

Index By Core Competency

Material Science

Research in the design, development, manufacture and measurement of natural and synthetic polymers and fibers, including polymer mixtures and additives.

- Chaotic Mixing During Melt Spinning** 109
By inducing and maintaining chaos during mixing, can we extrude filaments with intrinsic fibrous reinforcement? [C96-1]
- Rapid Solidification of Polymeric Fibers*** 159
We are developing macroscopic and molecular models for the rapid directional solidification of polymeric fibers. [G96-19]
- Molecular Structure of High Tech Fibers** 91
We are relating a fundamental molecular understanding of polymer chemistry and physics to the final structure-property development in high technology fibers. [C95-4]
- Fiber Microstructure and Fatigue** 165
We are developing a fundamental understanding of how fiber microstructure responds to asymmetrical stress for managing damage accumulation from torsional and bending fatigue. [S94-2]
- Using Biotechnology for New Fibers** 53
Using microbes, we have produced novel polypeptide structures which show promise of being melt-extrudable into fibers. [A96-2]
- Low Cost, Tough Industrial Fiber** 133
We are seeking synthetic fibers with the toughness of spider silk drag filaments. [G95-8]
- Designing Dye Molecules Using Molecular Orbital Theory** 233
Using molecular orbital theory, we are designing dye molecules by computer. [S95-22]

Fabrication

Research in the design, development, manufacture and measurement of fibrous structures, including yarns, textiles, garments, nonwovens, carpets, coated fabrics, papers, preforms, etc.

- Fiber Friction** 59
We are developing methodology to fundamentally understand and characterize staple fiber friction. [A96-3]
- Nonlinear Phenomena in High-Speed Yarn Transport** 183
We are developing a fundamental understanding of nonlinear yarn tensions and balloon shape fluctuations during the high speed translational and rotational movement of yarns. [S94-9]
- On-Line Measurement of Fabric Properties** 67
We are developing a system to measure yarn and fabric tension and fabric bending properties on-line. [A96-4]
- Computer Aided Apparel Equipment Design** 223
We are applying computer-aided-engineering techniques to develop precise fabric handling capabilities for apparel assembly processes. [S95-20]

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Shuttle Plate Braider	101
We are refining the control/operating software and expanding the flexibility of the shuttle plate braider to permit the weaving of more moving yarn ends. [C95-9]	
Composites for Prostheses	71
We are developing ways to improve fatigue resistance in fiber-reinforced elastomeric bearings by using boundary lubrication theory and a new class of materials. [C94-2]	
Comfortable Barrier Textile Systems	243
We are developing fabrics and garment systems that protect the wearer against liquid and air-borne hazards, yet are comfortable and cost effective. [S95-24]	
Geotextiles	1
We are investigating the structure-performance relationship of geotextiles, specifically frictional characteristics and deformation to uniaxial loading. [A94-8]	

Chemical Modification

Research in dyeing, finishing and waste reduction in textile processes.

Real-Time Control of Batch Dyeing	203
We have developed a novel data acquisition and control system that allows real-time monitoring of individual dye concentrations in mixtures, pH, temperature and conductivity. [S95-4]	
Enzymatic Dyeing and Finishing	49
We are developing a fundamental understanding of the mechanism of enzymatic hydrolysis in conjunction with dyeing and finishing of cellulosic fibers. [A96-1]	
Reusing Reactive Dyebaths	153
We are developing an anaerobic bioreactor system to remove color and reuse spent reactive dyebaths. [G96-2]	
Dye Diffusion in Polyamide and Polyester Fibers	213
We are developing a fundamental understanding of diffusion of dye into fibers to eliminate fabric dye streaks by chemical means. [S95-7]	
Supercritical Fluid	81
We are researching the properties of supercritical fluids used both as processing fluids and for analytical applications such as extraction. [C95-3]	
Ultrasonics to Dye and Dry	143
We are conducting fundamental investigations of ultrasound assisted wet processing. [G95-13]	
Quick Response Printing	123
We are developing electrophotographic and inkjet dry printing processes for quickly applying complex patterns to textile substrates without effluent. [G95-1]	

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Intelligent Systems

Research in systems to enable rapid response, including computer modeling, sensor technology, expert systems, customer interactive design, market research and demand-activated, closed-loop production systems.

Artificial Life Simulation of Textile/Apparel Marketplace	31
We are examining the complex self-organizing system of the textile/apparel marketplace to detect emerging behaviors. [A95-20]	
Mass Customization	21
Is the consumer ready for custom made garments? [A95-19]	
Intelligent Systems for U.S. Softgoods Complex	193
We are developing flexible software tools and analysis techniques to support strategic planning and decision making in the U. S. softgoods complex. [S95-2]	
Integrated Information Systems for Textile Manufacturing	253
We are designing integrated information management systems for textile manufacturing operations which provide for responsive dynamic networking of organizations. [S96-15]	
Real-Time Fabric Defect Control	113
We developed a powerful “fractal scanning” tool to transform the 2-D digitized images of woven fabrics into 1-D data streams. [G94-2]	
Part Layout in Apparel	11
We are developing a computer-aided apparel manufacturing system for apparel design and layout. [A94-13]	
On-Line Inspection of Sewn Seams	173
We are developing techniques to monitor and control sewing machine seam construction on-line. [S94-4]	
Demand Responsive Marketing	31
Global consumer studies show potential new export opportunities for U.S. apparel. [A95-23]	