

NAVY Transition Assistance Program

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NEED & CUSTOMER REQUIREMENT

Need: Fiber glass reinforced polymers (FRP) are used in building the structural components for ships and aircraft. As a structural part, these materials are very rigid and strong. However, they may not perform well in cavitating environments and can be eroded by sand or rain fairly quickly. These deficiencies could be serious for the propulsion and lift fans as well as under water propulsors.

Value to the Warfighter: Hontek coatings offer high sand and rain erosion protection. Hontek-coated rotor blades have demonstrated potential for unlimited blade life when properly maintained with Hontek repair kits. During one-year deployment, a total of 50 Black Hawks with Hontek-coated blades flew 31,000 hours without any main rotor blade replacements in Iraq and Afghanistan. Similar deployment without Hontek coatings resulted in 26% to 30% main rotor blade replacements. The coatings also demonstrated cavitation erosion resistance of up to 450 times better than competitive materials. Fast repair and long durability can drastically improve warfighting efficiency and save DOD tremendous operating cost. These benefits can be transferred to Navy platforms.

Operational Gap: Current erosion and cavitation protection is not adequate. Current replacement and repair of damaged propulsion/lift fan and propulsor blades are both cost and time intensive.

Customer Specifications: Coating and moldable resin must take into account lift fan blade design and future repair conditions. Must have superior rain/rain-sand erosion and cavitation resistance.

Technology Description: Hontek erosion protection technologies are based on polyurethane elastomers. They are supplied as sprayable coatings or moldable resins. Hontek erosion protection technologies are field repairable: the blades can be repaired without removal. Hontek has also designed into their erosion protection products an Early Erosion Indicator, for easy visual cues of erosion damage level.

TECHNOLOGY DEVELOPMENT MILESTONES (SBIR/STTR)

Milestone	TRL	Risk	Measure of Success	TRL Date
In water propulsors: Conduct cavitation erosion tests	4	High	Obtain cavitation erosion resistance close to nickel-aluminum-bronze alloy	12/2009
In-water propulsors: Develop anti-barnacle coating with high cavitation erosion resistance.	4	Moderate	Demonstrate anti-barnacle growth in marine environment.	10/2010
In-Air lift fan blades: Spray coatings on used lift fan blades and return for field trial	7	Moderate	Demonstrate the long-term effectiveness of the coating performance in real operational environment.	10/2010
In-Air propulsion propellers: Fabricate molded boots for field trial	7	Moderate	Demonstrate the long-term effectiveness of the coating performance in real operational environment.	10/2010

Open contract: N00014-09-C-0124 ending 03/12/2010

N07-097 - Hontek Corporation

Erosion Resistance Coatings for Composite Propulsor/Fan Blades

SPONSORSHIP of original SBIR/STTR Topic

SYSCOM: ONR - SBIR

Transition Target: Air-cushion vehicles such as LCAC and SSC. Helicopters.

Original Sponsoring Program: Office of Naval Research

TPOC Phone Number: (703)696-4305



TECHNOLOGY TRANSITION OPPORTUNITIES (PHASE III)

Other Potential Applications:

Helicopter rotor blades, propeller blades. Any parts subject to cavitation, rain/sand erosion. Possible applications include underwater turbine blades, boat propulsor blades, fan blades, high speed water vehicles.

Business Model:

Hontek Coatings will be sprayed at Hontek Certified Facilities to ensure proper application and best performance results. Hontek will work with platforms, program offices and industry on licensing and certifications. Repairs can be done on field level.

Objective:

Hontek is looking for OEMs, Program Offices and other transition opportunities/program dollars for qualification on various platforms and/or equipment.