E-TEXTILES

Point of Contact

Joshua Fortin Smith, Ph.D.

tel 978.707.7056

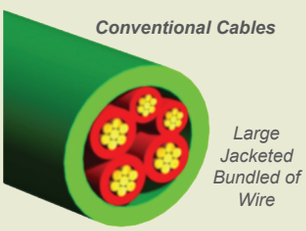
jforinsmith@dcscorp.com

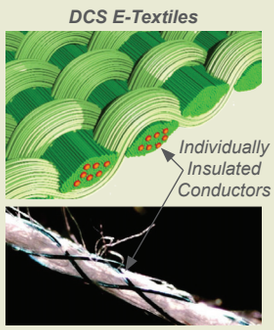
DCS develops advanced E-textile technologies that embed power, data, and sensing capabilities directly into fabrics using standard textile manufacturing methods. These lightweight, breathable textiles deliver cable-like electrical performance while reducing bulk and improving comfort and modularity for the wearer. Supported by patented ultrasonic welding techniques, integrated EMI shielding, and precise signal-line engineering, DCS's E-textiles enable reliable high-speed data transmission for demanding military applications. With a fully equipped E-textile laboratory in Westford, MA, and a robust domestic supply chain, DCS produces durable, standards-compliant prototypes and systems. These capabilities support a wide range of applications—from garment-based electrical networks and wearable systems to sensing platforms and signature management solutions.

E-TEXTILE DEVELOPMENT

Challenge: Create smart fabrics, with integrated electrical functionality, that can be cut and sewn to form broad-area/cross-seam networks in military garments.

- Etextile systems available for:
  - Power supply
  - Personal area networks
  - Textile Antennas
  - Physiological monitoring
  - Signature management
  - IR markers
- Key benefits:
  - Weight reduction
  - Snag hazard reduction
  - Improved mobility and comfort
  - Discreet personal-area data transfer
  - Adaptable composition and appearance





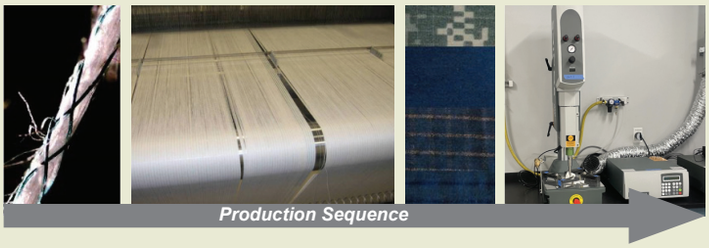
CABLE PERFORMANCE

- **Dimensional:** The E-textile portion of any assembly conforms to the following specifications for the Nett Warrior System:
  - Width
    - For C1 Cables, 0.800 in +/- 0.01 in (fits in standard laser cut carriage system on MSV)
  - Length (application specific)
  - Thickness
    - For C1 Cables, 0.040 in +/- 0.002 in
- **Mechanical:** The E-textile conforms to the following specifications:
  - Tensile Strength: >3,500 PSI

E-TEXTILE TECHNOLOGY

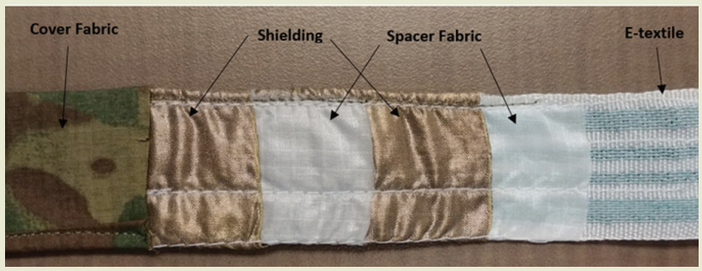
DCS uses a four-stage process for fabrication and functionalizing E-textile networks:

- E-Yarn Construction
- Weaving
- Printing/Finishing
- Network Formation



ELECTRICAL TEST REPORTS

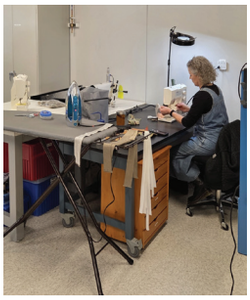
- **Electrical Efficiency Testing:** Demonstrated equivalency to standard Nett Warrior cables.
- **Human Factors Testing:** Demonstrated reduced physical signature, weight, and snag hazard relative to Nett Warrior cables.
- **EMI Testing:** Demonstrated equivalency with Nett Warrior cables based on a subset of MIL-STD-461 tests (>60 dB over the UHF and higher frequencies).
- **USB 2.0 Testing:** Demonstrated ability to satisfy all USB 2.0 requirements – Diff impedance: 90Ω +/ 15%, Diff skew delay < 0.7 ps, propagation delay: <20 ns.



WESTFORD E-TEXTILE DEVELOPMENT CENTER

DCS has the capability to design, fabricate, and evaluate textile articles, including those that feature embedded electrical functionality.

- Fiber/Yarn characterization
  - Mechanical
  - Electrical
  - Melt Properties
- Fabric Characterization
  - Electrical
  - EMI Shielding
  - Environmental
- Network Formation
  - Ultrasonic welding station
  - Portable ultrasonic welding system
  - Soldering stations
- Network Characterization
  - Impedance (LCR) Meter
  - Time-domain reflectometer
  - Oscilloscopes
- Prototype Fabrication
  - Cut and sew stations
  - Sewing machines
  - Sergers
  - Rivet and fastener presses
- System testing and qualification
  - Current capacity
  - Environmental
  - Launderability
  - Signal Integrity



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