Department of the Navy SBIR/STTR Transition Program

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MCSC-PRR-5528

Topic # N21A-T001
Innovative Method for Development of Hemp based Fabric
Technology Holding, LLC

WHO

SYSCOM: MCSC

Sponsoring Program: Marine Corps Systems Command

Transition Target: Marine Corps Combat Utility Uniform (MCCUU)

TPOC: sbir.admin@usmc.mil

Other Transition Opportunities: Army Combat Uniform (ACU), Navy Working Uniform (NWU), Operational Dress Uniform (ODU), Service dress uniforms for all the branches of the military, civilian law enforcement uniform, civilian athletic clothing.

https://www.marinecorpstimes.com/news/your-marine-corps/2023/06/02/marines-release-specs-for-high-tech-next-gen-combat-utility-uniform/

Notes: Hemp-based clothing is excellent for outdoor active wear due to high strength, UV-protective qualities, mold resistance and excellent moisture absorption and desorption. Although hemp has excellent properties, hemp fabrics and garments still face major challenges in the fabrication process and wearability. To achieve the overarching goal of high-performance hemp military uniform, the first and crucial step is to develop high-quality hemp yarns. The proposed project will develop an innovative hybrid spinning process to yield wearable grade fabric yarns.

WHAT

Operational Need and Improvement: The US garment industry predominantly revolves around cotton and cotton-blend fabrics, despite cotton's detrimental environmental impacts such as soil nutrient depletion and heavy water usage. Hemp emerges as a promising alternative due to its superior environmental sustainability, including nutrient retention and bioremediation capabilities. However, challenges persist in fabricating hemp garments due to reliance on cotton-centric manufacturing processes. This initiative signifies a pivotal step towards integrating sustainable materials into critical sectors like military apparel.

Specifications Required: Durability, lightweight, UV protection, mold resistance, efficient moisture management, improved wearability, and improved flame resistance.

Technology Developed: Technology Holding LLC has developed a hybrid wet spinning process, in collaboration with North Carolina State University, aimed at enhancing the quality of hemp yarns to produce lightweight, high-performance fabrics suitable for military uniforms.

Warfighter Value: Provides high-performance fabric for uniforms offering all the required specifications including strength, softness, wearability, and moisture management that ultimately reduce fatigue, preserves overall health, and therefore efficiency of military personnel.

WHEN

Contract Number: M67854-23-C-6513 **Ending on:** Aug 28, 2025

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Setup Production System	Low	Samples	4	4th QTR FY24
Caring Parameters Optimization	Medium	Test Data	5	1st QTR FY25
Spinning Parameters Optimization	Medium	Test Data	6	2nd QTR FY25
1.5 x 50 yard fabric equivalent to 10 uniforms	Medium	Finished stitch worthy fabric	7	4th QTR FY25

HOW

Projected Business Model: Transition either by spinning-off an entity which partners with a garment manufacturer or by technology licensing to commercial garment company.

Company Objectives: Our objective is to achieve technology transition to DoD agencies and to lead and open adjacent markets.

Potential Commercial Applications: Uniforms and garments for local, state, and federal law enforcement personnel, emergency services providers, healthcare professionals, commercial private entities requiring uniforms for personnel, athletic teams apparel, retail athletic apparel.

Contact: Bhavin Vadgama, Principal Engineer
bhavin@tekholding.com (678) 622-4624