Viability Study of 1K Oxsol (PCBTF) Free MIL-PRF-24635F Type V Comp 1 Coatings in OE Shipyards

MegaRust

June 2026

Background

- New environmental restrictions prevent some paint facilities from spraying coatings containing oxsol.
  - Some manufacturers changed single component (1k) coating formulations to omit oxsol.
- The benefits of 1k topcoats include:
  - Minimizes onset coating failures such as cracking and flexibility issues due to mixing errors that can occur with two component (2k) systems.
  - Reduced waste and disposal costs since 1k systems can be resealed and reused.
- Concerns about the corrosion protection of thinner oxsol-free 1k topcoats need to be investigated.

Scope of Work

- Identify gaps in knowledge of Navy 1k oxsol-free polysiloxane topside coatings meeting MIL-PRF-24635F Type V, Comp. 1 requirements and traditional 2k polysiloxane coating systems.

- Compare 1k and 2k polysiloxane systems production rates, reduction in material waste, and coating performance focused on corrosion protection, adhesion, flexibility and UV resistance.

Project Goals and Objectives:

- Assess overall system coating performance.
- Determine coating failure rates and quantify impact on rework.
- Benchmark overall production benefits (mixing/application).
- Track waste stream benefits where possible.
- Identify/share best practices among shipyard coating experts.

Tasks

- Task 1: Identify testing requirements, environmental monitoring metrics, and demonstration goals
  - Work with stakeholders/Navy technical advisors to identify requirements and tests
  - In-process
- Task 2: 1k vs. 2k evaluation - lab testing and environmental impact study
  - Execute laboratory testing on coating performance
  - Evaluate environmental impacts of coating material waste
  - Planned July – September 2026
- Task 3: Shipyard Demonstration
  - Partner yard demo(s) to gather production (paint and QC) feedback
  - Monitor production rates, waste, and coating performance
  - Planned September – December 2026
- Task 4: Final Report
  - Compile data, information, and results into final report (February 2027)

Task 1: Identify testing requirements, environmental monitoring metrics, and demonstration goals (in-process)

- Considering evaluation of the following for lab/demo tests:
  - 2 coats vs. Higher film build of 1 coat
  - Feasibility of touch-up work and overcoating of aged topcoats
  - Structural complexity and coating flexibility

Path Forward

- Identify outstanding technical and production concerns
  - Determine performance or production knowledge gaps based on existing data; clarify requirements and testing needed
- Finalize Test Plan for lab studies (coating performance)
- Draft plan for production assessment (environmental/waste, productivity)
- Begin discussions for yard demonstration

NSRP
NATIONAL SHIPBUILDING RESEARCH PROGRAM™
Taking Shipbuilding and Repair to the Next Level