

# Working For You

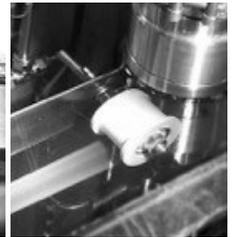
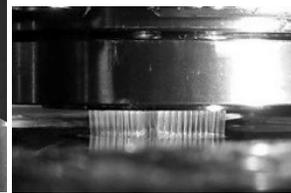
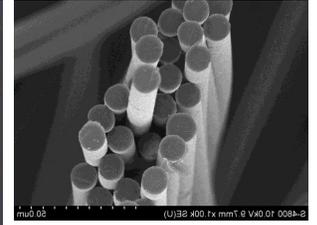
Presented by the University of Kentucky's Center for Applied Energy Research

## Fiber Development Laboratory

- The UKY CAER Fiber Development Laboratory contains the largest solution spinning line found in an academic setting in North America. The Carbon Materials research group has decades of experience in process development for experimental polymers and fibers. The fiber development laboratory bridges lab-scale to pilot-scale manufacturing development.



UKY CAER multifilament, continuous tow solution spinning line



(Top Left) Over 700 m of 0.5k tow continuous PAN fiber. (Top Right) SEM cross section of PAN fiber. (Bottom Left) Air-gap solution spinning. (Bottom Right) Wet-jet solution spinning

### Fiber Development Laboratory Research Areas include:

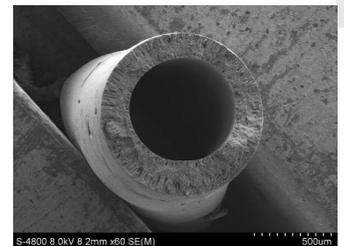
- Multifunctional fibers, smart textiles, and composites
- Electrically conductive/thermal textiles
- Polymeric precursor fibers
- Use of bio-derived polymers
- Thermally conductive composites and interfaces
- Incorporation of activated carbons for lightweight/wearable chemical/biological protection

### Details of the UKY CAER Solution Spinline:

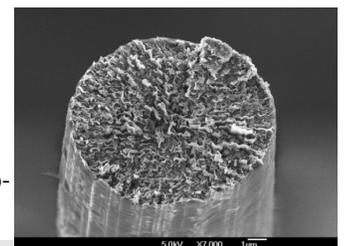
- Solution spinning (PAN as precursor for carbon fiber, PES, biopolymers, etc.)
- 8 hour day start up, operation and stop—no shift work required
- Multifilament (500-count), continuous tow wet-jet and/or air-gap solution spinning
- Dope formulation from polymer powder, including rheological characterization
- Spinline includes: dope filtration, jet formation, coagulation, washing, stretching, hot-stretching, spin-finish application, drying and winding

### Other Capabilities:

- A hollow fiber/multicomponent fiber spinline for developing membrane separation and multicomponent fibers
- Melt spinning of thermoplastic polymers, coal-tar and petroleum pitch (isotropic and mesophase)



PES hollow fiber



Mesophase pitch fiber



Contact

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