

PROJECT

MOTIVE

Multi-physics mOdelling of high Temperature engine ValvEs

Funding: European (Horizon 2020)

Duration: Mar 2018 - Feb 2022

Status: Ongoing

Total project cost: €1,099,913

EU contribution: €919,809



Call for proposal: H2020-CS2-CFP06-2017-01

[CORDIS RCN : 213820](#)

Objectives:

Aim: Predictive assessment of the functionality, performance and controllability of pneumatic aircraft engine valves through modelling of elementary physical phenomena encountered in the engine environment.

Achievement of this project aim will be accomplished via two major technical objectives:

1. Successful completion of an experimental testing campaign involving materials characterisation, bespoke friction and aerodynamic testing;
2. Development of a multi-physics model capable of describing the thermal physics, mechanical physics and fluid dynamics which are the three key physical domains involved in a high-temperature engine valve environment. The multi-physics models will be calibrated and validated against the experimental data.

The project falls under the CS2 Large Passenger Aircraft IADP Platform 1 and addresses the work package WP1.5.3 "Applied Technologies for Enhanced Aircraft Performance". One of the main objectives is to provide the environment to create, establish, mature and calibrate tools and numerical simulation means to facilitate the transfer of results into scenarios different to the test or demonstration cases, and to facilitate "virtual" testing in addition to the designs and physical setups tested on ground and in flight. In addition, the IADP workspace places strong emphasis on developing a systematic understanding for dynamically-scaled demonstration, namely the physical laws, the range and limits of validity, accuracy and representativeness. With these in mind, the MOTIVE project is strongly aligned with the objectives of the CS2 programme.

The immediate impact of the project will be providing the IADP's Partners and aerospace community with a totally unique new set of multi-physics models, experimental data and numerical insight to utilise and adopt a multi-physics modelling framework to optimise pneumatic valve design. This will cut lead times and design-to-production through a faster pneumatic component prototyping and validation.

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-CS2-2017-CFP06-LPA-01-33 Multi-physics modelling of elementary physical phenomena applied to an innovative high temperature engine valve

Lead Organisation:

Twì Limited

Address:

Granta Park Great Abington
Cambridge
CB1 6AL
United Kingdom

EU Contribution: €499,566

Partner Organisations:

Scitek Consultants Limited

Address:

Burton Road 157
Derby
DE23 6AB
United Kingdom

EU Contribution: €208,653

Mecas Esi Sro

Address:

Brojova 2113/16
32600 Plzen
Czech Republic

EU Contribution: €48,991

Ventil Test Equipment Bv

Address:

POLAKWEG 6
2288 GE RIJSWIJK
Netherlands

EU Contribution: €162,599

Technologies:

Aircraft propulsion
Aircraft engine conceptual design tools

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