

# DCS Littleton Capabilities Briefing

May 11, 2022

# Overview



- DCS provides advanced technology engineering and management solutions to customers in the national security sector.
  - Founded in 1977
  - Employee-owned
  - Solid growth record
    - Consistent record of organic growth
    - Estimated FY2020 Revenue: ~\$393M
  - More than 1,800 employees nationwide

Headquarters DCS Corporation  
6909 Metro Park Drive  
Alexandria, VA 22310



# DCS Littleton Facilities Overview



## Littleton, MA (295 Foster Street)

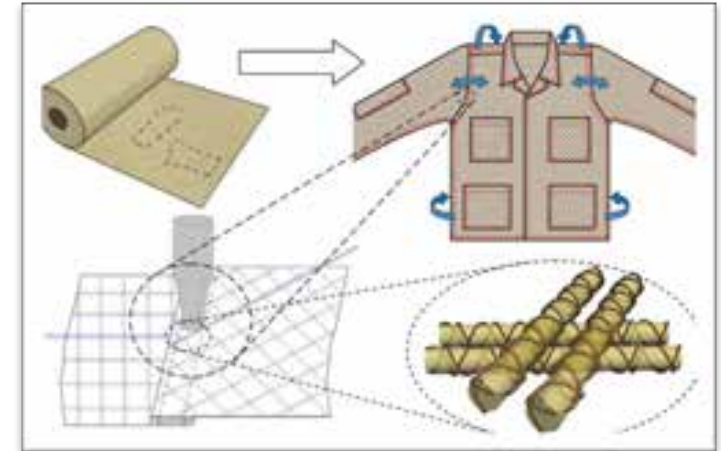


- 44,000 ft<sup>2</sup> facility supporting engineering, experimentation, and light manufacturing
- 5,000 ft<sup>2</sup> of laboratory space in 6 rooms, configured to support electrical system assembly/integration including;
  - Chemical synthesis and analysis
  - Materials fabrication and analysis
  - RF component testing & evaluation
  - E-Textile/wearables development, fabrication and testing
  - Classified facilities for secure prototyping, testing, and computing (NISPOM and ICD 705 facilities)
- 8,000 ft<sup>2</sup> machine shop
- 17,000 ft<sup>2</sup> manufacturing area for electronics, cable and harness assembly
- Cleared to store classified material up to the SECRET/SAR level.

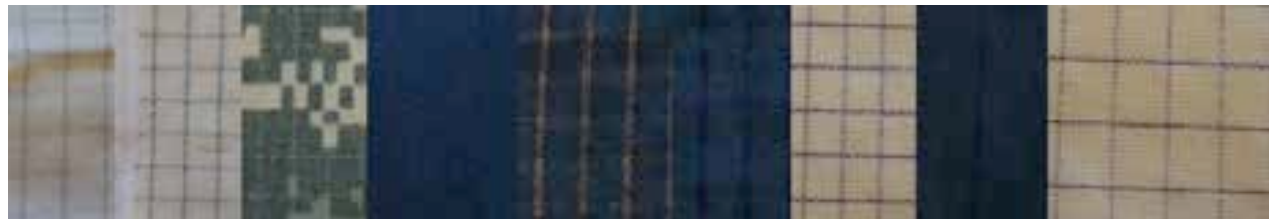
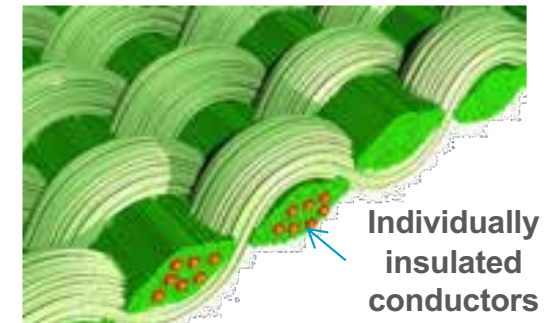


# Electro-Textiles Development

- Genesis: Identified need to create smart fabrics, with integrated electrical functionality, that can be cut and sewn to form broad-area/cross-seam networks in garments.
- DCS has developed a technology for:
  - Fabricating E-yarns having tailorable properties
  - Weaving & knitting these with conventional yarns to form embedded networks of insulated electrical paths
  - Forming complex power & data networks within finished garments using ultrasonic welding techniques
- Benefits:
  - Weight reduction
  - Snag hazard reduction
  - Improved mobility and comfort
  - Adaptable composition and appearance
- The key advantage of the DCS E-textile toolkit is low observability. Since conductors are integrated at the fiber level, the E-textile networks can be made to look and feel the same as conventional fabrics with no evident rigid components. Only by careful inspection can an observer even find where the networks are located

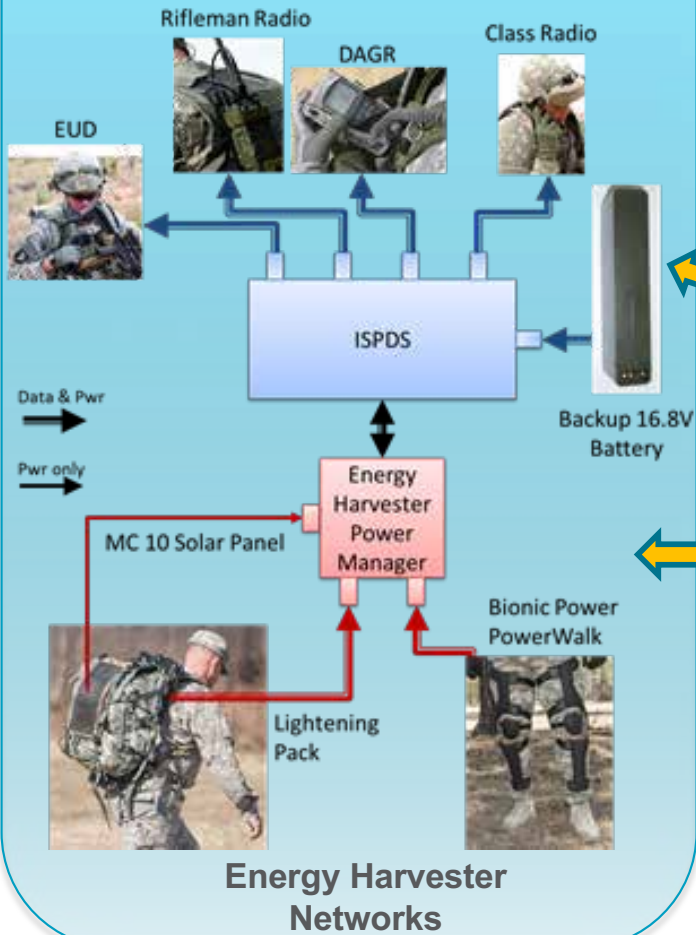


**DCS E-Textiles**

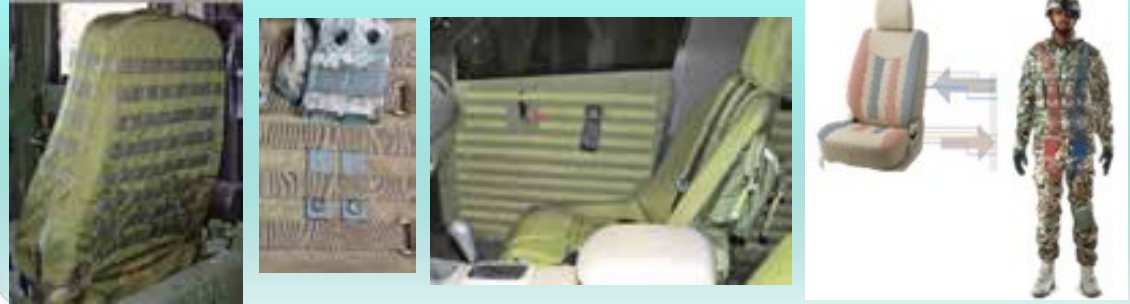


# Electro-Textile Applications

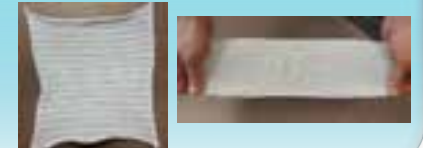
## Electronics Power/Data Networks for the Dismounted Warfighter



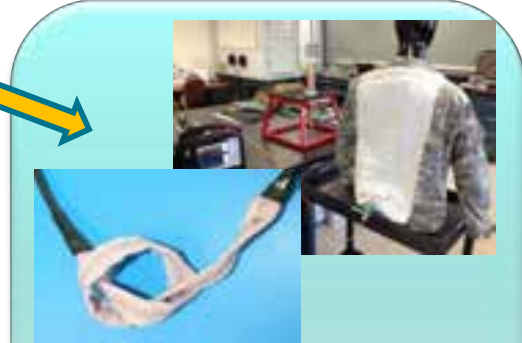
## Charging Networks for the Mounted Warfighter



## Stretchable E-Textiles For Physiological monitoring



Embedded electrical conductors in the fabric, selectively enabled to form power and data networks



## RF Application

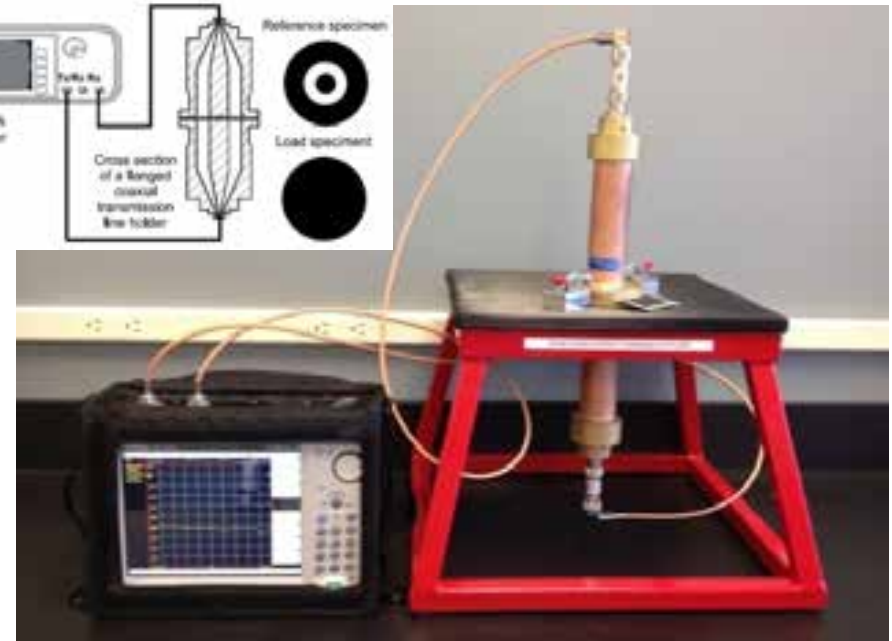
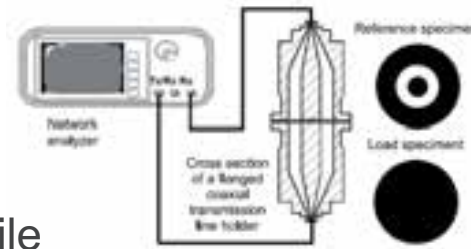
- Antennas
- Antenna Feed Lines
- Wireless Power Transfer

# Network Development and Capabilities Integration

- The Tailorability of DCS's E-textile toolkit has supported the development of wearable networks that incorporate:
  - electro-active materials: electrochromic fabrics, thermochromic fibers, thin film sensors, PV films/fibers, etc.
  - electronic devices: Optical sensors, radios, computers, physiological sensors, environmental sensors, displays, IMUs, GPS units, etc.
  - Conductive interfaces: flex circuits, wires, hook and loop, contact-based interfaces, etc.
- Supporting the development of reliable E-textile networks has involved the development of methods for:
  - Designing, fabricating, and testing complete systems that include conductive and dielectric fabrics for EMI shielding and impedance control.
  - Assessing the real world electro-mechanical performance of wearable systems (chemical exposure, water immersion, launderability, abrasion, etc.).



Cutaway of E-textile power and data network showing double layer of EMI shielding.



Shielding Effectiveness Test Setup

# Contact Information



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