

Topic: N143-128

Lynntech, Inc.

Advanced Textile Manufacturing Utilizing 3D Printing

Lynntech Inc is developing new polymeric materials that can be extruded to make filaments compatible with fused filament fabrication (FFF) techniques. The newly developed polymer formulations, textile design, and printing process will reduce the number of steps required to manufacture clothing items and simplify production of personalized garments. It will also allow production of clothing articles with mechanical strength and water vapor transport capabilities essential for military fabrics, and allow low volume manufacturing of garments in remote locations. Moreover, this technology will allow for design of garments from a 3D body scanner. Lynntech, a 2016 Tibbetts award winning small business, is looking for textile partners to integrate our 3D printing techniques and formulations into their customizable clothing article development.

Technology Category Alignment:

Protection, Sustainment, and Warfighter Performance

Individual Warfighter

Contact:

John Stocker

john.stocker@lynntech.com

(979) 764-2226

<https://lynntech.com/>

SYSCOM: NAVSUP

Contract: N00189-17-C-Z015

 Corporate Brochure: https://navystp.com/vtm/open_file?type=brochure&id=N00189-17-C-Z015

WHO

SYSCOM: NAVSUP

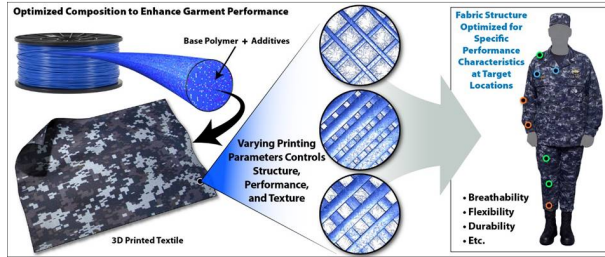
Sponsoring Program: Navy Clothing and Textile Research Facility (NCTRF)

Transition Target: Military Clothing sales via military exchanges and/or 3D-printed clothing and additive manufactured textiles and garments

TPOC:
(508)233-1340

Other transition opportunities:

Additive manufacturing of military uniforms for the Army, Air Force, or Marine Corps, as well as for the civilian textile sector.



Lynntech Inc 2018

WHAT

Operational Need and Improvement: The design and fabrication of a clothing item is a multi-step process that starts with fiber production leading to fabric manufacturing, sizing, designing and tailoring; all time consuming, invasive, and often inaccurate processes resulting in consumer dissatisfaction.

Specifications Required: 3D printed textiles that are flexible, comfortable, and durable that will be used for military uniform applications in order to quickly and efficiently obtain custom clothing articles. The 3D printed textile must resemble a military uniform in air permeability, water absorption, strength, launderability, and comfort.

Technology Developed: Lynntech has developed new polymeric materials that can be extruded to make filaments compatible with Fused Filament Fabrication techniques to produce highly customizable clothing articles of interest to the various branches of the military.

Warfighter Value: As a deposition technology, Lynntech's new polymeric material and 3D printing process provides a means for the development of new products in fabric design and personal clothing production. Compared to traditional textile manufacturing methods, which assemble 3D structures from 2D components, 3D Printing does not require to transition from 2D to 3D, thus conventional spreading, cutting, and sewing can be eliminated. In addition, 3D Printing permits the Navy to incorporate complex designs into textile products and offers the potential to create seamless clothing.

WHEN Contract Number: N00189-17-C-Z015 Ending on: September 30, 2019

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Demonstrate fabrication and printing of custom filament formulation	N/A	Improved flexibility/water absorption as compared to COTS nylon filament	3	September 2016
3D print a prototype clothing article	High	3D print a full-scale prototype clothing article	4	December 2018
Optimize 3D printed clothing articles	High	3D printed article with equal or better properties than NyCo fabric	5	March 2019
Produce and deliver 20 clothing items	Med	3D print quantity twenty of a clothing item	5	September 2019

HOW

Projected Business Model: Lynntech plans to transition this technology by either (i) licensing the technology to an additive manufacturing (AM)/textile company; or (ii) producing the filament at Lynntech and selling the rolls of filament to textile companies within the additive manufacturing field. The current business strategy is to either form a spinoff company to begin mass manufacture of the military and civilian clothing using AM or the IP would be licensed to one of the existing clothing manufacturers.

Company Objectives: Lynntech's objective for this project is to develop a formulation and process to be able to 3D print clothing articles with similar or improved properties to existing Navy uniforms with the added benefit of ease of manufacturing as well as custom form and fit. Lynntech Inc., a 2016 Tibbetts award winner, is a for-profit small business and believes that if the above objectives are properly met, sales and profit will follow.

Potential Commercial Applications: In addition to delivering clothing articles to the civilian apparel market, this technology has the capability to meet various other applications such as smart clothing (incorporating circuitry into the clothing), flame retardant apparel, and radar blocking/bullet proof uniforms. This can all be done through custom formulations that are developed in a quick and simple process with additive manufacturing.