MAJoR

Maintenance, Joining, and Repair innovation in multidomain defence

Cascade Funding Call# 1 Awardee

MJR1-110

Project Acronym: L_UAV

Project Title: Controlled Polymer Ablation of Light Unmanned Air Vehicle Components.

Abstract

The L_UAV project investigated the feasibility of using Controlled Polymer Ablation (CPA) for ultra-light composite components used in unmanned aerial vehicles (UAVs). As advanced polymer matrix composites are increasingly used to achieve high strength-to-weight ratios, the reliability of adhesive joints becomes critical to overall structural integrity. Conventional surface preparation methods can introduce inconsistencies or damage, particularly in thin, lightweight laminates, necessitating more precise and repeatable approaches.

The plasma-based ablation process used in the project selectively removed the surface matrix without damaging the underlying fibres. This therefore, increases surface energy and promotes improved adhesion. The CPA process also improves the reliability of the joints as the process uses a robotic arm to apply the plasma, removing human error. Coupon testing will be done to systematically evaluate the effects of the plasma treatment. Following this, further substrate testing will be done on a drone component. Finally, a wing section demonstrator will be manufactured using the CPA process for bonding.

The project aims to develop a controlled, repeatable plasma ablation methodology for surface preparation that enhances adhesive bonding while preserving the integrity of ultra-light composite materials. The outcomes are expected to support improved manufacturing and repair strategies for next-generation UAV airframes, contributing to increased reliability and structural efficiency.

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Company description

ÉireComposites Teo is an innovative company specialising in the manufacture and testing of lightweight, high-performance fibre-reinforced composite materials. It serves a global portfolio of over 70 blue-chip customers across the aerospace and renewable energy sectors. The company holds AS9100 and NADCAP accreditations, along with multiple customer approvals, and has developed substantial intellectual property in composite manufacturing and tooling.

As a well-established supplier to the aviation, space, and renewable energy industries, ÉireComposites Teo has a strong track record in securing research funding. This includes support from Irish programmes such as DTIF and SEAI, as well as the EU's Horizon Europe programme, particularly in areas such as material innovation, circularity, mobility, and sustainability.

Key facts

Company	ÉireComposites Teo
Country	Ireland
Topic	Hybrid Structures for Defence Platforms: Multi-Material Design, Joining & Reversible Interfaces
Start date	01/09/2026
End date	28/02/2027
Budget/ Grant	EUR 60,000

Contact

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