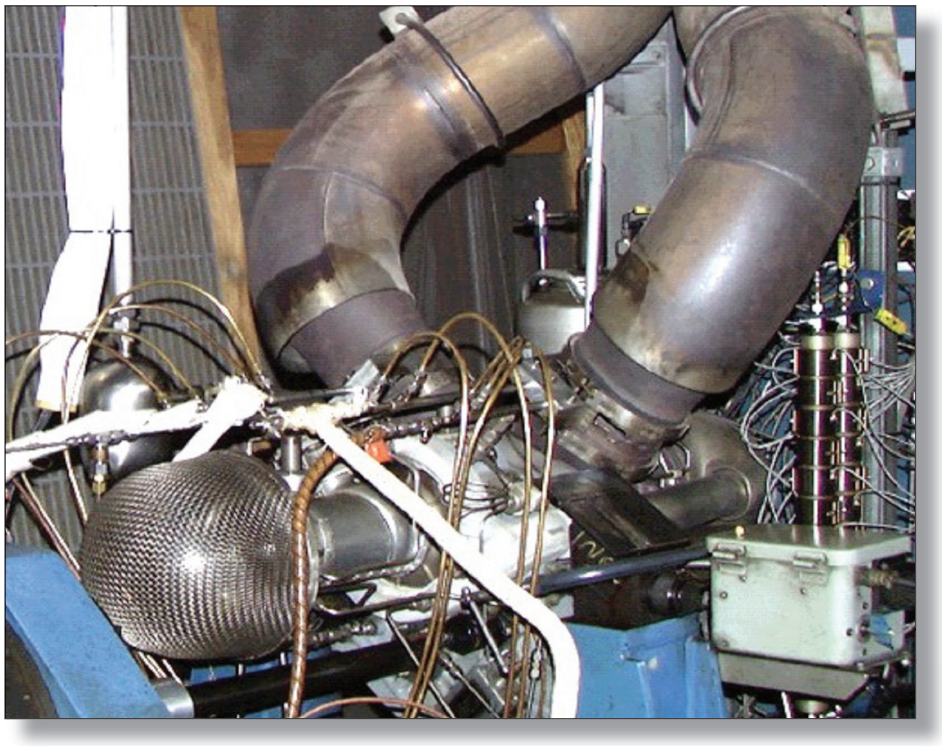
Air Force Research Laboratory|AFRL

*Science and Technology for Tomorrow's Air and Space Force*

## *Success Story*

# FIRST EVALUATION OF PARTICULATE MITIGATION ADDITIVES COMPLETED



The Propulsion Directorate recently completed the first evaluation of fuel additives to mitigate soot particulate emissions from turbine engines. The directorate's experimental detergent-type additive reduced particulate number density by 67%, resulting in a calculated particulate mass reduction of 53%.

Air Force Research Laboratory
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## Accomplishment

The Turbine Engine Division's Fuels Branch tested 17 additives originally designed to reduce emissions and/or improve combustion characteristics in internal combustion engines in a T63 helicopter engine. Directorate engineers analyzed engine particulate exhaust using a suite of state-of-the-art instrumentation to characterize particulate number density (number of particles per cubic centimeter), size distribution, mass, and particulate chemical composition.

## Background

Directorate experiments show that commercial additives and cetane improvers are ineffective in reducing particulate emissions or altering particle size distribution. However, researchers observed dramatic reductions in particulate emissions with one of the experimental proprietary additives. Further research into this and other additives of similar chemistry is ongoing to help explain the mechanisms by which the additive reduces particulate emissions in the T63.

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-05)