The University of Alabama at Birmingham (UAB) has several capabilities in performance evaluation & characterization of advanced materials. The focus of the work ranges from routine mechanical testing, to development of specialized test fixtures and methods, microstructure & imaging.

**Universal Testing Machine**

**SATEC T-5000 POWER SCREW MACHINE**
- ASTM Test Methods for Flexure, Tension, Compression, Shear, Static Indentation

**Scanning Electron Microscope**
- JEOL JSM 5800 Scanning Electron Microscope
  - Interface characterization
  - Failure analysis
  - Failure modes
  - Material microstructure analysis

**Instrumented Drop Tower Impact**
- Low velocity impact testing, replicates debris impact
  - Energy-Time, Load-Deflection, Absorbed Energy
  - Contact analysis, Indentor influence
  - Rebound arrestors to prevent multiple impacts

**Vibration Testing**
- Bending and torsional vibration excitation of large structural composite panels used in boats, buildings, aircraft and vehicles. Frequency, Damping Ratio, Mode Shape Determination
Spectroscopic Thermal Analysis & Characterization

- Bruker 400 MHz Fourier Transform Nuclear Magnetic Spectrometer (FTNMR)
- TA Instruments 2950 Thermal Gravimetric Analyzer
- TA Instruments 2980 Dynamic Mechanical Analyzer
- Nicolet Micro-Raman Spectrometer
- Nano-indenter
- TA Instruments AR2000 Rheometer (acquisition in process)
- TA Instruments Q100 Differential Scanning Calorimeter

Structure Morphological Characterization

- Siemens D-500 X-ray Diffractometer
- Rikert Ultramicrotome
- Vacuum Evaporator

Other Equipment

- Complete microscopy laboratory equipped with cutting edge image acquisition and analysis technology
- Structural frames for large-component testing, flexural, proof loading and buckling
- Environmental exposure chamber for submitting composites to harsh environments
- Ballistic and high velocity impact testing
- Melt Flow Index (MFI) Measuring Device
- Acoustic Impact Nondestructive Evaluation
- Grindosonic – Elastic Modulus Measurement
- Quasar – Ultrasonic NDE / Dynamic Modulus Characterization
- Dispersion mixers for Nanomaterials Research

Performance Evaluation & Characterization Capabilities for Advanced Materials and Structures, University of Alabama at Birmingham
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