



Success Story

COMPOSITE BEARING CAGES SHOW GREAT PROMISE FOR ADVANCED TURBINE ENGINES



Engineers from the Propulsion Directorate and Allcomp, Inc. developed carbon-carbon (C-C) composite cages that demonstrate significant payoff in high-performance, marginally lubricated bearing applications. The most recent success involves their use in bearings, evaluated by Williams International (WI), for small aircraft turbine engines.



Air Force Research Laboratory
Wright-Patterson AFB OH

Accomplishment

WI recently conducted full-scale bearing tests using C-C composite cages under an independent research and development effort. C-C composite cages demonstrated significant performance advantages over cageless and steel-cage bearing designs in over 1,000 hours of accumulated test time.

Background

WI is considering the composite cages for small turbine engines such as the XTL-87 and WJ24-8 engines. Researchers transitioned composite cages into the Allison Advanced Development Company (AADC) XTL-16 Joint Expendable Turbine Engine Concept technology demonstrator engine and are planning to transition them into the AADC XTL-17 and AADC/General Electric Aircraft Engines (GEAE) XTC-77/1 demonstrator engines.

GEAE and Pratt & Whitney are considering the technology for large fighter class turbine engines such as the Integrated High Performance Turbine Engine Technology and the Versatile Affordable Advanced Turbine Engine demos. Hamilton-Sundstrand is also considering this technology for the Miniature Air Launched Decoy TJ30 production engine. Directorate engineers Drs. Nelson Forster and Lewis Rosado, along with Mr. Wei Shih, of Allcomp, Inc., jointly developed C-C cages (Patent No. 5,752,773, May 1998).

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. (03-PR-02)