

Development of Aero Engine Component Manufacture using Laser Additive Manufacturing



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Project

The concept of the MERLIN project is to reduce the environmental impact of air transport using Additive Manufacturing (AM) techniques in the manufacture of civil aero engines.

Currently buy to fly ratios result in massive amounts of waste. Furthermore toxic chemicals and expensive tools are required during the manufacturing process.

MERLIN will develop AM techniques to allow several environmental benefits, e.g.

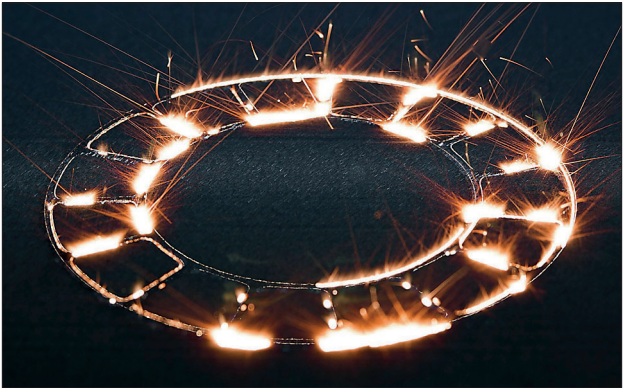
- near 100 % material utilisation
- abdication of toxic chemical usage
- use inexpensive tools.

This will impact the manufacture of future aero engine components.

Approach

MERLIN will seek to develop the state-of-the-art by producing higher performance additive manufactured parts in a more

- productive,
- consistent,
- measurable,
- environmentally friendly and
- cost effective way.



The MERLIN consortium has identified the following areas for progression beyond the state-of-the-art:

- Productivity increase
- Design and Topology optimisation
- Powder recycling validation
- In-process NDT inspection
- In-process geometrical validation
- High specification materials process development

Benefits

All of these factors will drastically reduce emissions across the life-cycle of the parts.

Using AM technologies will be beneficial through:

- significant reduction of waste and toxic chemicals in an industry which today requires massive amounts of energy and toxic chemicals.
- offering increased design freedom for manufacture of aero engine parts
- light-weighting parts which will improve performance
- reduced fuel consumption and therefore reduced emissions.



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Contact

The MERLIN consortium technically coordinated by Rolls-Royce comprises six world leading aero engine manufacturers, six renowned RTD providers and two intelligent SMEs.

Impact will include the development of high value, disruptive Additive Manufacturing technologies capable of step changes in performance. This will safeguard EU companies in the high value aero engine manufacturing field.

For more information on the project please contact the management team through the project website or directly on the e-mail below.

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