Topic: N181-001

JNI Armor

Extended Service Life of Transparent Armor
Currently, ballistic glass in our tactical fleet has delamination within the sight line and in storage. Our technology can improve ballistic glass from delamination. Using our processes and materials, transparent armor can last 5 years or better! Using our life prediction model, we predict product lifespan according to an accelerated aging process. JNI Armor technology improves the warfighter safety and return on investment by reducing logistic costs while the vehicles remain in the fight longer! The targeted applications are tactical vehicles: HMMWV, MTVR and MRAP, additionally it can be installed on rotor crafts and marine vessels. JNI Armor is an engineering company that specializes in developing transparent armor solutions for every vehicle application. We currently use this technology to sell viewports on ballistic police shields.

Technology Category Alignment:

Ground and Sea Platforms
Materials & Manufacturing Processes
Air Platforms

Contact:
David Jungk
Djungk@jniarmor.com
(714) 951-5118
https://jniarmor.com/
SYSCOM: MARCOR
Contract: M67854-20-C-6505
Corporate Brochure: https://navystp.com/vtm/open_file?type=brochure&id=M67854-20-C-6505

Department of the Navy SBIR/STTR Transition Program

DISTRIBUTION STATEMENT A. Approved for public release. Distribution is unlimited.

MCSC-PRR-3584

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Extended Service Life of Transparent Armor

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WHO

SYSCOM: MARCOR

Sponsoring Program: PEO Land Systems

Transition Target: Transparent Armor

TPOC:
sbir.admin@usmc.mil

Other transition opportunities: JNI advance technology methods allows for agile and flexible installments to fit across the tactical vehicle spectrum: Tactical and commercial vehicles, boats/ships, rotorcraft, fixed wing and hardened buildings.



Image courtesy of JNI Armor 2020.

Notes: Our Phase I technologies have already resulted in multiple Phase III contracts. One of the Phase III contracts currently in production is the commercial development of viewports for ballistic shields. BAE Systems also awarded JNI Armor a Phase III development contract to transition the viewport technology into vision blocks for the Amphibious Assault Vehicle (AAV) program. These windows are currently going through test, and JNI Armor is currently responding to RFQ's from the DLA. The BAE Systems Phase III development also included fabrication of HMMWV windshields for accelerated aging tests, to further advance durability. The HMMWV windshields will be ready for procurement late 2020.

WHAT

Operational Need and Improvement: US Marine Corp (USMC) and other services are seeking to improve technology to advance their transparent armor durability, utility, and increase life expectancy with a reduction of line-of-sight delamination issues. Delamination of armor windows have become an issue across all services from vehicles, ships and even aircraft. The current transparent armor products have a history of delamination in the viewing area, and even while in storage. As a result, these delamination issues are having a direct impact of the readiness of our warfighter by causing delays in deployment, jeopardizing safety, decrease in visibility, and while increasing cost with multiple spare parts required, longer equipment out of service issues, maintenance issues, and logistic issues.

Specifications Required: The USMC needs transparent armor materials to last at least 5 years as well as methods to procure technologies.

Technology Developed: JNI Armor technology reduces delamination in transparent armor through a suite of technologies including; lower residual stress laminates, neutral cure potting systems, improved edge seals, and improved adhesion. Additionally, JNI Armor's life prediction model translates accelerated aging tests to measure actual lifetime, resulting in better government value purchase of durable transparent armor.

Warfighter Value: This technology will save lives by improving visibility on the windows.This includes USMC, Army and other DoD lives that are currently sitting behind transparent armor with delamination within the sight line. More armored vehicles will be able to remain in service longer because the transparent armor will not have to be replaced as often. This technology will also be able to reduce parts getting delaminated in storage.

WHEN

Contract Number: M67854-20-C-6505 **Ending on:** February 28, 2022

Milestone	Risk Level	Measure of Success	Ending TRL	Date
TA Durable Material Evaluation	Low	Demonstration of improvements	TRL 3	4th QTR FY20
Laminate Residual Stress Reduction	Low	Successful reduction in laminate residual stress. Demonstration of novel measurement techniques	TRL 4	4th QTR FY20
Residual Stress Model	Med	Validation of residual stress prediction from measure laminates	TRL 4	4th QTR FY20
Transition to Vehicles	Low	Transition of technologies to at least one program of record (After record HMMWV, MTVR, etc)	TRL 8	2nd QTR FY21
Life Prediction Model Development	Med	Demonstration of life prediction model from measured results	TRL 7	2nd QTR FY21
Transition to Vehicles	Low	Transition of final technologies to production programs (including JLTV)	TRL 8	2nd QTR FY22

HOW

Projected Business Model: JNI Armor has developed strategic partnerships with BAE Systems, AM General and Navistar Defense. These OEMs are mutually interested in developing better transparent armor technologies. JNI Armor also has strategic partnerships with key manufacturing, resulting in 5 lamination lines, 8 autoclaves and capability to manufacture over 500 laminates a day, and 120,000 components per year. Manufacturing can be doubled with incorporation of a 2nd shift.

Company Objectives: JNI Armor is focused on developing better transparent armor technologies for the young warfighters that defend our freedoms. This includes supporting government procurement methods. We want to get to the Program Executive Offices for tactical vehicles to work with them to develop a procurement strategy that they can buy under a 'Best Value' approach. This would allow them to buy better value technologies may cost more, but will last longer versus lowest priced systems that are currently failing quickly.

Potential Commercial Applications: JNI Armor has already developed commercial applications into viewports for ballistic shields (based on Phase I technologies). JNI Armor anticipates transitioning technologies to tactical vehicles (HMMWV, FMTV, MTVR, M-ATV and JLTV), boats (Mark IV, MSV-L, MSV-M, and MSV-H), ships, rotorcraft, and buildings. This technology is also anticipated to be a lightweight transparent armor solution for State Department vehicles such as the Suburban.

Contact: David Jungk, Principal Investigator
Djungk@jniarmor.com 714-951-5118