

Topic: N151-022

Atmospheric Plasma Solutions

Cost Saving, Chemical & Abrasive Free Coating Removal and Surface Preparation Process

Atmospheric Plasma Coating Removal (APCR) is a new, environmentally responsible, method for coating removal. APCR is found to be a safe and effective alternative to media blasting. Requiring only compressed air and electricity to operate, a low temperature air plasma beam is created which enables rapid coating removal without the use of any media, virtually eliminating the need for containment. The APCR process converts the coating into a dry residue which can be vacuumed away. Single or multiple plasma beams may be configured for handheld or robotic use to prepare a variety of substrates. The APCR technology is suitable for use on a wide range of coatings found in the US Navy and other DoD service branches in addition to a wide variety of commercial applications.

Technology Category Alignment:

Materials & Manufacturing Processes

Contact:

Peter Yancey

pyancey@apsplasma.com

(919) 341-8325

<https://apsplasma.com/>

SYSCOM: NAVAIR

Contract: N68335-17-C-0160

 Corporate Brochure: https://navystp.com/vtm/open_file?type=brochure&id=N68335-17-C-0160

Department of the Navy SBIR/STTR Transition Program

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NAVAIR 2017-736

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WHO

SYSCOM: NAVAIR

Sponsoring Program: PMA-251

Transition Target: Expeditionary Airfields (EAF)

TPOC:
(732)323-2093

Other transition opportunities:
NAVAIR 6.0, NAVSEA 21,
NAVSEA 04, PEO Ships, PEO Subs

Notes: Pictured is a portable PlasmaBlast™ Atmospheric Plasma Coating Removal (APCR) system being used to remove paint around fasteners. The system is small and lightweight, enabling its use inside tanks and other confined spaces. This technology addresses corrosion, coating removal and surface preparation issues for almost any naval platform or facility.



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WHAT

Operational Need and Improvement: There is an immediate and growing need for a more environmentally friendly, operator-safe, cost-effective paint and coating removal solution for use on naval platforms and at naval facilities. This technology significantly reduces risks and hazards associated with media-based mechanical and chemical coating removal processes. The plasma coating removal technology has particular effectiveness where abrasive blasting is not easily deployed, specified or permitted. The plasma technology can be used to reduce costs for Non-Destructive Inspections (NDI), weld prep, and spot coating removal.

Specifications Required: APCR has been demonstrated to be an effective alternative to media and wet abrasive blasting on a wide range of painted/coated surfaces, including steel and aluminum. The lightweight and intuitive system can be setup quickly and is easily operated by one user. The PlasmaBlast APCR system weighs less than 30 pounds and only requires compressed air and standard 110/240 volt power, making it a truly portable and easily-deployed system. The system can be used in confined or open spaces because media, water, or chemicals are eliminated.

Technology Developed: The PlasmaBlast system uses electricity and compressed air to produce an air plasma beam. The power supply provides the electrical power to excite the air into the plasma state and the plasma pen forms and shapes the plasma beam. The APCR process converts a significant portion of the removed organic coating into water vapor and carbon dioxide, leaving behind less solid mass than was present in the original coating. The remaining solids are a dry dust which can be safely collected with a suitable vacuum filtration system. The plasma beam is scanned across a coated surface (manually or robotically) to remove the coating layer by layer, allowing for full or selective removal, in addition to cleaning and surface preparation.

Warfighter Value: This novel technology advances the Navy's goal of improving shipboard maintenance to increase the operational lifetime of ships and aircraft. The implementation of the APCR technology will improve shipyard efficiency, lower maintenance costs, lower ship construction costs and shorten ship construction delivery timelines.

WHEN

Contract Number: N68335-17-C-0160 **Ending on:** May 24, 2019

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Completed Navy Phase 2 SBIR	Low	Demonstrated effective removal to bare metal of standard Navy coating used on DH-36 steel	5	August 2012
System installed in multiple DoD research laboratories	Low	Engineers produced independent baseline data on multiple combinations of coatings and substrates	6	May 2015
Field tested systems in multiple military shipyards	Low	Removed a variety of coatings to bare metal and achieved up to a 94% labor savings	7	January 2017
Redesigned for ruggedization, portability and ergonomics	Low	Reduced weight by 50% and the volume by 66%. System is now easily deployed by one person	7	June 2017

HOW

Projected Business Model: The PlasmaBlast APCR systems will be available during the 3rd quarter of 2017 for onsite testing and evaluation by Naval labs or shipyards. APS is working with independent laboratories to validate that the APCR removal process does no damage to the underlying substrates. The system is in the final stages of design and engineering with the operationally ready units available for purchase by DoD in March 2018 in volume quantities.

Company Objectives: To introduce the world's first environmentally responsible, atmospheric plasma coating removal system based upon a patented PlasmaBlast APCR technology that quickly and safely removes protective coatings. The current product is ideal for removing coatings and sealants from intricate fittings and parts, for NDI applications, and significantly reducing or eliminating the need for additional surface preparation prior to recoating. Technology development programs are currently underway to achieve higher production rates and to enable technology integration into readily available coating removal platforms, including robotics. These advancements are intended to create cost-and time-effective solutions for large-scale projects.

Potential Commercial Applications: The APCR technology represents the next generation of coating removal solutions for coatings found in marine, aviation, and most commercial industries where paint and protective coatings are used. The company plans to introduce this flagship "Precision Blasting" system to shipyards and other industrial market segments beginning in 2018. Other commercial applications are envisioned in the transportation, utility, and construction industries.

Contact: Peter Yancey, Chief Technical Officer
pyancey@apsplasma.com 919-341-8325