



Impact

SBIR Topic Number:

AF02-298

Title:

Microsensors for Gaseous Emissions Analysis

Contract Number:

FA9101-04-C-0001

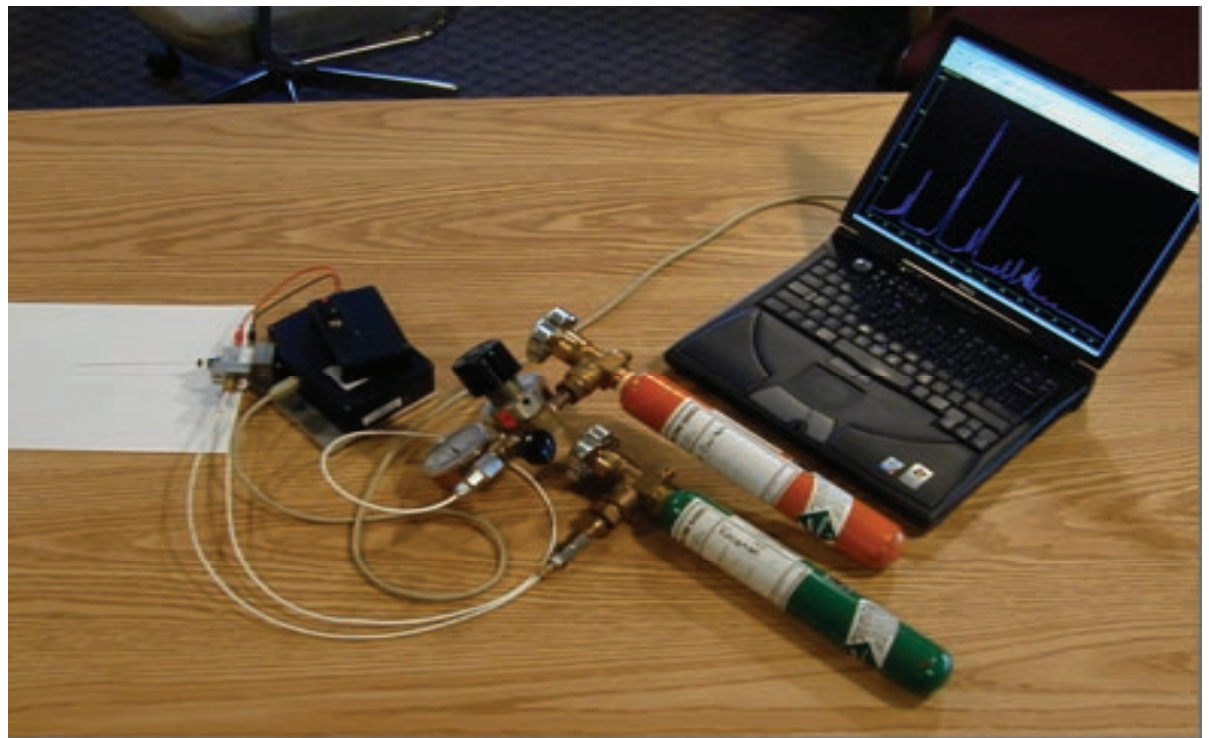
Company Name:

Caviton Corporation, Champaign, IL

Technical Project Office:

Arnold Engineering Development Center, Arnold AFB, TN

An example of Air Force supported SBIR technology that met topic requirements and is being commercialized by the small business partner.



New Sensor Measures Performance and Health of Jet Engines

- Besides monitoring engine emissions the broad range of potential applications include leak detection and environmental analysis applications
- Monitoring emissions from jet engines helps measure the health of the engine
- New sensor technology determines the chemical species present in jet engine exhaust

AEDC#2006-046

A

DISTRIBUTION A:
Approved for public
release; distribution
unlimited.

Air Force Requirements

The Air Force has a variety of requirements for monitoring and measuring gaseous species, including the monitoring of jet engine exhaust. Exhaust composition can indicate performance and health of the engine, as well as quantifying pollutants that may be generated by the engine. The Air Force requested a micro-sensor capable of monitoring jet exhaust in a rugged, reliable, compact package. Additionally, fast time response, trace level sensitivity, and simultaneous detection of compounds of interest were required.

SBIR Technology

Caviton has developed a novel sensor based on microdischarge technology. This microdischarge is stable in air (or other environments), and excites the chemicals that enter the discharge. The chemicals then emit light that is indicative of the gaseous components of the environment, and their relative concentrations. This light is then coupled to a spectrometer through an optical fiber. The spectrometer separates the light into a range of wavelengths, which are analyzed to determine the chemical species present. These detectors are compact, light weight and rugged, while providing real-time, continuous detection for a wide range of chemical species.

Company Impact

Caviton has benefited greatly from the SBIR project funded by the Air Force. The development provided through these contracts has led to new applications that were funded through the EPA, and Navy, and to subcontracts with Honeywell International on projects funded by DoE and DARPA. This development has been instrumental in moving this important technology closer to commercial applications, possible licensing agreements, and commercial products and has helped Caviton to develop an outstanding team of scientists and engineers, as well as leading to increased revenues and exposure.

Technology Payoff

The development of Caviton™ micro-sensors under SBIR Phase I and Phase II funding has allowed the identification of a broad range of applications. Leak detection, environmental analysis, and onboard jet emissions monitoring are potential Air Force uses. Additionally, this work has led to chemical warfare agent detection work for DARPA, and emissions monitoring work for the U. S. Environmental Protection Agency, and process control applications for the Department of Energy. These low-cost sensors will have a myriad of future applications where small-size, rugged design, and sensitive detection is required.



U.S. AIR FORCE

SBIR

Air Force SBIR Program
AFRL/XPTT
2275 D Street
Wright-Patterson AFB, OH
45433-7226

AF SBIR Program Manager: Steve Guilfoos
e-mail: stephen.guilfoos@wpafb.af.mil
Website: www.sbirstrmall.com

Comm: (800) 222-0336
Fax: (937) 255-2329
e-mail: afri.xptt.dl.sbir.hq@wpafb.af.mil

Air Force
Research Laboratory | AFRL
Science and Technology for Tomorrow's Air and Space Force