



Facility Factsheet

Aerospace Power Materials and Components (APMC) Laboratory

Description:

This laboratory provides a safe facility for areas of energy conversion technologies, including superconductors, cryogenic power devices, carbon nanotubes (CNT), thermoelectric and magnetics.

Capabilities:

Superconductors, Thermoelectrics, CNT: Material development is supported through dry powder and wet chemistry labs. Samples are facilitated by Laser Deposition, Sputter Rigs, and High Temp Furnaces. Measurements are done by a Physical Property Measurement System (PPMS) supporting Vibrating Sample Magnetometer (VSM), Alternating Current Transport (ACT) and Thermal Transport (TTO). A fully automated Power Factor Screening Instrument (PFSI), and an X-Ray diffraction system as well as cryo coolers, in-field magnets, and AC Loss systems are utilized.

Magnetics: Synthesis and characterization tools include a high purity glovebox, a superconducting vibrating sample magnetometer, inductively heated hot press and isostatic presses, high frequency and high power hysteresis graphs and a differential scanning calorimeter.

Purpose:

Research efforts cover the spectrum of basic science and technology development including theory, modeling and simulation, development and science of materials, and devices and system applications.



Products:

Specific applications for superconductors and cryogenic power devices include MW-class power transmission cables, superconducting magnetic energy storage (SMES), high-power current switches, distributed electric propulsion for more-electric-aircraft, power systems for RPA, low-power electronics and devices, and rotating machine generator and motor technology.

Magnetic materials research focuses on developing improved advanced permanent (hard) and electromagnet (soft) materials for use in future Air Force space and aircraft weapon systems.

Thermoelectrics material research focuses on producing energy capture devices to improve overall power system efficiencies. CNT research focuses on producing improved heat transfer devices.

Availability:

Primarily in-house and related DoD contractor research. Other U.S. Government agency, DoD contractor and commercial customer programs upon request. Contact 937-255-6242.

