

HIGH PERFORMANCE FIBER FACILITY EQUIPMENT:

Molecular / Atomic Structure



X-Ray Diffractometer



Nuclear Magnetic Resonance Spectrometer (NMR)



Optical & Mechanical Analysis



LEFT: Pulsed Laser



RIGHT: Instron®

Microscopy

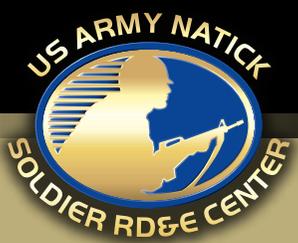


SEM



CLOCKWISE FROM TOP: TEM, Atomic Force Microscopy, ESEM

HIGH PERFORMANCE FIBER FACILITY (HPFF)



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HIGH PERFORMANCE FIBER FACILITY (HPFF)

HIGH PERFORMANCE FIBER FACILITY:

The High Performance Fiber Facility (HPFF) will combine NSRDEC, academia and industry expertise in novel fiber/textile technology to invent and rapidly transition new optical, electronic, high strength, flame retardant and reactive materials to Warfighters and First Responders.



Spunbond Nonwoven Textile Equipment

Hills, Inc.



Homo/Bi/Tri-Component Fiber Extruder

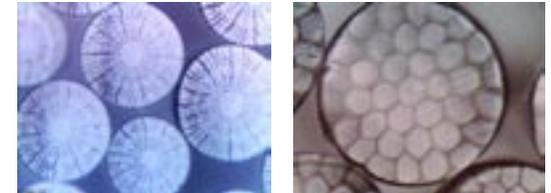
NOVEL BI/TRI-COMPONENT FIBER DEVELOPMENT AT NSRDEC:

- **Optical Fibers**
 - Optical Sensing and Communication
- **Electronic Fibers**
 - Conducting Core/Polymer Sheath Fibers for E-Textile Applications
- **High Strength Fibers**
 - Islands-in-the-Sea Nanofibers for Soft Armor or High Strength/Impact Composites
- **Flame Retardant Fibers**
 - New Polymers or Nanoparticle Additives for Improved FR
- **Reactive Fibers**
 - Tri-component Fibers for Smart Insulation

NOVEL EXTRUSION PROCESSING:

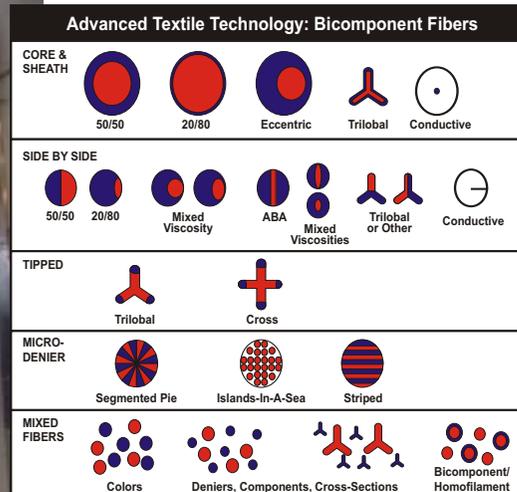
Bi-Component Islands-In-The-Sea (INS) Fibers

- **Applications:** Production of melt processed nano- or micro-fibers



Side-By-Side Tri-Component Fibers

- **Applications:** Create new fiber shape or compatibilize two different polymers



Hills, Inc.

Bi/Tri-Component Sheath/Core Fiber

- **Applications:** Concentration of reactive components at the surface of the fiber for production of a conductive core/insulating sheath fiber
 - CB decontamination
 - Antimicrobials
 - Optical Communication
 - Sensors
 - Electronic textiles

