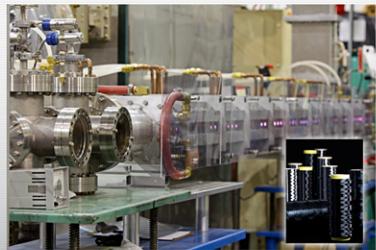


ORNL/Industry Collaboration: **From Concept to Product**

Integrating innovative and advanced materials, processing and manufacturing technologies with secure, dedicated prototype and operational product development

Innovations in Manufacturing

Enabling the future of industry in the United States



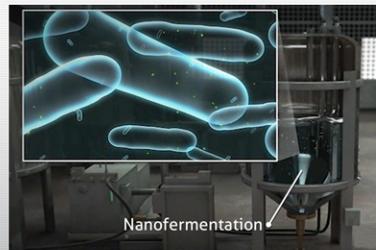
Composites and Carbon Fiber

Low-cost, lightweight, and higher-performance carbon fiber through advanced energy-efficient manufacturing



Magnetic Field Processing

Dramatically enhances material properties beyond today's limits, including increasing fatigue life and strength, and providing stress relief

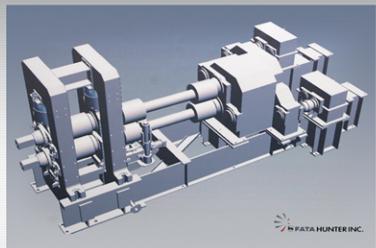


Low-Temperature Material Synthesis

Bio-Synthesis of unique materials at room temperature, enabling low-cost products

Lightweight Metal Processing

Technologies for low-cost titanium, magnesium and metal matrix composite components



Roll to Roll Processing

High-temperature processing over broad areas on low-temperature substrates



Additive Manufacturing

A broad range of direct manufacturing technologies, including electron beam melting, ultrasonic, and laser metal deposition.



Unique Capabilities

Spallation Neutron Source

The world's most powerful accelerator-based neutron source



Advanced Characterization

Exhaustive, world-leading materials characterization facilities



Carbon Fiber Technology Center

North America's most comprehensive carbon fiber material and process development capabilities

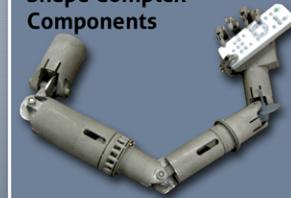


High-Performance Computing

World's most powerful open scientific computing facility

Products

Additive Manufacturing, Enabling Rapid, Near-Net-Shape Complex Components



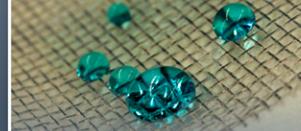
Titanium prosthetic arm with 4 times reduction in cost and weight

Out of Autoclave Processing



Rapid, low-cost, electron beam cured composite hood

Multifunctional Surface Systems



Scalable manufacturing process for nanostructured materials exhibiting superhydrophobic properties

Rapid Energy-Efficient Heating Technologies for Improved Aluminum Products



A million plus impellers have been deployed in Cummins diesel engines

Low-Cost Titanium



30-40% weight reduction demonstrated on Joint Light Tactical Vehicle door

Structural Amorphous Materials



Over 20% improvement demonstrated in disc cutter life for Tunnel Boring Machine applications



A unique partnership, from concept to final product