

Combustor Test Facilities at NASA Glenn Research Center

Glenn Research Center has seven **combustor test rigs** with varying capabilities offering state-of-the-art instrumentation and data systems.

Facility Description

The **Advanced Subsonic Combustion Rig (ASCR)**, NASA Glenn's unique high-pressure and high-temperature combustor facility (60 atmospheres), provides NASA and U.S. engine manufacturers the ability to quantify effects of high-pressure on combustor emissions, durability, and operability.

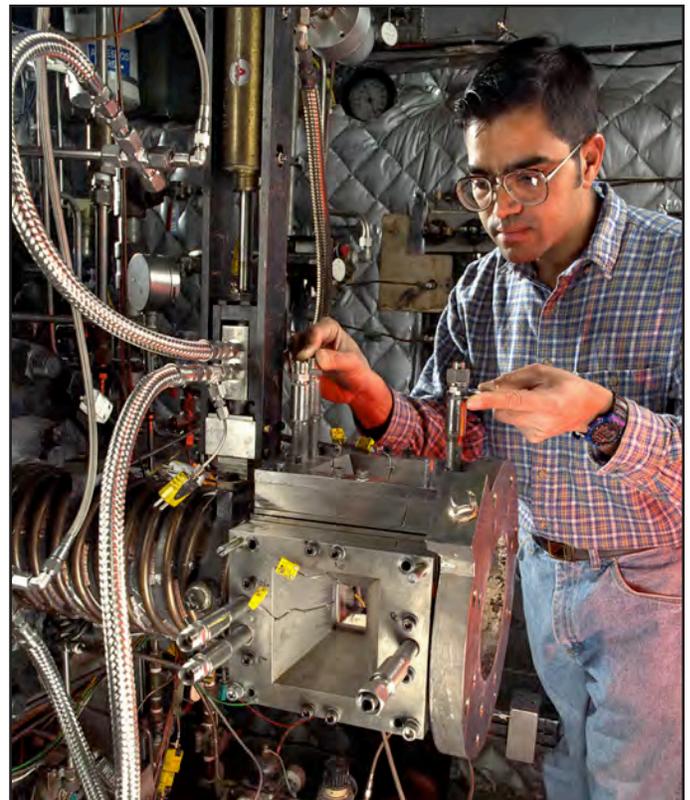
The **Engine Research Building (ERB)** complex houses over 60 test rigs supporting research on all aspects of engine development, providing superior testing of turbomachinery, aerodynamics flow physics, aeropropulsion heat transfer, mechanical components, and combustor facilities.

The **Engine Components Research Laboratory (ECRL)** houses two separate test rigs. Cell-1B is used to evaluate advanced concepts for full-scale engine and augmentor components. Cell-2B is used to test full-scale sea-level turboshaft engines.

Facility Benefits

- NASA Glenn has a wide range of combustor test facility capabilities including flametube testing, sector testing, full-annular testing, and full-scale jet engine testing
- ASCR is a one-of-a-kind facility able to simulate combustor tests up to 60 atmospheres
- ERB offers four test stands in CE-5B and CE-9B able to simulate combustor tests up to 30 atmospheres
- ECRL provides flexibility of testing a wide variety of test hardware configurations
- Features nonintrusive laser and gas analysis diagnostic measurements

- Accommodates in-house and private industry research programs
- Highly qualified staff of technicians, engineers, researchers, and operators
- High customer satisfaction



Combustion test facility (CE-5B) in ERB.

Commercial Applications

- Aircraft engines
- Aerospace propulsion
- Materials research and development

Programs and Projects Supported

- Fundamental Aeronautics Subsonic and Supersonic Research
- Ultra-Efficient Engine Technology (UEET)
- Low Emissions, Alternative Power (LEAP)
- Joint Strike Fighter

Capabilities

Combustor Facilities—ERB, ECRL, and ASCR

Facility	Test emphasis	Maximum pressure, psig	Maximum airflow, lb/s	Nonvitiated heated air, °F	Maximum exhaust temperature, °F
CE-5B-1	Sector	60 to 275	2 to 12	500 to 1,350	3,200
CE-5B-2	Flametube	60 to 400	0.6 to 5	500 to 1,350	3,200
CE-9B-A	Sector	120 to 450	5 to 30	750 to 1,100	3,400
CE-9B-B	Flametube	120 to 450	1 to 15	750 to 1,100	3,400
ASCR Leg 1	Sector	50 to 900	3 to 50	500 to 1,200	3,400
ASCR Leg 2	Flametube	50 to 900	1 to 10	500 to 1,200	3,400
ECRL-1B	Augmentors	5 to 150	5 to 60	100 to 625	1,900

Facility Testing Information

<http://facilities.grc.nasa.gov>

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ECRL control room.



Researchers and technicians making test modifications to the ASCR.