



ZIM Success Story

Central Innovation Programme for SMEs

Cooperation Projects 107



Repair instead of dispose

Inspection-, repair- and testing methods for damaged carbon fibre reinforced components

Carbon fibre reinforced plastics (CRP) make their way into several branches and areas of applications during the last years due to outstanding mechanical material features. With suitable fibre strengthening CRP can as well gain the stiffness and solidity of steel. Due to variable possibilities of shaping the material can be used in a wide spectrum of lightweight constructions at state of the art mentioning the realisation of resistance in fatigue, abrasion and corrosion. Nowadays these features make CRP very successful in the application of aerospace, automotive and high-performance sports. For example the tail plane units assembled at Airbus account for the biggest structural component made of CRP in commercial aircrafts worldwide. Resulting from the extreme mechanical load these components can as well show severe damage in material

structure which could not be fixed properly up to today. Current approaches in a case of damage show repairing techniques on an experimental level which do not present the requirements of a stable process of reproducible quality and high component stability. Suitable technical equipment for an exact analysis of the damage as well as mechanical inspection procedures for repaired CRP components were not existing so far. Damaged parts used to be disposed relatively often.

Cooperation partners out of small / medium sized enterprises and research institutes counting two from Austria and seven from Germany are committed in a joint EraSME project to develop an innovative technical service for this specific area of application.

This project was supported by the German Federal Ministry for Economic Affairs and Energy based on a resolution passed by the German Bundestag.

Project duration: April 2012 to March 2014

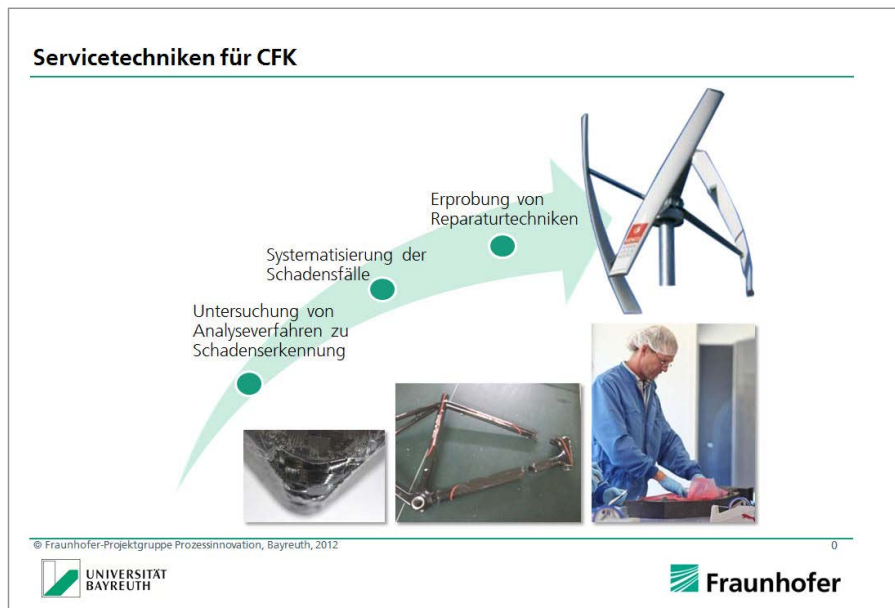
The Central Innovation Programme for SMEs (ZIM) provides support for innovative technologies and industries all across Germany in a variety of arrangements:

- Individual ZIM projects
- ZIM cooperation projects
- ZIM cooperation networks

For information and advice on cooperation projects:

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Key points of the project ReCarboFit



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The product and its innovation

Result of this European research cooperation is an integrated system of repairing damaged CRP components with a new method inspection-, repairing- and testing. It is applicable in small and medium sized enterprises and enables the non-destructive examination and reparation in a wide spectrum of CRP assemblies.

As single components the following results can be offered:

- Analysis methods to detect damages
- Comprehensive basis of data for the analysis of typical damage cases in various CRP branches with regard to specific damage characteristics and the frequency of the particular type of damage
- Classification model of different damages
- Method based techniques for repairing CRP components
- Mechanical screening procedure for fixed components
- Analysis of expenditure

Market and customers

The cooperating companies are already using the results of the project in order to repair CRP components. Thereby the newly developed repairing system can be used for functional component features as well as for restored load bearing and safety relevant structural components. The Fraunhofer project group "Process Innovation" plans on implementing the results in maintenance seminars, in

order to offer the innovative technology to a wide circle of SMEs.

The cooperation partners

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