

Producing resistive tracks for electrothermal ice protection system on aircraft wings, with an all fiber ultra-short pulses Laser, mounted on a mobile micro-machining platform

Multitel is a research and innovation center, located in Mons, Belgium, that offers services to companies and develops new technological concepts in the following fields:

- ✓ IoT & Embedded systems
- ✓ Network engineering
- ✓ Applied photonics
- ✓ Artificial Intelligence
- ✓ Railway certification

One of the assets of Multitel is its multidisciplinary and complementary skills of its about seventy employees that stimulate the innovation in Wallonia and worldwide.

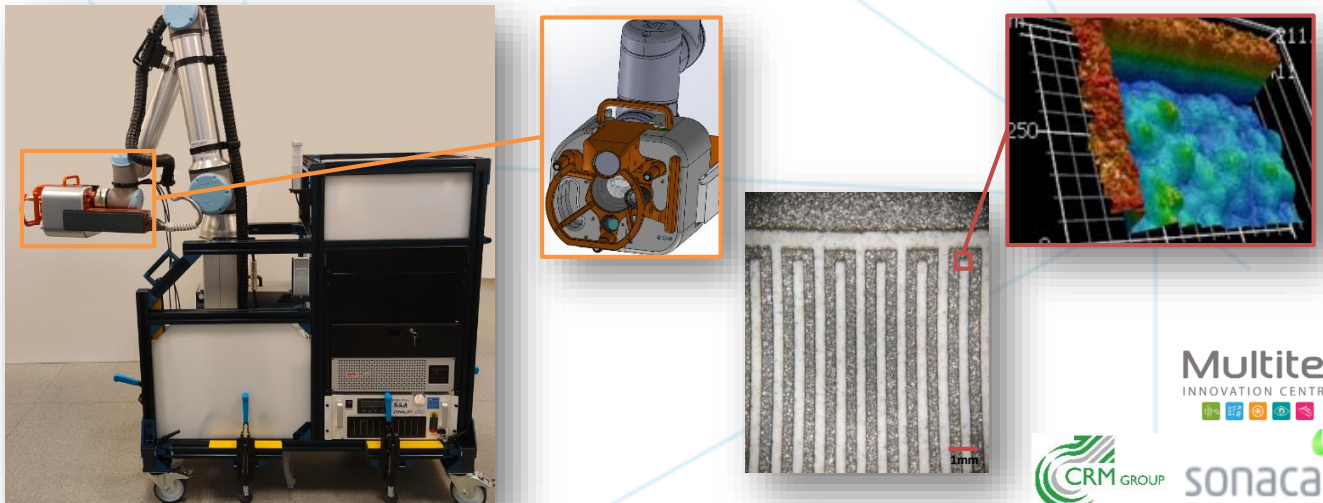
Multitel is involved in the WINGS project (**Walloon INnovations for Green Skies**), more specifically through its "Applied Photonics" department dealing with light engineering, in the following areas of research: fiber Lasers, optical sensors, bio-photonics, laser micro-machining, and Terahertz spectroscopy.

In particular, in WP 1.3.1, Multitel's research engineers and their partners (Sonaca, CRM 3D printing electronic group) have developed a subtractive process by laser ablation for producing resistive tracks for electrothermal ice protection system.

The use of an "ultra-short" pulsed laser makes it possible to remove few microns of material very precisely and without damaging the surroundings by thermal heating and degrading the support. Thus, this type of Laser micro-machining allows to draw outlines and remove partially a metallic resistive track such as Nickel or other, deposited on a dielectric or a flexible polymer.

This laboratory process is currently being transposed to an "in-situ" mobile demonstrator, based on a 6-axis Cobot. It traces the outlines of the resistive tracks by Laser on large 3D objects such as structures used at the leading edges of aircraft wings.

The cobot arm is equipped with a custom all fiber picosecond laser (infrared 1030nm, >10W, pulses 10ps 10μ) and a laser process head which embeds a galvanometer scanner and sensors.



These state-of-the-art developments could find many other applications apart from those targeted by aeronautics industry, and offer the research center the means to produce high-tech demonstrators with high industrial development potential.

For more information, please visit www.wingspartnership.be

www.multitel.eu/expertise/applied-photonics/

www.skywin.be/en/wallonia-aero