

Aeronautics

# External Aircraft Noise Reduction Liners

External acoustic liners for multifunctional aircraft noise  
reduction

NASA Langley Research Center, in collaboration with Boeing and Lockheed Martin, has developed a new external acoustic liner for aircraft noise reduction. While the acoustic liner can be placed on any external aircraft surface, one attractive application is for open rotor noise reduction. Airframe manufacturers are considering open rotor engines for future aircraft designs as they provide significant fuel savings. However, open rotor engines have no nacelle and, thus, do not allow the use of conventional nacelle liners for noise abatement. This technology strategically places acoustic liners on the external surface of the aircraft to reduce such engine noise.

## BENEFITS

- ➔ Has minimal impact on aircraft weight
- ➔ Has minimal impact on aerodynamic characteristics
- ➔ Allows for noise reduction in space-constrained areas
- ➔ Uses proven noise reduction designs
- ➔ Can be easily retrofitted in some areas of the aircraft

## APPLICATIONS

- ➔ Aircraft
- ➔ Wind Turbines
- ➔ Other noise abatement applications

technology solution

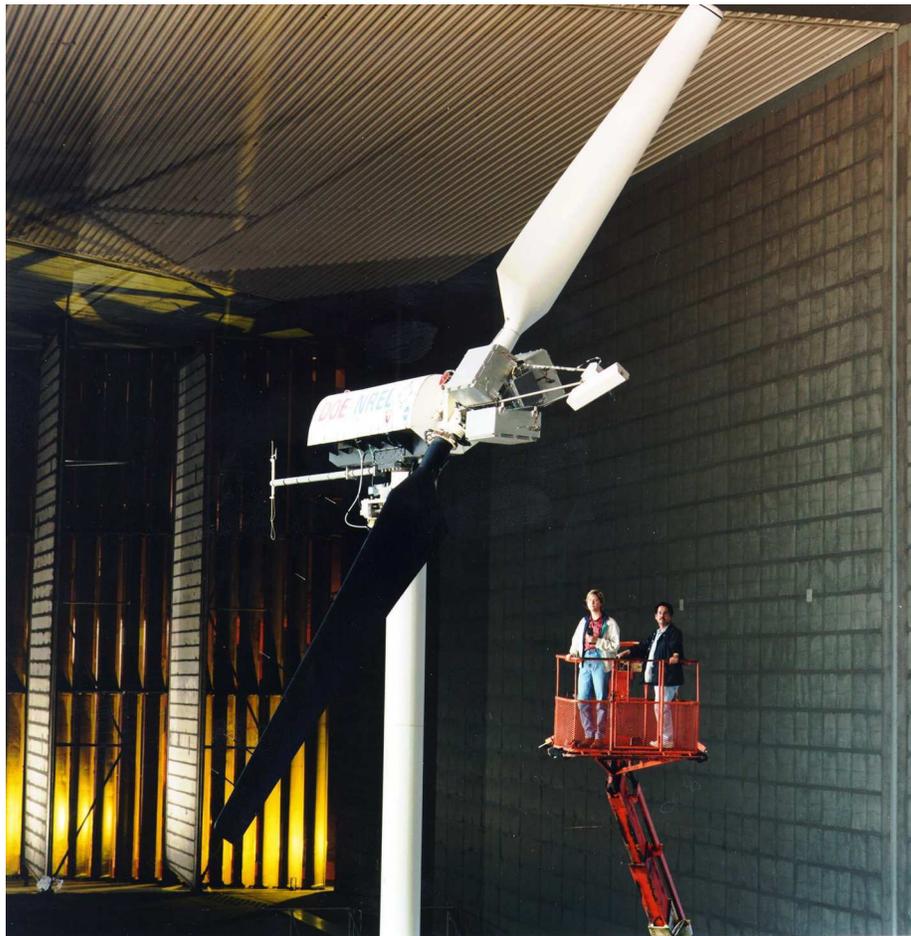


# NASA Technology Transfer Program

Bringing NASA Technology Down to Earth

## THE TECHNOLOGY

This technology is an evolution of acoustic liners developed for engine noise abatement that are typically located inside nacelles. The acoustic liners described here can be outfitted on external surfaces and in tight spaces. Three initial areas of the aircraft have been considered as part of an aircraft configuration incorporating an open rotor propulsion system. The three areas where the liner configurations were applied were (1) under the rotor, (2) on the upper surface of the elevon, and (3) on the surface of a strut.



Technology can be applied to wind turbines (image of NASA researchers testing a turbine in wind tunnel).

## PUBLICATIONS

Patent Pending



National Aeronautics and Space Administration

### The Technology Gateway

### Langley Research Center

Mail Stop 151  
Hampton, VA 23681  
757-864-1178  
LARC-DL-technologygateway@mail.nasa.gov

<http://technology.nasa.gov/>

[www.nasa.gov](http://www.nasa.gov)

NP-2015-07-1944-HQ

NASA's Technology Transfer Program pursues the widest possible applications of agency technology to benefit US citizens. Through partnerships and licensing agreements with industry, the program ensures that NASA's investments in pioneering research find secondary uses that benefit the economy, create jobs, and improve quality of life.

LAR-18024-1