

Eltron Research & Development

Contract Services

Materials Research & Materials Testing

Eltron Research & Development's multidisciplinary approach to materials R&D includes the fields of materials science and chemistry, engineering, and materials testing and characterization. Eltron has broad capabilities in these areas as well as expertise in polymers, ceramics and composites, and complete thermal, physical and mechanical performance evaluation.

Eltron draws on decades of research experience to develop, produce and analyze customized materials. In addition to traditional materials development methodologies, we are exploring revolutionary approaches such as catalytic-microwave assisted processes and novel approaches to composite fabrication methods and chemical vapor deposition.

Materials Development

Successful programs in advanced polymers and composites development includes:

Engineered Polymers

- Formulation and processing of radiation-resistant resins
- Surface functionalized carbon nanotubes
- Particle dispersion

Ceramics Development

- Inorganic coatings on metals for corrosion protection
- Inorganic coatings on polymers for thermal and electrical protection
- Novel materials
- Supported thin films for gas phase separations processes
- High surface area powders

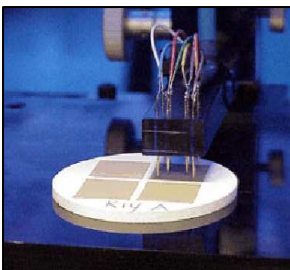
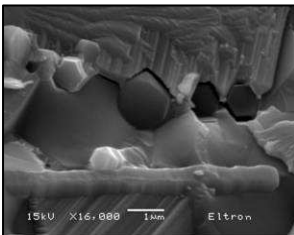
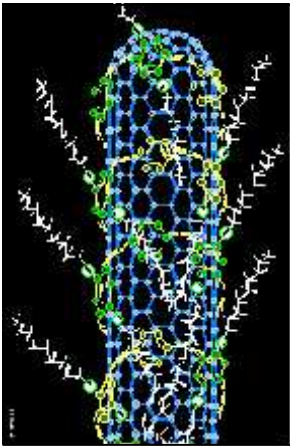
Advanced Composites

- Resin transfer molding (RTM) fabrication of polymer matrix composites
- High Temperature Vacuum Assisted Resin Transfer Molding (HTVARTM) of carbon fiber reinforced polymers for aerospace engine applications
- Transparent and conductive nanocomposite thin films for satellite applications
- Multilayer composite armor for protection of military vehicles
- Novel fabrication methods for ceramic matrix composites

Materials Processing

Eltron has the capability to process polymers, ceramics and composites for a wide range of applications. Materials processing capabilities include:

- High-temperature RTM unit for liquid impregnation fabrication of fiber reinforced polymer matrix composites



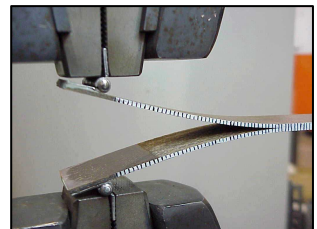
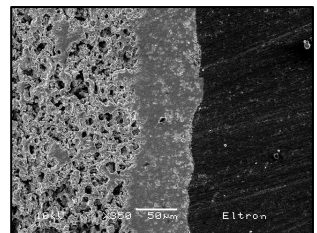
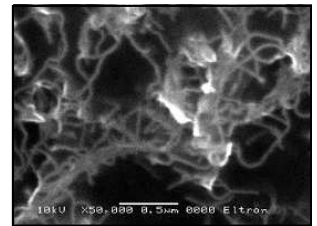
- Vacuum Assisted RTM
- Compression molding of thermoplastic and thermosetting prepreg systems
- Uniaxial presses and cold isostatic presses
- Ball milling, vibratory milling and high speed attrition milling
- Tape casting
- Kilns and furnaces to heat above 2000°C in any atmosphere, and to almost any shape



Materials Testing

Eltron also offers materials testing services, enabling us to provide data on the properties of materials synthesized in our lab or provided by our clients. In-house analysis equipment used to support materials research includes:

- Cone and Plate Viscometer with Temperature Control for viscosity measurements to 300°C
- Brookfield Viscometer with associated thermoset Instron 1137 30,000 lb Capacity Tension/Compression test machine with cryostat and furnace
- Mechanical testing and characterization in tension and compression from -196°C (77K) to 800°C and 30,000 pound capacity
- Thermal analysis:
 - * Differential scanning calorimetry (DSC): Glass transition, melting, cure temperature, cure kinetics
 - * Differential thermal analysis (DTA): Phase transitions
 - * Thermogravimetric analysis (TGA): Thermo-oxidative stability, decomposition
 - * Thermomechanical analysis (TMA): Coefficient of thermal expansion, heat deflection temperature, glass transition
- Large suite of microscopic tools including a scanning electron microscope (SEM) with electron microprobe (EDX)
- X-ray diffraction for phase identification
- Surface area measurements by gas adsorption
- Particle size analysis
- Four-probe conductivity testing under controlled environments



Eltron Research & Development Inc.

Eltron Research & Development commercializes novel technologies involving energy, chemicals, advanced materials and environmental systems.