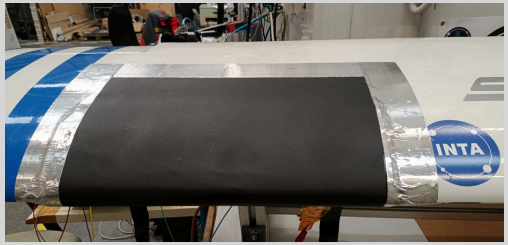
# ADAPTABLE ELECTROTHERMAL ICE PROTECTION SYSTEM

**Efficient and flexible anti-icing protection, designed to adapt to any aircraft surface, minimizing weight and allowing for easy integration**

**Researchers from the Department of Materials and Structures have developed a electrothermal system capable of removing ice more efficiently.**




Ice accretion on aircraft surfaces represents one of the most significant operational hazards in aviation, as it affects aerodynamics, increases energy consumption, and compromises flight safety. Current solutions, mostly based on rigid structures or systems integrated during manufacturing, have limitations in terms of adaptability, weight, and ease of integration into existing aircraft. This growing need for lighter, more efficient, and versatile systems drives the development of advanced thermal protection technologies.

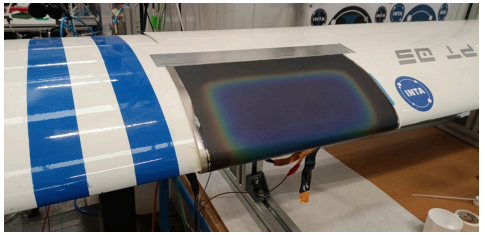
The development carried out at INTA offers an advanced solution for anti-icing protection, enhancing both safety and efficiency in aircraft exposed to icing conditions. The technology is based on a flexible multilayer structure capable of generating and uniformly distributing heat, ensuring efficient de-icing across the entire surface, while simultaneously reducing the high energy demands of current systems, which require oversized engines to supply additional heat. Enhanced thermal efficiency would enable the use of smaller engines and improve overall aircraft performance even outside the operation of the anti-icing system.

## MARKET NEED

The multilayer system provides an innovative response to the need for combining flexibility, thermal uniformity, and low profile, facilitating its adoption across multiple aerospace platforms.

## ADVANTAGES

- High flexibility and adaptability, allowing easy conformation to complex surfaces.
- Low thermal inertia, enabling rapid system activation and deactivation.
- Uniform heating, even under forced convection conditions.
- Very low profile, minimizing weight and space requirements.



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## STAGE OF DEVELOPMENT

- Technology protected by a patent application
- TRL 5