FIBER OPTIC BASED ICE SENSOR

Instant detection of the presence of ice using fiber optics.

VÍDEOS

MARKET NEED

- **Instant detection of ice** on any area of a surface.
- Identification of **different types of ice.**
- Provides solutions for **sectors with instant ice detection needs**, such as aerospace, wind energy, critical infrastructures, and refrigeration systems.

The Composite Materials Area of the Spanish National Institute of Aerospace Technology (INTA) has developed a fiber optic sensor that instantly identifies the presence of ice on the surface of a body, being able to distinguish different types of ice.

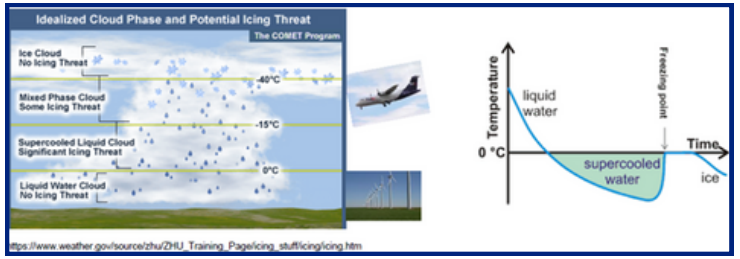
The presence of clouds of supercooled water in the trajectory of aircraft generates the sudden growth of ice on their wings, which modifies their aerodynamics and the consequent loss of lift. This has been the common reason for some of the latest aviation accidents.
On the other hand, wind turbines subjected to similar situations tend to accumulate ice on their blades, which leads to an imbalance of the wind turbine, which must be braked as a precaution until the ice is removed, with the consequent production losses.

The present technology **instantly detects the presence of ice,** allowing for an alert to be issued to manage the situation, and potentially activating an anti-ice system (see other INTA technologies). All of this is achieved with a sensor embedded in the material that **does not alter the aerodynamics of the structure.**

The system, in its simplest configuration, is based on a pair of fiber optic sensors, such as Bragg gratings (FBGS) or long period gratings (LPG), with certain characteristics and placed in certain areas of the body. This technology is even capable of differentiating different types of ice, which are related to different degrees of danger.
Due to fiber optics' characteristics, different sensors can be inserted in a single fiber, leding to the coverage of large surfaces of a body with a single fiber, with the ability to differentiate the response of each sensor and, therefore, to **locate the presence of ice accurately.**

ADVANTAGES

- A single fiber is capable of incorporating a large number of sensors, covering extensive surfaces.
- Economic system free from electromagnetic interference.



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STAGE OF DEVELOPEMENT

- **Patented** technology. **Validated and demonstrated** in flight.
- Seeking **collaboration** to increase TRL and subsequent **transfer.**