



ADVANCED FUNCTIONAL
FABRICS OF AMERICA

Advancing Functional Fabrics Through Collaborations

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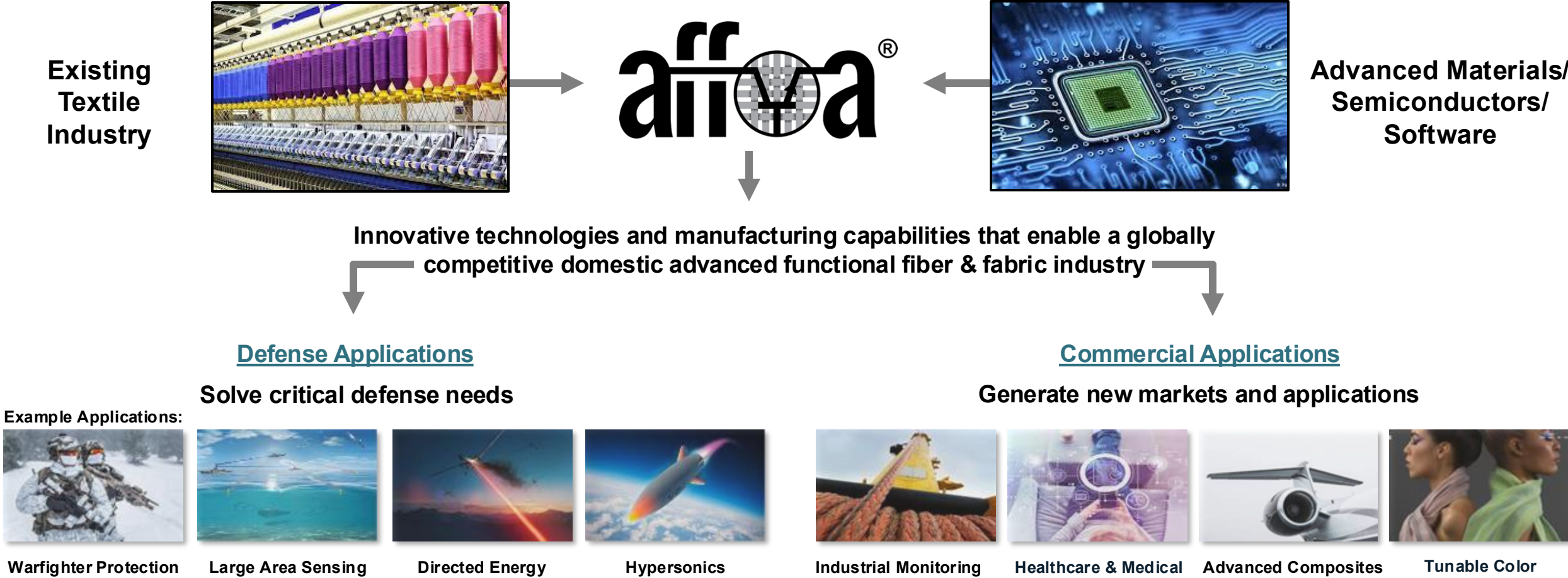
VP New Business Development & Partnerships

July 2025

Our Vision: Revolutionize America's Textile Industry



Mission: *Rekindle the domestic textiles industry by leading a nationwide enterprise for advanced fiber & fabric technology development and manufacturing, enabling revolutionary system capabilities for national security and commercial markets*





Key Roles



Build an Advanced Textile Manufacturing Ecosystem

Developing the domestic supply chain of the future to meet DoD and commercial needs with long-term strategic and rapid response capabilities

Develop & Transition Advanced Functional Fibers and Textiles

Transforming traditional fiber, yarns, and textiles into highly sophisticated, integrated, and networked devices and systems

Create Innovative Textile Workforce of the Future

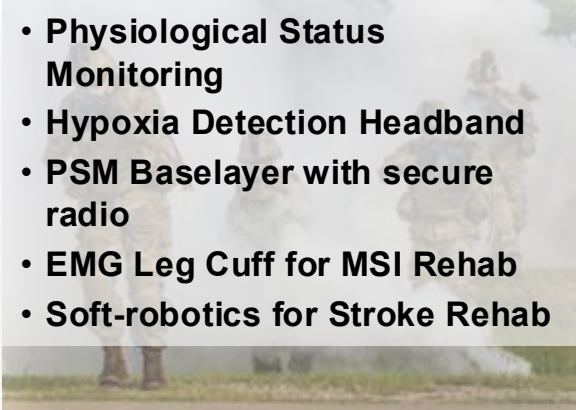
Building collaborative Education and Workforce Development programs to inspire, prepare, and grow the workforce pipeline for the advanced textiles industry

Technology Program Thrusts



Human Health & Performance

- Physiological Status Monitoring
- Hypoxia Detection Headband
- PSM Baselayer with secure radio
- EMG Leg Cuff for MSI Rehab
- Soft-robotics for Stroke Rehab



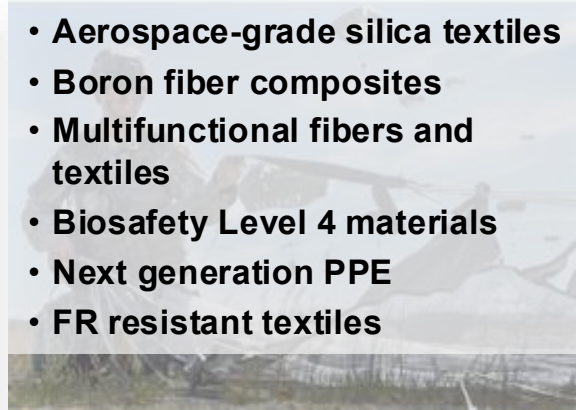
Environmental Protection

- Thermal regulation for arctic environments
- Advanced Insulation
- Chemical Sensing
- Load Management
- Moisture Management



Advanced Materials

- Aerospace-grade silica textiles
- Boron fiber composites
- Multifunctional fibers and textiles
- Biosafety Level 4 materials
- Next generation PPE
- FR resistant textiles



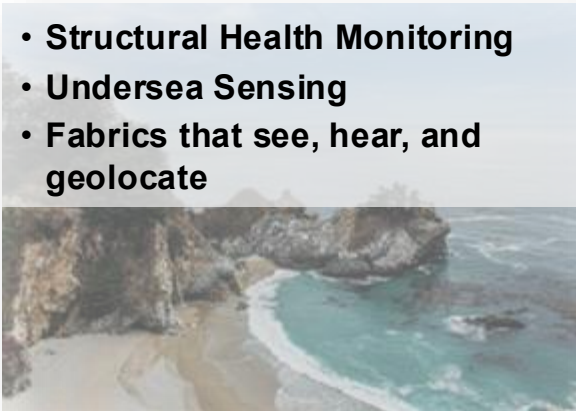
Power and Communications

- Performance communications, power and data
- RF Signature Management
- Low SWAP fabric antennae



Large-Area Distributed Sensing

- Structural Health Monitoring
- Undersea Sensing
- Fabrics that see, hear, and geolocate



Digital Engineering

- Fiber and textile digitalization
- Textile Digital Design Tools
- Material Libraries
- Advanced Test Methods



Manufacturing Scale-Up

- Automated textile manufacturing
- Fiber and textile process engineering



Sustainable Textiles & Processes

- Biodegradable PPE
- Textile Circularity
- Bioderived Fibers
- Biomanufacturing



FABRIC INNOVATION NETWORK

Current Member Capabilities



144 Members: 31 Start-Ups 25 Academia 10 Non-Profits 61 Manufacturers 17 Industry

AFFOA's Ecosystem



Advanced fabrics enterprise enabled by collaborations across academic, industry and government partners

- Broad range of manufacturing capabilities
- Differentiated and trusted domestic supply chain
- Partners for technology transition, education and workforce training

- Distributed network of advanced fiber and fabric development capabilities
- Innovation hubs focused on R&D, process development and EWD activities
- 3 FDCs: [Pennsylvania FDC](#), UMASS Lowell FDC, Defense FDC

- New technologies, business models and use cases
- Agile commercialization of dual-use products



- Convener & connector
- Supply chain builder
- Technical consultant on advancing MRL
- Integrated system prototyping partner
- Development partner (SBIRs, BAAs)
- Technology transfer facilitator
- Industry led roadmap facilitator

- Complementary technology and manufacturing competencies for broader impact

- Applications & product needs
- National Security & Commercial interests

- New technologies; R&D laboratories
- Education and workforce development hubs

Project Engagement Opportunities



Customer Directed & Proprietary Projects

AFFOA Directed Projects

Co-Proposal & Joint Technical Development

Member or AFFOA-Led Projects in Support of Sponsor Problem Statements (Commercial or DoD)

Novel Closed Loop Heated Handwear Solution for Arctic Environments



BETHEL INDUSTRIES

Self-Cleaning Textiles for High Touch Surfaces



accenture



University of Colorado
Boulder

Project Engagement Opportunities



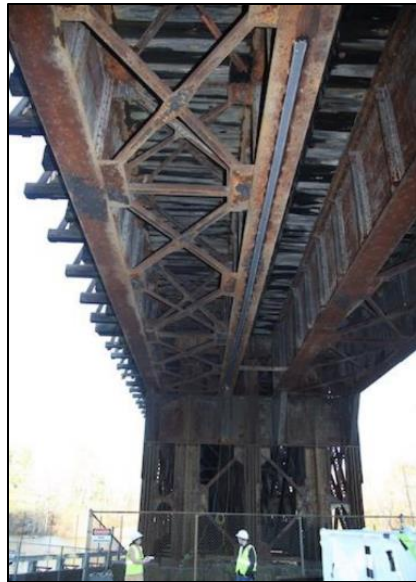
Customer Directed &
Proprietary Projects

AFFOA Directed Projects

Co-Proposal & Joint
Technical Development

Project Calls and Member Support for Internal Development Projects

Sensing Textiles for Civil Infrastructure Monitoring



SAINT-GOBAIN



*Re-Programmable Photochromic Color Change for
On-Demand Personalization*



Project Engagement Opportunities



Customer Directed & Proprietary Projects

AFFOA Directed Projects

Co-Proposal & Joint Technical Development

AFFOA and Members Collaborate on Technical Development for External Funding

\$11M RACER Award for PPE material advancements and automated manufacturing solutions

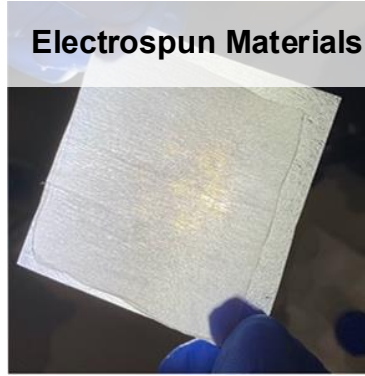
Subaward partner for SBIR to develop EMG sensing calf sleeve for physiotherapy progress evaluation

NIST

Biodegradable PPE



Electrospun Materials



Automated PPE Production



BETHEL INDUSTRIES



Before AFFOA



With AFFOA

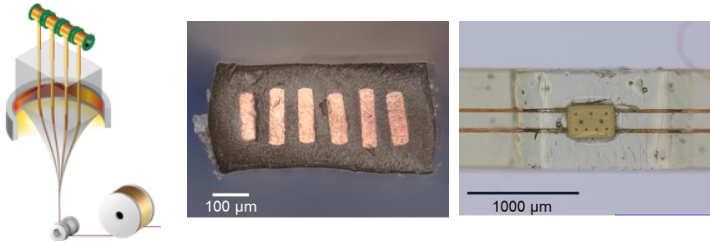


AFFOA HQ Technical Capabilities



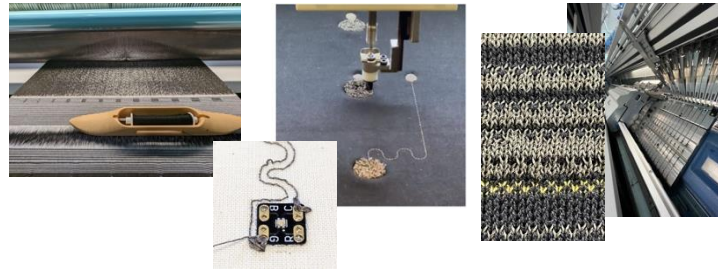
Multi-material Fiber Formation

Unique thermal fiber draw process that can produce advanced multi-component fibers



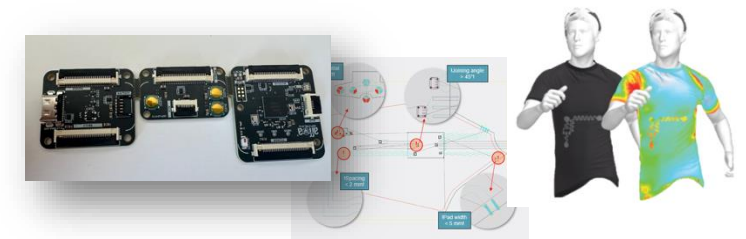
Textile Formation

Weaving, Knitting, Embroidery



Soft System Design & Digital Engineering

Leveraging range of expertise, digital design tools, and characterized material library



Fiber, Fabric & Electronics Testing & Evaluation

Can test against standardized test methods or develop custom SOPs based on need



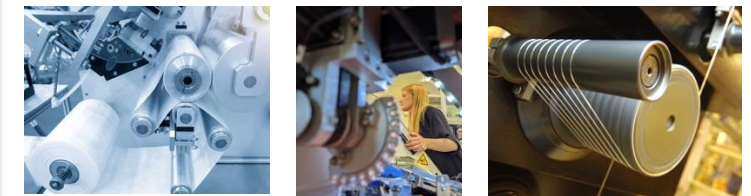
System Integration & Prototyping

Leveraging expertise and specialized equipment to design and iterate advanced fabric products



Process Engineering

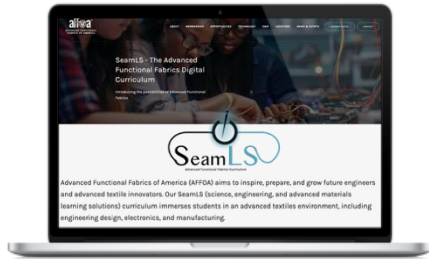
Broad expertise from lab scale to industrial mass production



AFFOA's EWD Initiatives



AFFOA's education and workforce development initiatives focus on supporting industry needs and learning across the academic lifecycle, from cradle to career.



Thrust 1: Ignite STEM Passion and Direct to Career Connections for New/Emerging Workforce through modular and scalable online high school curriculum resources and STEM Kits

Thrust 2: Establish Training and Upskilling Program Suite for Existing/Emerging Workforce Needs by establishing and promoting industry recognized credentials, badges, apprenticeships



Thrust 3: Support Interdisciplinary Engineers, Designers and Innovators by growing suite of programs aligned to current and emerging technologies (hands-on workshops, capstones, etc.)

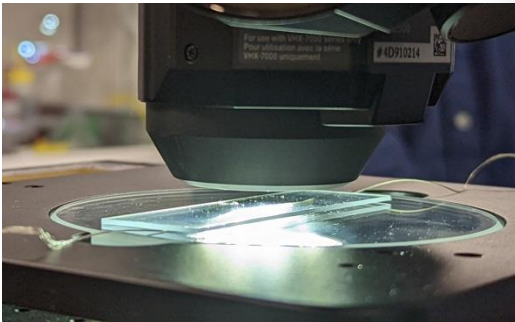
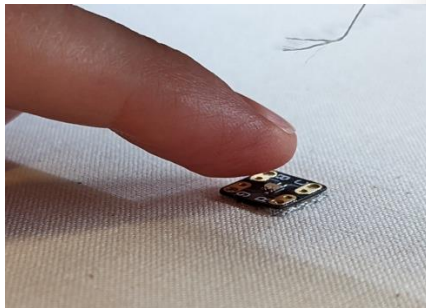
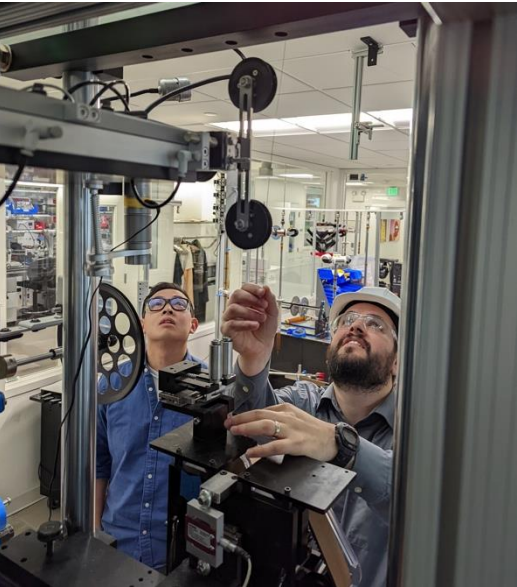
Thrust 4: Build Textile Industry Awareness and Share Workforce Development Best Practices by connecting stakeholders and thought leaders



Thrust 5: Develop AFFOA's Model for Modernization of the Industry through Workforce Innovation Hub Model

by identifying and promoting big solutions to industry's need to capitalize for modernized factories of the future (technology + industry + workforce holistic solutions)

How AFFOA Can Support



Technology development partner

- Leverage AFFOA HQ's broad set of expertise, technology maturation and product development capabilities

Leverage existing MII infrastructure and expertise

- Industry capability and MRL assessments
- Testing & Evaluation of materials and systems
- Facilitated access to expertise, prototyping and manufacturing capabilities across the Fabric Innovation Network and FDCs

Facilitate Transition of Prototypes to Manufacturing

- Design for Manufacturability, Process engineering and Scale-Up
- Facilitate technology transition through industry partnerships
- Education & Workforce Development programs