

Titanium COmposite Adhesive JOints

Fact Sheet

Project Information

TICOAJO

Grant agreement ID: 737785

[Project website](#) 

DOI

[10.3030/737785](https://doi.org/10.3030/737785) 

Project closed

EC signature date

17 January 2017

Start date

1 February 2017

End date

31 October 2019

Funded under

SOCIETAL CHALLENGES - Smart, Green And Integrated Transport

Total cost

€ 694 125,00

EU contribution

€ 694 125,00

Coordinated by

STICHTING KONINKLIJK
NEDERLANDS LUCHT - EN
RUIMTEVAARTCENTRUM
 Netherlands

Objective

Future aircraft will have to be more fuel efficient in order to accomplish sustainable air transport growth. One of the key enablers to achieve this fuel efficiency is drag reduction by improved aerodynamic efficiency. On its turn, a key enabler within this aerodynamic efficiency is air foil drag reduction by laminar flow control. The relevant technologies involve a hybrid joining of titanium and CFRP for the leading edge design. For a successful implementation of this concept the fracture properties (i.e. strain energy release rates) of this joint must be reliably determined experimentally to pave the way towards more precise numerical tools development for the critical design of such joints. A full experimental characterization of the mode I, II and mixed

mode fracture properties of three different joining technologies under quasi-static, fatigue and high strain rate loading in ambient, hot/wet and low-temperature conditions is thus required and targeted in this project.

The objectives set and the activities envisaged in TICOAJ0 are summarized as follows:

- Investigate manufacturing parameters to improve properties, focus on pre-treatment of metal and composite parts
- Preselect four different joining technologies already verified in industrial level
- Manufacture coupons with optimal adhesion characteristics for four union types
- Explore joint properties by static testing for all four union types at three environmental conditions (CTD, Ambient, HTW). At high strain rate perform tests at ambient conditions, for the best union type only
- Screen for the best union-type and characterize fatigue properties at three environmental conditions (cold-dry, Ambient, hot-wet), resulting in in-depth knowledge of the damage tolerance (DT) capabilities
- Validate the coupon results and in-depth DT-knowledge by manufacture two subcomponents, using the best manufacturing technique, predict its damage tolerance capabilities, test it in realistic (ambient) loading conditions, and correlate prediction and result. Perform a static test.

Fields of science (EuroSciVoc)

[engineering and technology](#) > [mechanical engineering](#) > [manufacturing engineering](#)

[natural sciences](#) > [chemical sciences](#) > [inorganic chemistry](#) > [transition metals](#)

[engineering and technology](#) > [mechanical engineering](#) > [vehicle engineering](#) > [aerospace engineering](#) > [aircraft](#)

[engineering and technology](#) > [materials engineering](#) > [composites](#) > [carbon fibers](#)

[engineering and technology](#) > [environmental engineering](#) > [energy and fuels](#)



Programme(s)

[H2020-EU.3.4. - SOCIETAL CHALLENGES - Smart, Green And Integrated Transport](#)

MAIN PROGRAMME

[H2020-EU.3.4.5.1. - IADP Large Passenger Aircraft](#)

Topic(s)

Call for proposal

[H2020-CS2-CFP03-2016-01](#) 

[See other projects for this call](#)

Funding Scheme

[CS2-RIA - Research and Innovation action](#)

Coordinator



STICHTING KONINKLIJK NEDERLANDS LUCHT - EN RUIMTEVAARTCENTRUM

Net EU contribution

€ 278 750,00

Total cost

€ 278 750,00

Address

**ANTHONY FOKKERWEG 2
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 **Netherlands** 

Activity type

Research Organisations

Links

[Contact the organisation](#)  [Website](#) 

[Participation in EU R&I programmes](#) 

[HORIZON collaboration network](#) 

Participants (2)



TECHNISCHE UNIVERSITEIT DELFT

 Netherlands

Net EU contribution

€ 221 875,00

Address

STEVINWEG 1

2628 CN Delft 

Activity type

Higher or Secondary Education Establishments

Links

[Contact the organisation](#)  [Website](#) 

[Participation in EU R&I programmes](#) 

[HORIZON collaboration network](#) 

Total cost

€ 221 875,00



PANEPISTIMIO PATRON

 Greece

Net EU contribution

€ 193 500,00

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265 04 Rio Patras 

Region

Κεντρική Ελλάδα > Δυτική Ελλάδα > Αχαΐα

Activity type

Higher or Secondary Education Establishments

Links

[Contact the organisation](#)  [Website](#) 

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Total cost

€ 193 500,00

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European Union, 2025

