

WHO

SYSCOM: NAVAIR
Sponsoring Program: NAVAIR-Naval Air Systems
Transition Target: Hypersonic air vehicle
TPOC: (301) 342-3728

Other Transition Opportunities: Navy applications could include CPS and HALO. Could be applied to any air vehicles which must fly at high supersonic to hypersonic speeds. There are diverse applications such as components exposed to high temperatures, aircraft engines, airliner fuselages, and confined electronics.

Notes: CPS-Conventional Prompt Strike boost glide hypersonic missile
 HALO-Hypersonic Air Launched Offensive Anti-Surface missile

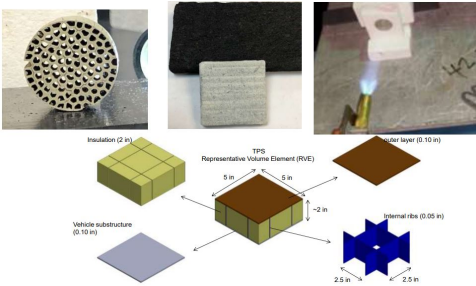


Image courtesy of Advanced Ceramic Manufacturing, LLC

WHAT

Operational Need and Improvement: It is known that size and weight of existing systems might be improved with a lighter weight ultralow thermal conductivity insulating system. System performance would be significantly improved given an order of magnitude reduced thermal transmission profile. Any weights and balances for an existing system would be altered with reduced weight.

Specifications Required:

Technology Developed: Lightweight silicon carbide (SiC) thermal protection system capable of order of magnitude improvement to thermal conductivity, and mechanical strengths to allow structural performance beyond current state of the art. This has been coupled with a predictive model that guided development efforts to target specific performance for thermal and mechanical elements.

Warfighter Value: Size, weight and range of flight system could be affected, thermal loads to internal components (electronics and controls) and external structure translation of heating would be reduced.

WHEN

Contract Number: N68936-23-C-0008 **Ending on:** May 18, 2025

| Milestone | Risk Level | Measure of Success | Ending TRL | Date |
|--|------------|---|------------|--------------|
| Maturation of SiC manufacturing processing | Low | A robust process identified along with influences on performance | 6 | 3rd QTR FY25 |
| High temperature verification of TPS performance | Medium | Performance in a relevant environment determined and used to inform predictive model | 6 | 3rd QTR FY25 |
| Development of predictive thermo-structural TPS Foam model | Medium | Tested performance used to tailor predictive model to refine architecture for optimal performance | 7 | 3rd QTR FY25 |
| High temperature verification of TPS performance | Medium | In a relevant environment determine performance of optimal architecture | 6 | 3rd QTR FY25 |

HOW

Projected Business Model: Development of thermal protection system material, characterization and performance evaluation in relevant environments. Work with prime contractors to transition technology developed to applications such as hypersonic flight systems, and other systems where thermal protection, barriers or other thermal management strategies would benefit.

Company Objectives: This technology builds on knowledge Advanced Ceramics Manufacturing (ACM) has developed and continues to evolve for high temperature materials. It is part of a range of technologies ACM has to address severe environments for systems.

Potential Commercial Applications: Thermal protection system for sensitive electronics, thermal management for systems with external heat loads, aircraft engines, would allow passive rather than an active system for certain thermal loads where a source is thermally radiating, and key components need protection to allow continued performance (electronics, structures, aero systems).