

Department of the Navy SBIR/STTR Transition Program

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NAVAIR 2020-984

Topic # N162-129

Optimized Galvanic Corrosion Control of Repair Bushings and Fasteners Utilizing Advanced Performance Organic Coatings

Corrdesa

WHO

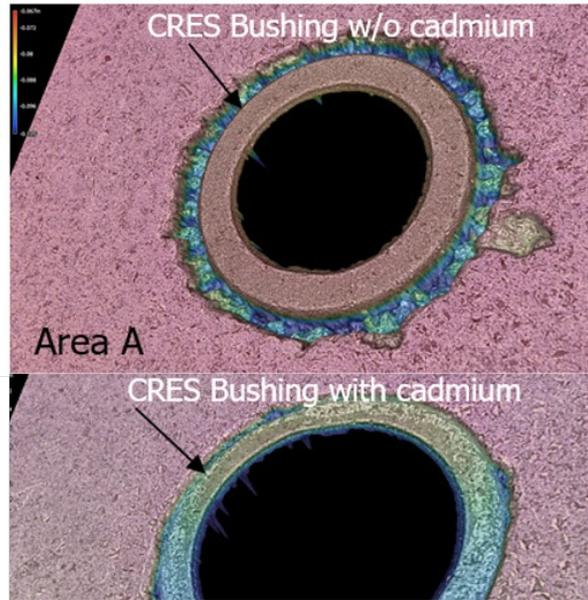
SYSCOM: NAVAIR

Sponsoring Program: Fleet Readiness Centers

Transition Target: Applicable to all Type/Model/Series of Aircraft (T/M/S A/C)

TPOC:
(904)542-4516

Other transition opportunities:
US Army helicopters
US Air Force T/M/S A/C



Place holder could replace with own corrosion photo

WHAT

Operational Need and Improvement:

NAVAIR wishes to eliminate the use of toxic cadmium on bushings used in repair. The proposal is to leverage NAVAIR reactive pigment coating technology however, the current development of these paint primer systems is inhibited by a lack of understanding on how the system behaves and protects coated aircraft components.

Develop innovative computational models and analysis tools that can support and accelerate the maturation of the reactive pigment coatings, to predict their interaction with metallic and non-metallic surfaces and quantify their performance in the laboratory and in naval operating environments.

Specifications Required:

Given the capability to customize the manufacturing process of metal filled primers, a model-based analysis/optimization tool is required that can adjust numerous parameters in order to optimize coating system performance. An accurate electrochemical modeling capability that explicitly accounts for the chemistry and structure of metal-filled primers. This would make it possible to predict the behavior of the primer in a primer/topcoat system as a function of resin system chemistry, solvents, additives, metal particle alloy, particle size and shape, surface chemistry, and loading.

Technology Developed:

Leveraging our unique simulation capability, Corrdesa will develop an easily applied Reactive Pigmented Coating (RPC) formulation specifically optimized to control galvanic corrosion of installed bushing repairs of aerospace structural materials as an alternative to toxic cadmium electroplating.

Warfighter Value:

- Reduce labor hours
- Reduce turn-around time (TAT)
- Improve Operational Readiness
- Eliminate environmental hazard of cadmium

WHEN

Contract Number: N68335-19-C-0524

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Electrochemical data acquisition from existing RPC formulations	Low	Valid boundary conditions for electrochemical modeling	7	August 2020
Optimization and ranking of best performing RPC formulations	Low	Downselection of top performing RPC systems	7	March 2021
Corrosion exposure test & post analysis of optimized RPC formulations	Med	Correlation between physical finding and model prediction	7	June 2021
Modeling and Aircraft Dem/Val using best performing RPC	Med	comparable performance to current standard	8	August 2021
Process Specification & Instructions	Low	finalized process specs & instructions	9	January 2022

HOW

Projected Business Model:

Corrdesa will license the optimized formulation to NCP Coatings and AV-Dec for manufacturing, commercialization and application initially on F/A-18, T-6, T-44, T-45, and F/A-18. Corrdesa will continue to provide support and further developments to the technology.

Company Objectives:

Connecting with other agency maintenance facilities as well as OEMs that can implement the technology into new platforms.

Potential Commercial Applications:

The coating can be implemented into many other fixture systems in platforms built by Lockheed, Boeing and Bell.

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