

Aerospace

DAHER undertakes 4 aerospace R&T programmes confirming its strength in innovation with composite materials

Paris, April 14, 2009 – Within the scope of its activities as an aircraft manufacturer and tier-1 supplier of equipment and services to the aerospace industry, DAHER is a key partner to manufacturers in the design and production of composite and metallic fuselages, sections, airframes and aerostructures.

In anticipation of the demand from aircraft manufacturers for weight reductions, the Group has launched 4 major Research and Technology (R&T) programmes:

ADVITAC, ECOWINGBOX, FUSCOMP and NOFUDEM.

In this way, DAHER is building the resources necessary to offer aircraft manufacturers next-generation aerostructures and to be at the heart of projects for the future: "all composite aircraft", "all electric aircraft" and "green" aircraft.

Each programme is aimed at one structural element of an aircraft:

- The aim of the **ADVITAC** programme is to build a composite tail cone equipped with the APU system, designed for business and regional aircraft.
- The **ECOWINGBOX** programme involves the design and development of a wing fairing box section made of composite materials and with integrated systems. It is aimed at business jets and regional aircraft.
- The **FUSCOMP** programme aims to design a fuselage section using composites and will be engineered on a business aircraft platform.
- The **NOFUDEM** programme seeks to develop a composite nose-gear housing for commercial aircraft.

These 4 projects are being developed within the two business clusters, EMC2 and AEROSPACE VALLEY, in France's Pays de La Loire and Midi-Pyrénées-Aquitaine regions. They bring together several fields of expertise and industrial partners.

The four projects, which represent a total investment of 42 Million Euros, benefit from finance obtained at European level, at French national, regional and local government levels and from Research and Technology investments contributed by each industrial or academic partner.

The details for each project can be found in the sheets attached.

About DAHER

DAHER is a European integrated equipment and services supplier.

DAHER specializes in the Aerospace, Nuclear, Defence and Industry sectors and offers "Manufacturing and Services" solutions combining three areas of expertise (manufacturing, services and transport) built into a global offer.

Founded in 1863, DAHER is an independent, international Group. With the arrival of SOCATA in January 2009, DAHER now has some 7,000 employees in 12 different countries: seven sites in Europe, two in North America, two in Africa and one in Australia.

DAHER has tripled its annual turnover in the six years from 2003 to 2009.

www.daher.com

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ADVITAC:

The aim of the ADVITAC programme is to build a composite tail cone equipped with the APU system for business jets and regional aircraft.

Description and challenges:

To create this tail cone, the European ADVITAC (ADVanced Integrated TAIL Cone) project relies on an innovative concept enabling the full integration of systems located in it, primarily the APU (Auxiliary Power Unit) and fire detection and extinguisher systems.

This project requires:

- A "best value" process for fiber placement
- A solution to ensure the electrical continuity of a composite structure, with the lowest possible impact on the resulting weight
- Conditions for accessibility and dismantling which facilitate systems maintenance operations
- The integration of fire sensors and extinguishers for fire protection in the area, using new, more environmentally-friendly solutions
- The development of low-cost, reconfigurable tools and tooling to ensure high throughput industrial flows.

This tail cone, with an average size of approximately 3m long by 150cm in diameter, is designed for business jets and regional aircraft.

End user:

EMBRAER

Partners

To achieve its objectives, this project calls on 6 European industrial and academic partners.

- **CRANFIELD UNIVERSITY** (UK) to monitor the condition of the composite materials
- **INASMET** (Spain) for the electrical continuity of the tail cone
- **NLR** (Netherlands) for the positioning of fibers
- **COROLIS COMPOSITE** (France) for the fiber placement
- **FREE FIELD TECHNOLOGIES** (Belgium) for the tail cone's acoustics (APU noise)
- **RECOMET** (Romania) for tooling innovations

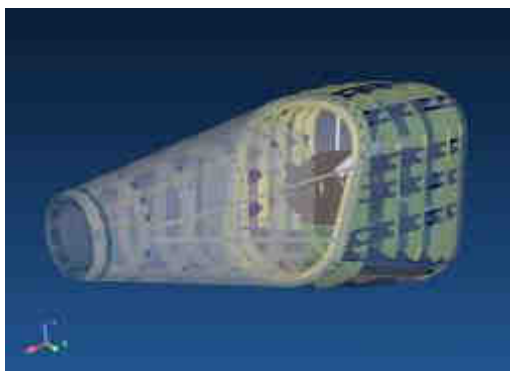
Project schedule:

The length of the programme will be 42 months from the provisional launch date in the first half of 2009.

Budget and finance:

The project has been selected by the European Commission within the FP7 framework (7th European R&D Framework Programme).

With an overall cost of estimated at 8M Euros, 50% of the finance is provided from the European Commission.



ECOWINGBOX:

The programme involves the design and development of a wing fairing box section using composite materials and with integrated systems, for business jets and regional aircraft.

Description and challenges of the project:

The aim of this project, initiated and coordinated by DAHER within the scope of its activities at the EMC² cluster in France's Pays de la Loire region, is to design a wing fairing box section, the weight of which will be significantly reduced compared to its metallic equivalent.

The design and build of the demonstrator will enable advances in multi-purpose process automation at best value and with high production throughput capability.

The project must also deliver manufacturing solutions to comply with requirements for lightning and electromagnetic protection and with requirements for the detection of impacts (which are difficult to identify visually in a composite structure) using built-in health monitoring.

These innovations are designed for medium-sized aircraft. In due course they may be used on aircraft with larger wingspans.

Partners:

The ECOWINGBOX project groups 10 partners around DAHER.

- **Europe Technologies** brings its assembly and finishing expertise
- **ESTACA** (French aerospace and automotive engineering school)
- **LAUM** (University of Maine Acoustics Laboratory)
- **CEMCAT** (Centre for the Study of Advanced Composite Materials for Transport) and
- **CERPEM** (Centre for Study and Research on Electromagnetic Protection) will be responsible for testing the functional application of the composites

- **University of Nantes**, with its various laboratories, will work on the automation of the finishing processes.

- **Coriolis Composites** will optimize the versatility of the methods for fiber placement
- **Ajilon** will design innovative composite tooling
- **Allio** and **Chastagner Delaize** will design and supply the innovative tooling

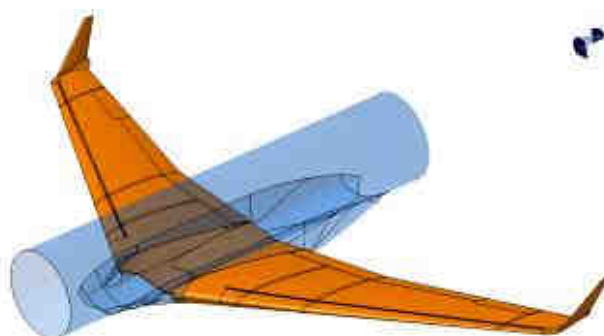
Project schedule:

The length of the project is estimated to be 3½ years from its provisional launch date in the first half of 2009.

Budget and finance:

The project, with an overall cost of 21 Million Euros and approved by the EMC² business cluster, has been selected by the FUI (single inter-ministry fund) within the scope of the 7th round of project submissions.

It is therefore financed by France's Pays de la Loire region, the FUI (single inter-ministry fund) and funds provided by the 11 partners.



FUSCOMP:

The aim of the programme is to design a fuselage section using composite materials and engineered on a business aircraft platform.

Description and challenges:

DAHER is coordinating the manufacture of a technological platform using the infusion process. This process, which is allied to the RTM process, enables the manufacture of large-sized (2 to 5m), complex, functionalized parts in a single operation without the need to carry out a high-pressure polymerization and thereby avoiding the use of autoclaves.

The technologies developed will initially be used for general aviation programmes and then for commercial aviation.

Partners:

DAHER's partners in the project are:

Two industrial partners:

- **Aerovac Système France** for the development of tooling for the infusion process
- **Sicom** for the development of new materials

and three academic partners and laboratories:

- The **ENIT** (National Engineering School, Tarbes, France) **Research Laboratory** for the characterization of materials and the implementation of research theses
- The **Laboratory of the IUT Mécanique de Tarbes** [*Institute of Mechanical Engineering, Tarbes, France*] for non-destructive testing and the implementation of theses
- The **Jean Dupuy Lycée** (college of further education) with its technology transfer platform enabling the parameterization and development of the infusion process.

Schedule:

The project was launched on October 1, 2007 and will be conducted over a period of 4 years

Budget and finance:

The project, with an overall cost of 9.2 Million Euros, was selected by the Aerospace Valley cluster as part of the 3rd round of project selection in December 2006.

64% of its financing will be provided by:

- The French state, through the FUI (Single Inter-Ministry Fund)
- The Regional Council of the Midi-Pyrénées, France
- The Regional Council of the Hautes-Pyrénées, France
- The ANRT (National Association for Research and Technology)



NOFUDEM:

The NOFUDEM programme aims to develop a nose-gear housing using composite materials.

Description and challenges:

AIRBUS has launched a nationwide project called "DEFI COMPOSITE" (the composites challenge), part of which consists of the development of a commercial aircraft nose-gear made of composite materials. As part of this project, DAHER is involved in the development of the nose-gear housing sub-assembly. To create this sub-assembly, DAHER is working on the design, the qualification of materials and the production of the nose-gear housing using the infusion process.

The objective is to develop a process that can be implemented with reduced costs.

The nose-gear housing will measure L 2.90m x H 1.20m x W 2.60m and will deliver a weight reduction of approximately 30%.

End user:

AIRBUS

Partners:

- **AIRBUS** for the specifications and support for sizing
- **EADS IW** for non-destructive testing
- **CHASTAGNER DELAIZE** for tooling
- **CD PLAST** for tooling
- **CERO** for tooling

Schedule:

DAHER is committed to delivering the part according to the general schedule of the DEFI COMPOSITE project, at the end of a 4-year period.

Budget and finance:

The project costs total 4 Million Euros, financed up to 50% within the scope of the FUI.

