

Topic: N142-088

ATA Engineering, Inc.

High Efficiency Insulating Barrier for Expeditionary Shelters

ATA Engineering has developed a lightweight and compact insulating barrier for expeditionary shelters. Based on a tensioned cellular fabric design concept, the barrier is intended to reduce electrical power consumption and packed size/weight of operational equipment by improving insulation qualities of softwall shelters. ATA is an engineering services company that provides innovative simulation and testing solutions to our customers in the defense, aerospace, and other mechanical design industries. The company leveraged this expertise in developing a barrier design for the Marine Corps' Expeditionary Shelter System (ESS) (Medium), sold by HDT Global as the Base-X Model 305. ATA's insulating barrier replaces both the existing interior liner and radiant barrier used in the ESS (Medium), greatly reducing the logistical footprint for the warfighter while improving insulative performance.

Technology Category Alignment:

Thermal Transport and Control

Mobility

Protection, Sustainment, and Warfighter Performance

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SYSCOM: MARCOR

Contract: M67854-16-C-6505

 Corporate Brochure: https://navystp.com/vtm/open_file?type=brochure&id=M67854-16-C-6505

Department of the Navy SBIR/STTR Transition Program

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WHO

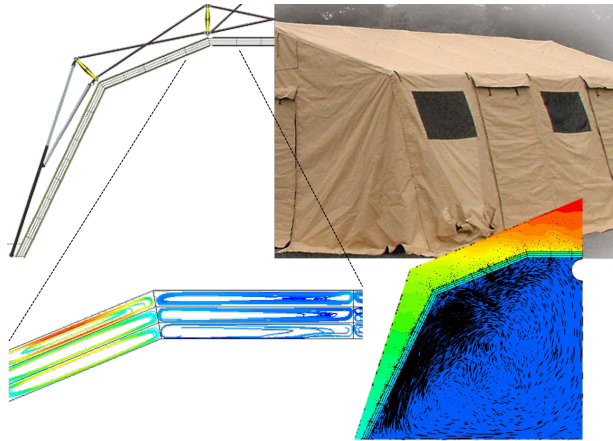
SYSCOM: MARCOR

Sponsoring Program: Combat Support Equipment

Transition Target: Expeditionary Shelter Systems (ESS)

TPOC:
sbir.admin@usmc.mil

Other transition opportunities: Expeditionary shelter systems for other DoD components, temporary shelters for disaster recovery



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WHAT

Operational Need and Improvement: The US Marine Corps seeks to

1. Reduce the logistical footprint associated with expeditionary shelter systems
2. Improve softwall shelter insulation qualities
3. Reduce the energy required for maintaining internal temperatures

Specifications Required:

- Improved insulation capabilities of softwall shelter insulating barrier systems (R-value no less than 4 with an objective of 8).
- Decreased packed cube/size and weight by a minimum of 25% (thickness no more than 0.25 in with an objective of at least 0.125 in, when packed / weight no more than 12 ounces per square yard with an objective of 8 ounces per square yard).
- Man-portable by 2-4 personnel, durable, and capable of being deployed and stored for up to 15 years without degradation or damage.
- Materials meet the following standards: AATCC 30 Antifungal Activity, CPAI-84 Flame-Resistant Materials Used in Camping Tentage, ASTM D6413 Test Method for Flame Resistance of Textiles.
- Function in all climates and environments encountered by USMC forces (pass applicable tests outlined in MIL-STD 810F/G with no performance degradation in between 125° F and -40° F).

Technology Developed: ATA Engineering has developed a lightweight and compact insulating barrier for expeditionary shelters based on a tensioned cellular fabric design concept. Using entrapped air as the primary insulator, it incorporates low-emissivity coatings to maximize system R-value. The barrier replaces both the existing interior liner and radiant barrier used in the ESS/Medium, greatly reducing the logistical footprint while improving insulative performance.

Warfighter Value: Because the insulating barrier integrates with a widely fielded shelter system (ESS/Medium, HDT Base-X® 305) and is extensible to several other shelter models, it promises to provide immediate and realizable reduction in the HVAC requirement (and associated power, fuel, and packed physical space) associated with expeditionary missions.

WHEN

Contract Number: M67854-16-C-6505 **Ending on:** November 30, 2018

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Alpha prototype fabrication	Med	Construction of full-size prototype barrier. Demonstration of manufacturability.	5	4th QTR FY17
Initial test and evaluation to document prototype R-value	Med	Cold and hot environment insulative performance measurement	6	1st QTR FY18
Beta prototype fabrication	Med	Delivery of multiple pre-production systems	6	3rd QTR FY18
Field testing of beta prototypes	Med	Demonstration of system robustness in representative environment by end users	7	4th QTR FY18

HOW

Projected Business Model: ATA is collaborating with HDT Global, manufacturer of the Base-X® family of expeditionary shelters, to bring the product to market. HDT will license the technologies embodied in the insulating barrier from ATA.

Company Objectives: To continue involvement in the engineering, analysis, and optimization of the insulating barrier design and development of derivative products for other shelter models and families.

Potential Commercial Applications: Camping tents, home insulation, temporary housing

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