

PROJECT

IMCoLoR

Injection Moulding with Continuous Local Reinforcements

Funding: European (Horizon 2020)

Duration: Feb 2017 - Jul 2020

Status: Complete

Total project cost: €586,239

EU contribution: €503,375



Call for proposal: H2020-CS2-CFP03-2016-01

[CORDIS RCN : 208052](#)

Objectives:

In the IMCoLoR project the scroll of an air cycle machine is manufactured with an injection moulding process with the local integration of continuous carbon fibre reinforcements. The local reinforcements are placed along the main load paths in order to lead to a higher pressure and temperature resistance of the scroll than for a short carbon fibre reinforced scroll as manufactured in CleanSky I. Consequently, with this method also new generation aluminium scrolls can be replaced by a thermoplastic scroll reducing weight and cost and preventing the need of hazardous surface treatments.

Methodology:

For the local reinforcement of the injection moulded scroll a two-step process will be developed. In a first step, a 3D reinforcement structure from aligned pre-impregnated continuous carbon fibres (Tape) will be manufactured with the AFPT process. A removable core system will be implemented as a tool for the lay-up process. This allows the load adapted design of the reinforcements. In a second step, the reinforcement structure will be fixed inside an injection mould and will be over injected by injection moulding. The aim of the tool design is to enable a complete enclosure of the reinforcement structure. Therefore, the fixation system is embedded into the injection mould and consists of movable fixation elements that can fix and release the reinforcement structure. When the fixations are released they move backwards and are completely embedded in the mold. This enables the complete enclosure of the reinforcement inside the part without the build up of gaps. The exact position of the reinforcement can be adjusted with the fixations.

Non-destructive and destructive test methods will be implemented in order to evaluate the processing quality and the mechanical performance of the part.

A demonstrator will be manufactured with the developed technology and a final evaluation of the process in terms of an industrialization of the process will be done.

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:

Technische Universitaet Muenchen

Address:

Arcisstrasse 21
80333 MUENCHEN
Germany

Organisation Website:

<http://www.tu-muenchen.de>

EU Contribution: €251,775

Partner Organisations:**Appex Product Development, Prototypes, Parts GmbH****Address:**

STUTTGARTER STR. 7
80807 MUNCHEN
Germany

EU Contribution: €158,988

Fischer Advanced Composite Components Ag**Address:**

Fischerstr. 9
192 RIED / INNKREIS
Austria

Organisation Website:

<http://www.facc.co.at>

EU Contribution: €37,363

Stichting Thermoplastic Compositesresearch Center**Address:**

PALATIJN 15
7521 ENSCHEDE
Netherlands

EU Contribution: €55,250

Technologies:

Composite materials

Composite materials for structural purposes in the aircraft

Development phase: Demonstration/prototyping/Pilot Production

STRIA Roadmaps: Vehicle design and manufacturing

Transport mode: Air transport

Transport sectors: Passenger transport, Freight transport

Transport policies: Environmental/Emissions aspects

Geo-spatial type: Other