

PROJECT

AlIOxITD

Development and Manufacturing of an All-Oxide Inter Turbine Duct for Aeroengines

Funding: European (Horizon 2020)

Duration: Dec 2015 - May 2020

Status: Complete

Total project cost: €3,489,853

EU contribution: €3,072,595



Call for proposal: H2020-CS2-CFP01-2014-01

[CORDIS RCN : 199449](#)

Objectives:

The objective of the proposal is the development of an all-oxide Ceramic Matrix Composites (CMC) inter turbine duct for testing of the component in a demonstrator engine.

The development steps include:

- Designing the parts including the attachment to the metallic support structure
- Defining design rules how to work with oxide CMCs for engine parts
- Simulation of the parts behaviour under engine loads
- Assessment of the lifetime and reliability of the material in operation to translate the specimen behaviour onto the component level
- Optimizing the performance of the parts w.r.t. manufacturing parameters e.g. fibre orientation
- Characterizing the material properties needed for the design process on specimen level. This includes the material development for example to improve the matrix system for prepreg technology
- Manufacturing of the demonstrator parts
- Develop a concept for fining qualification steps
- Develop a concept for non-destructive testing
- Validating simulation results with engine data resulting from engine tests

For manufacturing oxide CMCs specimen and parts the following manufacturing techniques are included in the proposed project:

- Winding
- Prepreg technology (as automated as possible)
- Braiding

The path to final manufacture and validation will be documented and coordinated in close collaboration with the consortium partners and the topic manager.

This proposal answers the CfP in “Work Package 4 – Advanced Geared Engine Configuration (HPC-LPT)” of the Engine Integrated Technology Demonstrators in Clean Sky 2. It utilizes the low specific weight of oxide CMCs to save weight and its inherent oxidation and temperature resistant nature to save cooling air. It therefore, contributes to the key objectives of the work package: improvement of efficiencies and innovative lightweight and temperature resistant materials.

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)

Lead Organisation:

Deutsches Zentrum Fr Luft Und Raumfahrt E.v**Address:**

Linder Hoehe
51147 KOELN
Germany

Organisation Website:

<http://www.dlr.de>

EU Contribution: €1,865,095

Partner Organisations:**Schunk Kohlenstoff-Technik Gmbh****Address:**

RODHEIMER STRASSE 59
35452 Heuchelheim
Germany

Organisation Website:

<http://www.schunk-group.com>

EU Contribution: €700,000

Rheinisch-Westfaelische Technische Hochschule Aachen**Address:**

Templergraben
52062 Aachen
Germany

Organisation Website:

<http://www.rwth-aachen.de>

EU Contribution: €507,500

Technologies:

Manufacturing processes
Ceramic matrix composites

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