

E-TEXTILES



Point of Contact

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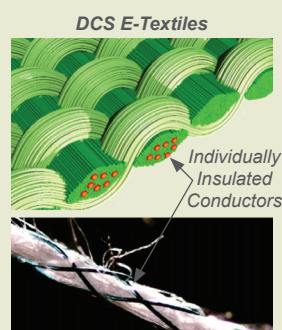
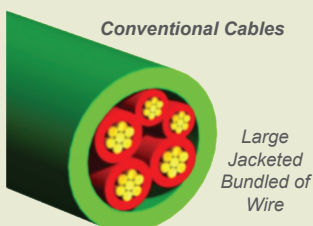


DCS develops advanced E-textile technologies that embed power, data, and sensing capabilities directly into fabrics using standard textile manufacturing methods. These lightweight, breathable textiles deliver cable-like electrical performance while reducing bulk and improving comfort and modularity for 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

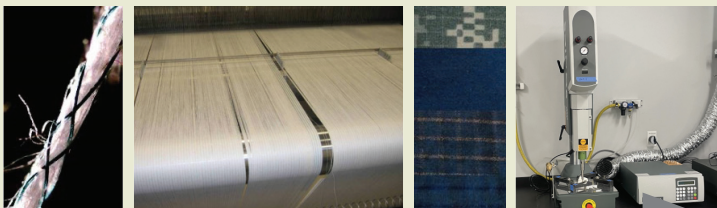




E-TEXTILE TECHNOLOGY

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

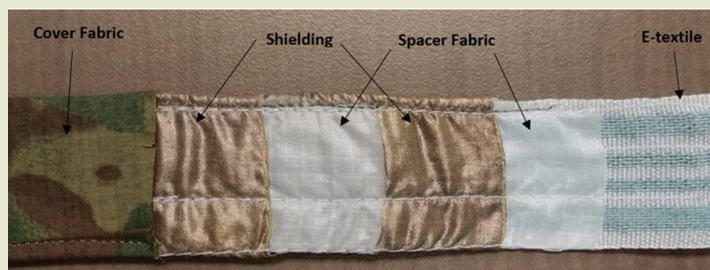
- E-Yarn Construction
- Weaving
- Printing/Finishing
- Network Formation



Production Sequence

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: $90\Omega \pm 15\%$, 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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