



# Transition

**SBIR Topic**

**Number:**

AF01-124

**Title:**

Ice Phobic Materials

**Contract**

**Number:**

F33615-02-C-5606

**Company Name:**

Microphase Coatings  
Inc., Garner, NC

**Technical**

**Project Office:**

AFRL Materials &  
Manufacturing Directorate

**Transition Office:**

ASC/YSAF, 6-5328

An example of Air Force supported SBIR technology that has been transitioned into an Air Force or other DoD system or subsystem or used by Air Force test ranges and facilities or maintenance depots.



## New Coating Process Protects B-2 Engines From Ice Damage

- Over the past five years 30 B-2 engines experienced ice damage
- Estimated cost of ice problems with the B-2 cost \$750K annually
- SBIR coating technology works to dramatically reduce ice ingestion in B-2 engines
- Transfer of this technology to other aircraft is likely

**A**

DISTRIBUTION A:  
Approved for public  
release; distribution  
unlimited.

## Air Force Requirements

The Air Force needed a reliable and effective way to dramatically reduce or eliminate the problem of ingesting ice into aircraft engines. In certain climatic conditions, ice can form in engine inlets and leading edges. The ice can periodically break off and cause internal damage to the engine. The majority of these icing incidents occur on ground during pre-flight warm up. The B-2 System Program Office approached AFRL/ML in FY00 to see if a coating could be developed that would prevent ice from forming on the engine inlets.

## SBIR Technology

An SBIR Phase II project is currently in the process of testing a new coating developed to prevent ice formation. The coating was designed to withstand the harsh environment in which a B-2 operates. Therefore the coating had to include a range of capabilities including durability, flexibility, and survivability operating in extreme thermal environments. The coating lowers the melting point of water in contact with the surface.



## Air Force Transition Payoff

The technology is currently undergoing final testing under the demanding conditions under which a B-2 aircraft operates. This technology has the capability of dramatically reducing ice damage to B-2 engines. Engineers are optimistic that the coating will perform adequately. Over five years, more than 30 B-2 engines experienced damage due to ice build up. This problem is estimated to cost the B-2 \$750K annually as well as impacting aircraft availability. Plans have already been considered to transfer the technology to other aircraft that present less demanding flight environment profiles.



U.S. AIR FORCE

# SBIR

AF SBIR Program Manager  
AFRL/XPTT  
1864 4th Street  
Wright-Patterson AFB, OH 45433

AF SBIR Program Manager: Steve Guilfoos  
e-mail: [stephen.guilfoos@wpafb.af.mil](mailto:stephen.guilfoos@wpafb.af.mil)  
Website: [www.sbirstrmall.com](http://www.sbirstrmall.com)

DSN Fax: 785-2329  
T: (800) 222-0336  
F: (937) 255-2329

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