

SBIR Topic Number:
AF06-174

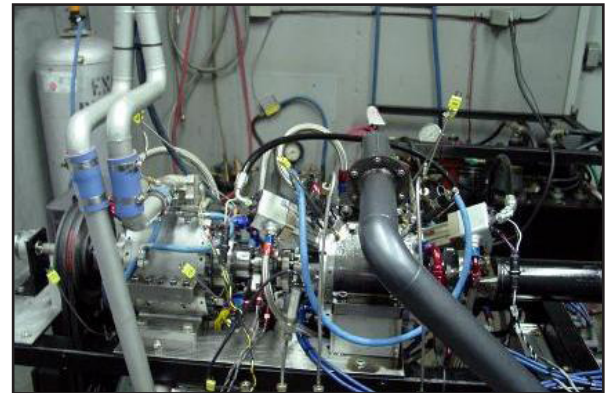
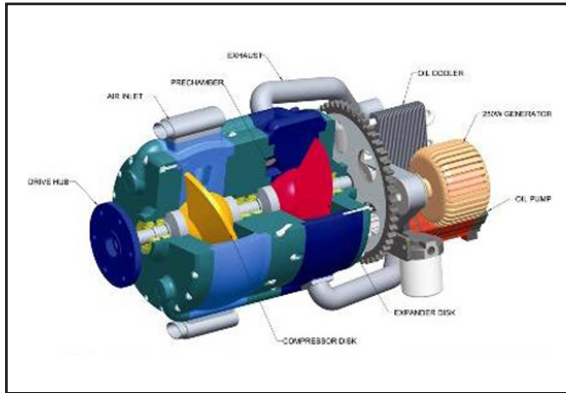
SBIR Title:
Power and
Aeropropulsion

Contract Number:
FA8650-07-C-2735

SBIR Company Name:
Kinetic BEI, LLC
South Elgin, IL

Technical Project Office:
AFRL Propulsion
Directorate, Wright-
Patterson AFB, OH

This Air Force SBIR/STTR Innovation Story is an example of Air Force supported SBIR/STTR technology that met topic requirements and has outstanding potential for Air Force and DoD.



Innovative Engine Technology Offers Significant Power Density Advantages

- The Air Force needs innovative approaches for developing small engines with improved affordability, performance, reliability, endurance, and fuel consumption characteristics
- Kinetic BEI, LLC, is finalizing development of a second-generation prototype for the Meyer Nutating Disk Engine, a new engine technology
- The Nutating Engine is twice as power dense as a conventional two-stroke engine and four times as power dense as a four-stroke piston engine
- Kinetic BEI won a prestigious Silver Award at the 2008 World's Best Technology Showcase in Arlington, Texas

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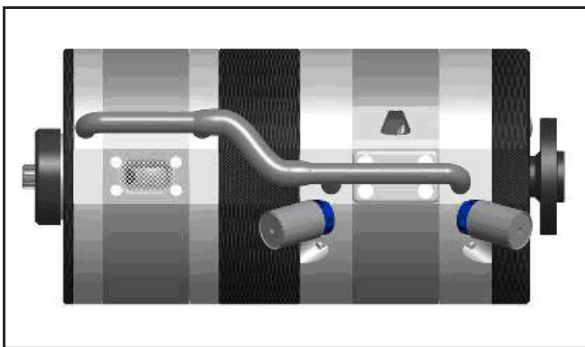
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Air Force Requirement

The Air Force needs innovative approaches for developing small (less than 200-pound thrust/horsepower) engines with improved affordability, performance, reliability, endurance, and fuel consumption characteristics.

SBIR Technology

In this SBIR project, Kinetic BEI, LLC, is finalizing development of a second-generation prototype for the Meyer Nutating Disk Engine, a new engine technology. Several key steps in the engine development process have been completed, including testing of an 80kW (150 Hp) demonstrator Nutating Compressor and Expander that work together as an engine.



Compared to other positive displacement engines, the Meyer Nutating Disk Engine offers significant power density advantages in both power-to-weight and power-to-size. While technically an internal combustion engine, the Meyer Engine features two disks that nutate (wobble) on individual Z-shaped power shafts. The motion of one disk produces a four-stroke cycle, and enables the displaced volumes to be used twice per engine revolution, making the engine twice as power dense as a conventional two-stroke engine and four times as power dense as a four-stroke piston engine.

The Nutating Engine features two sections: one that acts as an Expander, and one that acts as a Compressor. It also has the capability of changing compression ratios, and can operate on multiple fuels, including hydrogen, and in hybrid vehicle applications.

Potential Air Force Application

There are several potential military and commercial applications for this advanced engine technology. It offers advantages as a stand alone compressor or as an engine. The market for the Nutating Engine includes any application where an internal combustion engine is now used.

Prime military contractors are pursuing the use of the Meyer Nutating Disk Engine technology in unmanned aerial vehicle (UAV) applications. Other contractors have expressed interest in its prospective use as an advanced power source for tactical combat platforms or in compressor technology.

Company Impact

This SBIR project offered Kinetic BEI the opportunity to work on a state-of-the-art research project, providing the company with further recognition and potential marketing opportunities.

Many of the opportunities have been in the form of partnerships for new development programs with prime contractors. Others have shown interest in utilizing the technology for commercial markets.

Kinetic BEI was the recipient of a prestigious Silver Award at the 2008 World's Best Technology (WBT) Showcase in Arlington, Texas. The WBT Showcase is the nation's premiere event show using the largest collection of undiscovered technologies emanating from top universities, laboratories, and research institutions from across the country and around the globe.



SBIR/STTR

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