

WHO

SYSCOM: NAVAIR

Sponsoring Program: Naval Air Warfare Center Aircraft Division

Transition Target: Fleet Readiness Center (FRC) East

TPOC: (301) 342-7496

Other Transition Opportunities: DoD and Commercial Rotor Craft

Notes: This material is widely applicable to repair of honeycomb sandwich structures that are an integral part of air worthy composite structures such as the Advanced Naval Vertical Lift Platforms shown. Materials Sciences LLC (MSC) has decades of experience in composite technologies as well as in the transition of critical components to full scale production and commercialization into industrial applications.



U.S. Navy, <https://www.navy.mil/Resources/Photo-Gallery/igphoto/2003487609/>

WHAT

Operational Need and Improvement: A new lightweight, streamlined composite honeycomb repair material and process using a novel lightweight, structural filler formulation is sought to reduce the time required for honeycomb repairs. The proposed material could take advantage of various matrix chemistries and fillers. The repair material would be expected to meet threshold requirements, threshold mechanical properties, and target requirements.

Specifications Required: The material must cure within 24 hours at room temperature without exceeding 200F exothermic temperature. It must be compatible with Aluminum, Nomex, and Polyurethane foam cores, have a maximum density of 0.8 grams per cubic centimeter, and have a shelf life of 12 months at room temperature. It must also have a compressive strength of 8,000 pounds per sq. in and lap shear of 700 pounds per sq. in at room temperature and retain 50 percent of the compressive strength at 180F.

Technology Developed: MSC has worked to develop a low density, fast-curing honeycomb filler material that facilitates the execution of in-situ repairs quickly and efficiently without the need for special environmental or post-curing requirements. The development of a fast-curing filled resin system that can be sanded and faired after an abbreviated wait-time has the potential to significantly stream-line current in-situ honeycomb repair methods, ultimately returning a cost-savings to the Navy while also positively impacting the OPTEMPO of the associated platforms. MSC has met all Navy mechanical requirements, while delivering a 1 hour time to sand.

Warfighter Value: MSC's repair material enables an 7 hour time saving between material application and preparation for the new composite skin. Operationally, this means depot and I-level repairs can be completed in 20 percent of the time it takes to complete composite repairs currently. Our warfighters can now receive their equipment back 80% faster. Operational complexity of combat repairs also known as battle damage repairs is also significantly reduced by the material's ability to cure at low temperatures without any auxiliary equipment, so repairs can be completed and get warfighters off the ground to safety.

WHEN

Contract Number: N68335-23-C-0523

Ending on: Aug 04, 2025

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Demonstrate repair feasibility	Low	Successfully repair sandwich composite at maximum allowable diameter with formulated material	4	2nd QTR FY23
Optimize Material Formulation	Low	Meet all Navy targets	4	3rd QTR FY24
Validate Repair	Low	Analyze repaired composite panels for mechanical integrity	5	1st QTR FY25
Navy validation	Medium	Supply material to NAVAIR or FRC East for government evaluation	6	2nd QTR FY25

HOW

Projected Business Model: MSC's sister company, Seeman Composites, produces and markets syntactic foams in large quantities. MSC has already produced materials at the pilot scale and intends to reach full scale production at the end of Phase II program. It is our intension to produce the material in house and release to the market either directly or through the use of distributors. If demand rapidly out-paces our production capabilities, we are open to licensing the product.

Company Objectives: MSC's objective is to support the warfighter by producing the material at full scale and taking it into the commercial market space to increase it's economic viability. Our team is currently projecting a 30% reduction in cost over the legacy system which can be realized with wide adoption of the system by industry.

Potential Commercial Applications: Dual use commercialization of the material will concentrate on systems developed for the maritime, transportation, green energy, high performance sports such as Formula 1, and construction industries.