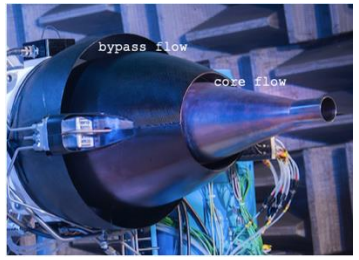
Design and Manufacturing of High-Temperature Acoustic Liner for Aircraft Engines

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Problem

Graded Micro-Porous Acoustic Liner

ARIS Inc. offers design and manufacturing of lightweight acoustic liner to reduce exhaust and core noise in extreme high-temperature environments (up to 1000°C), offering both broadband and tonal noise reduction. The proof of concept was tested on exhaust section of NASA's DGEN 380 engine.

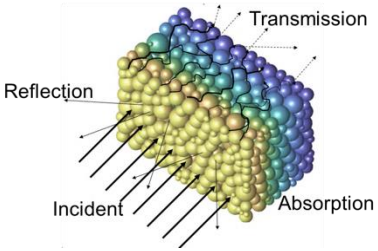


Challenge

Aircraft engine exhausts produce high broadband and noticeable tonal noise at extreme temperatures (500 – 1000°C). No acoustic material exists to solve this problem.

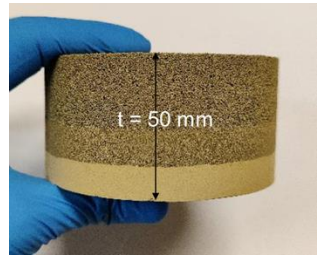
Solution Specifics

- Ceramic-based micro-porous liner with graded particle structure and inorganic binder, designed for both broadband and tonal noise reduction at temperatures up to 1000°C.
- Successfully tested on NASA's DGEN 380 engine at 700°C with no material degradation, demonstrating durability and acoustic performance.



Unique Selling Proposition

- First-ever high-temp acoustic liner combining thermal resistance and 3D flow-based broadband and tonal noise control where no existing material functions.



Impact and Technical Approach

Technology Readiness Level (TRL): 4 - 6

Manufacturing Readiness Level (MRL): 3 - 4



What is the Impact of your Solution?

- A systematic design and manufacturing of lightweight high-temperature microporous acoustic liners that mitigates both broadband and tonal noises.
- Scalable, adaptable and durable ceramic technology to any a/c engine exhaust.

What is the Technical Approach?

- Graded ceramic microspheres, surface coated with inorganic binders were press-molded into a porous structure. Tested on DGEN 380 exhaust at 700°C, confirming acoustic and thermal performance.

Performance

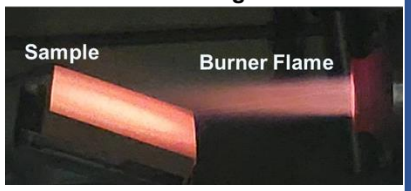
End-user payoff:

- First acoustic liner tested and proven for both broadband and tonal noise reduction and high-temperature (700–1000°C) durability.
- Improves safety and comfort for next-gen tactical aircraft and drones in hot conditions.

Dual-Use applications:

- Military jet engine exhaust and core sections
- Industrial turbines and powerplants
- High-temp furnace or reactor enclosures

Burner Rig Test



High-Temperature Acoustic Liner

Before



After

