

Topic: N171-042

Materials Sciences LLC

Improved Skirt System for Air Cushion Vehicles

The Improved Skirt System for Air Cushion Vehicles (ACV) uses a new elastomer coating technique to create a strong, abrasion resistant textile to withstand extreme physical requirements. Materials Sciences LLC (MSC) is an engineering and manufacturing company focused on applying knowledge of material mechanics to create unique solutions. The skirt system for the Ship-to-Shore Connector (SSC) sees perhaps the most extreme punishment of any coated fabric, resulting in high replacement costs and down-time. MSC's approach uses an alternative coating method which enables high-performance textile designs that are incompatible with conventional techniques. The product has shown superior performance to the existing product. MSC is currently tooling up production capabilities to support the SSC integrator as a new material supplier for the skirt fabricator.

Technology Category Alignment:

None

None

None

Contact:

Michael Orlet

orlet@materials-sciences.com

(215) 542-8400

<http://www.materials-sciences.com/>

SYSCOM: NAVSEA

Contract: N68335-19-C-0185

 Corporate Brochure: https://navystp.com/vtm/open_file?type=brochure&id=N68335-19-C-0185

Department of the Navy SBIR/STTR Transition Program

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NAVSEA ##19-508

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Improved Skirt System for Air Cushion Vehicles
Materials Sciences Corporation

WHO

SYSCOM: NAVSEA

Sponsoring Program: Ship to Shore Connector (SSC) and Landing Craft Air Cushion (LCAC)

Transition Target: Supply material to SSC integrator for skirt components

TPOC:
(850)234-4411

Other transition opportunities: Fuel Bladders, Inflatable systems



Photo, courtesy U.S. Navy,
<https://www.navy.mil/management/photodb/photos/190223-N-KG461-1301.JPG>

WHAT

Operational Need and Improvement: Replacement of Skirt System components for Navy Air Cushion Vehicles (ACV) drives maintenance cost and asset availability. The lower portions of the skirt -- called "fingers" -- see perhaps the most extreme punishment of any coated fabric, experiencing abrasion, tearing, and flagellation.

Specifications Required: Fingers made from current rubber coated fabric survive less than half of the 300 hours of operation that the Navy would like. The replacement material must exceed operational life and reduce total ownership cost by 25%.

Technology Developed: MSC's new elastomer coating technique allows for unique textile reinforcement architecture that could not be achieved with current coating fabrication methods. The resulting material has shown > 3X improvement in laboratory fatigue testing as well as higher abrasion resistance and strength.

Warfighter Value: Skirt replacement is labor intensive, costly, and removes vehicles from service. This means less time and resources maintaining the vehicle and more time preparing for duty.

WHEN

Contract Number: N68335-19-C-0185 **Ending on:** March 21, 2020

| Milestone | Risk Level | Measure of Success | Ending TRL | Date |
|--|------------|------------------------------------|------------|---------------|
| Target Design Completed | Low | Physical Requirements Met | 5 | August 2019 |
| Full Scale Manufacturing Demonstration | Low | Continuous Coating Line Functional | 5 | December 2019 |
| Prototype Components Fabricated | Low | Field-ready prototypes | 6 | May 2020 |
| Successful On-Board Testing | Med | Prototypes Survive >300 hrs | 7 | November 2020 |

HOW

Projected Business Model: MSC aims to become the main supplier of material for the SSC and LCAC skirt systems. Currently skirt components are fabricated by a subcontractor to the integrator, business models include supplying fabricator with material or providing complete skirt components to the Navy.

Company Objectives: By 2022, produce an entire ship set worth of material, Beyond 2022, supply material as needed.

Potential Commercial Applications: Fuel and water bladders, containment for critical applications, inflatable structures for marine and land products.