

PROJECT

PHP2

Pulsating Heat Pipes for Hybrid Propulsion systems

Funding: European (Horizon 2020)

Duration: Nov 2018 - Oct 2022

Status: Ongoing

Total project cost: €1,486,755

EU contribution: €1,486,755



Call for proposal: H2020-CS2-CFP07-2017-02

[CORDIS RCN : 218517](#)

Objectives:

As part of H2020 program, Clean Sky 2, the present topic is associated within WP1.6 “Demonstration of Radical Aircraft Configurations” and more specifically subWP1.6.2 “Hybrid Power Bench Development and Testing”. It aims at using Pulsating Heat Pipes (PHP) to exchange large amounts of energy for the cooling of different elements.

The solution proposed here is to develop a very detailed 1D simulation code for the development of new PHP designs:

1. fabricate them with innovative manufacturing techniques and extensively test them experimentally
2. as a “proof-of-concept” of this new disruptive cooling technology. Experimental data is used to validate the 1D code and develop a reduced model
3. that can be run in a short time (< 1s) to choose/select the most appropriate one for the application at hand.

This approach will make PHP commercially viable by cutting the time for their choice, sale and cost whilst eliminating all (or most) of the final testing by the end client.

Methodology:

Technical challenges are numerous due to an incomplete understanding of PHP in the literature: the lack of good design theories and of viable, comprehensive simulation tools to describe the thermal/hydraulic performance of a PHP. Furthermore, PHP are a new disruptive cooling technology that need to gain their acceptance into engineering practice...hence the partners need to carefully and thoroughly develop a very convincing case for their acceptance.

The present proposal, called P(HP)2 project, offers cooperation between JJ Cooling Innovation and Provides, leaders in modelling, design and fabrication of high-performance micro-two-phase cooling systems, and Altran, world-leader in Engineering Solutions and outsourced R&D, through their Expertise Centres “Fluids and Thermal Engineering” and “Scientific Computing Methods and Tools”.

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-CfP07-LPA-01-43 Pulsating Heat Pipe (PHP) modelisation & characterisation

Lead Organisation:

Altran Technologies

Address:

Boulevard Gouvion St Cyr 58
75017 Paris
France

EU Contribution: €585,745

Partner Organisations:**Provides Metalmeccanica Srl****Address:**

VIA PIAVE 82
04100 LATINA
Italy

EU Contribution: €426,485

Jj Cooling Innovation Sarl**Address:**

CHEMIN DES SAUGES 9
1018 LAUSANNE
Switzerland

EU Contribution: €474,525

Technologies:

Aircraft design and manufacturing
Energy management model

Development phase: Validation

STRIA Roadmaps: Transport electrification, Vehicle design and manufacturing

Transport mode: Air transport

Transport sectors: Passenger transport, Freight transport

Transport policies: Other specified

Geo-spatial type: Other