, aluminum underwater hull surfaces are prepared by blasting to near white metal using garnet or aluminum oxide or water jetting to NACE 5/SSPC-SP 12 condition WJ-2L. For touch up work, the anti-fouling topcoat is removed to sound primer by light abrasive blasting with black walnut shells. Following appropriate surface preparation, the aluminum underwater hull is coated with an anti-corrosive primer and then an anti-fouling topcoat.

### Surface Preparation Requirements:

- Near White Blast Cleaning using garnet, aluminum oxide or black walnut shells
- Waterjetting to NACE 5/SSPC-SP 12 Condition WJ-2L

### Applicable Coatings Specifications and Approved Coatings:

#### Anti-Corrosive Primer Coatings

- [International](#) Intergard 264
- [E-Paint](#) EP Primer 1000 (Embarked Boats and Craft Only)

**Intermediate Coats:**

- [International](#) Intergard 264
- [International](#) Intersleek 381
- [E-Paint](#) EP Primer 1000 (Embarked Boats and Craft Only)
- [E-Paint](#) SN-1 (Embarked Boats and Craft Only)

**Topcoat (Keel to Bottom of Boottop)**

- [International](#) Intersleek 425 Haze Gray
- [E-Paint](#) SN-1 (Embarked Boats and Craft Only)

**Topcoat (Boottop)**

- [International](#) Intersleek 425 Haze Gray
- [E-Paint](#) SN-1 (Embarked Boats and Craft Only)

**Topcoat (Draft Markings)**

- [International](#) Intersleek 425
- [E-Paint](#) SN-1 (Embarked Boats and Craft Only)

**Struts, Rudders and Other Erosion-Prone Areas****Anti-Corrosive Primer Coatings**

- [International](#) FPL 274/FPA 327
- [Ameron](#) Amercoat 235

**Intermediate Coats:**

- [3M Co.](#) EC-2216

**Topcoat**

- Antifouling paint same as surrounding paint

**Note:** Additional approved coatings may be listed in periodic NAVSEA Approved Coatings messages located on the Navy Community main page.

**U.S. Navy Guidelines and Instructions:**

**Coating Application Process:** Preservation Process Instructions (PPIs) were developed by NAVSEA 05M to document the latest requirements and procedures for coating applications. These documents contain information on cleaning, surface preparation, coating application, quality assurance requirements, checkpoints and QA inspection forms. The applicable PPIs for underwater hull surfaces are linked below.

**Preservation Process Instructions:**

- [PPI 63101-000](#) CORE
- [PPI 63101-015H-A](#)
- [PPI 63101-015H-B](#)

**Key Application Requirements:**

Key application requirements to be used during preservation practices are referenced in a variety of document sources. These parameters should be considered and monitored during all preservation practices to assist in ensuring the longevity and service life expectancy of a coating. The requirements specified in the job order, ship specifications, 009-32, NSTMs, PPIs and additional repair documents have been tested and have proved the most effective measure to ensure coating service life. Some of the requirements referenced include environmental and quality assurance monitoring such as dehumidification, temperature, surface profile measurements and coating thickness measurements. **For more information on these parameters, see [Key Application Requirements](#).**

## Repair Requirements:

**Ship's Force:** Ship's force personnel do very little underwater hull repair work. Normally, divers inspect coatings prior to maintenance availabilities. If warranted, repair and replacement is conducted by repair activities. Naval Ships Technical Manuals are the primary source of information for ship's force personnel. The applicable Chapters for surface ship preservation are listed below.

Naval Ships Technical Manual (NSTM) Chapter 631

- **Volume 1** Preservation of Ships in Service - General
- **Volume 2** Preservation of Ships in Service - Surface Preparation and Painting
- **Volume 3** Preservation of Ships in Service - Surface Ship/Submarine Applications

**Repair Activities:** Underwater hull cleaning is accomplished periodically to:

- Maintain effective leaching rate of anti-fouling coating
- Improve fuel economy through reduction of hull friction resistance
- Restore sonar system performance by reducing self noise
- Prepare damaged or abraded surfaces for application of underwater curing compounds

Specific instructions on underwater hull cleaning are provided in NSTM Chapter 081, Waterborne Underwater Hull Cleaning of Navy Ships.

**Repair Activities:** The [Standard Specification for Ship Repair and Alteration Committee \(SSRAC\)](#) is responsible for providing technically and contractually sound standards for the Navy's ship repair and alteration community. The NAVSEA Standard Item applicable to surface ship preservation is Standard Item 009-32, "Cleaning and Painting Requirements." It contains cleanliness, surface preparation, and coating application requirements, along with complete system application instructions for each product (number of coats, coating thickness per coat, etc.) approved for aluminum underwater hull preservation.

All current NAVSEA Standard Items may be found [here](#).

**New Construction Ships:** New construction ships' underwater hulls are painted in accordance with the Ship Specification for that class of ship.

## NAVSEA Coating Area (Underwater Hull) Point of Contact:

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