

PROJECT

GRAPHICING

Application of graphene based materials in aeronautical structures for de-icing, lightning strike protection, fire barrier and water absorption prevention purposes

Funding: European (Horizon 2020)

Duration: Jul 2020 - Feb 2023

Status: Ongoing

Total project cost: €546,843

EU contribution: €500,000



[CORDIS RCN : 228385](#)

Objectives:

In order to improve aircraft efficiency and to decrease fuel consumption and CO2 emissions, innovative light weight polymer composite materials with superior mechanical properties for advanced aircraft structures are in development.

As an ultimate goal such new lightweight materials should also enable advanced integration of additional functionalities. Current functional aircraft components are designed separately and integrated afterwards. A future advanced integrative manufacturing approach is leading to fewer but also more complex parts with multiple functions resulting in better energy management, aerodynamic efficiency and additional weight reduction.

A candidate for the development of advanced functional lightweight materials and systems with the capability for efficient integration in aircraft structures are thermoelectric de-icing systems essential for aircraft safety by avoiding in-flight icing. State-of-the-art systems consist of metal or composite structural aircraft components coated with polymers containing a high amount of graphite and carbon black particles in order to enable sufficient electrical conductivity required for efficient de-icing applications. The high amount of non-polymer particles deteriorates the advantageous mechanical properties of high strength polymers making such systems unsuitable for an integrative approach.

In order to realise a future integrative approach structural components can be modified by graphene additives in order to improve electrical and thermal conductivity, toughness/damage tolerance and the formation of an efficient vapor/liquid barrier. It is therefore promising to investigate and develop graphene materials based composites for their potential use in thermoelectrical de-icing, lightning strike protection, fire and water barrier systems with the ultimate goal of reaching higher integrated components. Depending on modification and structure of graphene material there is a potential to enhance mechanical properties.

Parent Programmes:

[H2020-EU.3.4. - Horizon 2020: Smart, Green and Integrated Transport](#)

Institute type: Public institution

Institute name: European Commission

Funding type: Public (EU)

Other programmes: JTI-CS2-2019-CFP10-AIR-02-78 Application of graphene based materials in aeronautical structures for de-icing, lightning strike protection, fire barrier and water absorption prevention purposes

Lead Organisation:

Cest Kompetenzzentrum Fur Elektrochemische Oberflächentechnologie Gmbh

Address:

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EU Contribution: €242,950

Partner Organisations:

Villinger Gmbh

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EU Contribution: €109,300

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Organisation Website:

<http://www.vzlu.cz>

EU Contribution: €147,750

Technologies:

Composite materials
Composite materials for structural purposes in the aircraft

Development phase: Research/Invention

Aircraft design and manufacturing
Multifunctional layer with ice/fire protection and health monitoring

Development phase: Research/Invention

STRIA Roadmaps: Vehicle design and manufacturing

Transport mode: Air transport

Transport sectors: Passenger transport, Freight transport

Transport policies: Other specified

Geo-spatial type: Other