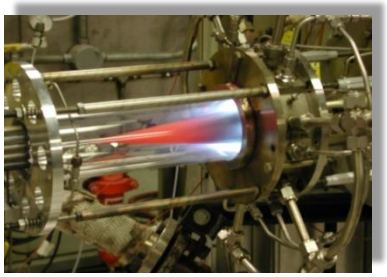
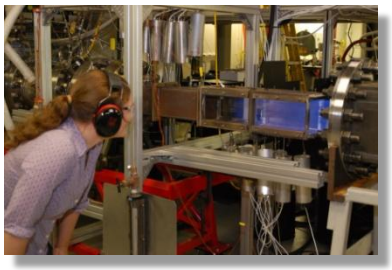
Low-Pressure Combustion Research Complex (LPCRC)





Description:

The Low-Pressure Combustion Research Complex (LPCRC) stretches over three laboratories in building 490. These labs are used to study fundamental, bench-scale combustion processes and gas turbine engine hardware. The available test rigs include a well-stirred reactor, single-cup combustors, augmentors and advanced combustor concept rigs. Experiments range from the fundamental science of combustion chemistry, to component technologies such as nozzle testing, thermal barrier coating testing, fundamental combustor aero studies as well as ignition systems characterization. A wide variety of instrumentation is available to measure pressures, temperatures, flow rates, fluid velocity, exhaust gas species, particulate matter, transport and evaporation phenomena, fuel injection spray characteristics, and kinetics. Laser-based diagnostics and quantitative imaging devices such as Phase Doppler Particle Anemometry for spray characterization, Laser Induced Florescence for temperature, species concentrations and for imaging flows and time-division-multiplexed hyperspectral absorptions spectroscopy for temperature are part of the available instrumentation to enable non-intrusive measurement of these combustion parameters. Test article air flow rates, temperatures and pressures are available up to 3 lbm/sec, 800^0F and 100 psig, respectively. In addition, the complex has been modified to operate at pressures up to 5 atm.

Purpose:

To perform basic research in combustion science including gas turbine augmentor technologies, evaluate advanced combustion, augmentor and combustor concepts in a bench-scale environment, test component technologies, long-term materials testing, take high-quality data for use in combustion CFD models using advanced laser diagnostics techniques aid engine companies in developing high performance, low-emissions combustors and augmentors and testing new diagnostic techniques.

Products:

Trapped Vortex Combustion (TVC) technology
Inter-Turbine Burner (ITB) concept testing
Ultra-Compact Combustor (UCC) concepts
Fundamental augmentor aero research
Combustion CFD code validation data collection

Availability:

Primarily in-house and related DoD contractor research. Other U.S. Government agency, DoD contractor and commercial customer programs upon request. Contact: 937-656-7280.