

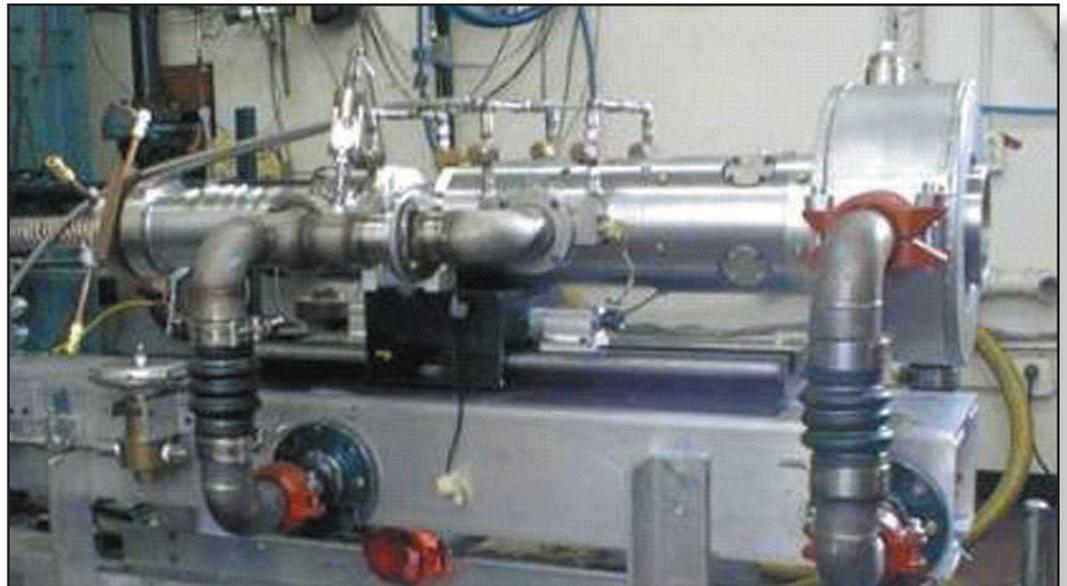


Air Force Research Laboratory | AFRL

Science and Technology for Tomorrow's Air and Space Force

Success Story

CRITICAL PULSED DETONATION ENGINE EXPERIMENT COMPLETED



Propulsion Directorate scientists completed in-house testing of a Boeing pulsed detonation engine (PDE) in the directorate's High Pressure Combustion Research Facility at Wright-Patterson Air Force Base, Ohio. The test results will provide a benchmark for performance and will be used for validating models and simulations over a wide range of conditions. These tests will also be used to guide future development of advanced propulsion systems considered by the Air Force.



Air Force Research Laboratory
Wright-Patterson AFB OH

Accomplishment

The tests evaluated PDE performance at higher pressure and temperature conditions. This critical PDE experiment validated the performance advantages predicted for PDEs at supersonic speeds over a much broader range of simulated altitudes, flight speeds, and compression ratios. At the same time, researchers also collected data to evaluate the use of pulse detonation combustion in a turbine/PDE hybrid cycle. During this testing, Mach 2.7 conditions were successfully reached for pure PDE operation, and Mach 1.8 conditions were reached for hybrid test cycles.

Background

The directorate's PDE team has been involved in experimentation and testing of PDE technology for several years in both internal PDE development programs and industry collaborative efforts. Originally developed by the Boeing Company with National Aeronautics and Space Administration funding, the engine was previously tested at the Boeing Phantom Works at low pressures and temperatures in order to study PDE acoustics and operability at altitude.

Propulsion
Emerging Technologies

Additional Information

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (04-PR-23)