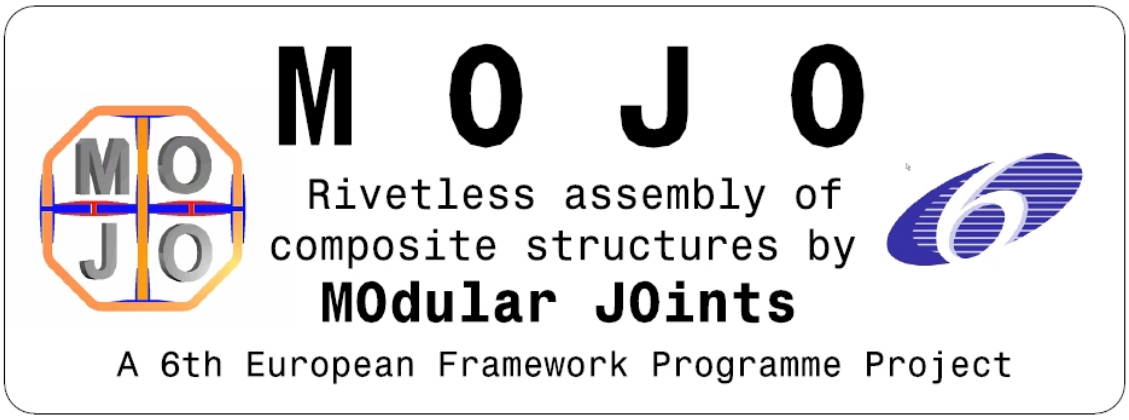


MOJO Composite Innovation

Describe your composite innovation (raw material used, processing technology ...). Please do not use a language too technical. *

The MOJO demonstrator is one of the very **first** representatives aeronautical structures designed for assembly by **structural adhesive bonding,** which provides **damage tolerant characteristics**.
This **closed beam** main components have been manufactured with **out-of autoclave infusion processes** as Resin Transfer Moulding (RTM) for the top and side panels and Vacuum Assisted Resin Infusion (VARI) process for the lower panel. **Non crimp carbon fabrics** (from SAERTEX and CYTEC) and **tailored preformed profiles** made of high performance textiles (developed by the partners) were used.
Considering that **structural bonding** is the most compatible joining method for composite parts, adhesive processes with both film and paste adhesive have been developed and successfully used for the assembly.

What is the **value created by the use of composite materials** in your innovation? *

The challenge was to create synergy between dedicated preformed profiles' infusion and adhesive bonding processes supporting different design principles. The selected principles allow the **avoidance of highly demanding integrated components** and the **reduction of the manufacturing risks.**
The presented composite innovation is a **full size aerospace structure** designed to gather all features developed in the MOJO project. It has been evaluated from manufacturing to mechanical test (from limit load, through fatigue loading and ultimate loading). A preliminary serial production study and the manufacturing of the demonstrator have shown that respectively 60% **cost savings** and 50% **weight savings** could be achieved.

Describe how your innovation is used by final end-users
(give name of final end-users if possible). *

As already introduced above, the innovation gathers various developed elements. These will ultimately find use in different domains by different end users. The end users are **SABCA, Dassault-Aviation, Premium AEROTEC, EADS Military Air Systems** and **Eurocopter**.
The used innovations will be the combination of tailored preformed profiles for modular joints with structural bonding processes, including out-of-plane reinforcements. The **applications** will be wings skin stiffened panels, vertical and horizontal tail planes, flap track beams, cargo and pax doors, cargo and pax door surroundings as well as unmanned air vehicles.

Describe the **development phase** and **launching** of your innovation. *

The launching of the innovation started with the selection, in the 6th European Framework Program, of the MOJO project (acronym for: **Mo**dular **Jo**ints for composite aircraft components).The project was **launched in 2006** and was **completed in 39 Months**. It enabled the development and demonstration of the different technologies and processes. The development phases followed the different steps needed for composite manufacturing, i.e. definition of requirements, preformed components preparation, infusion (including tooling), assembly rigs and testing. Testing was performed from the material level to the representative structure level and according the Rouchon Pyramid.

What is the **market potential** for your innovation? *

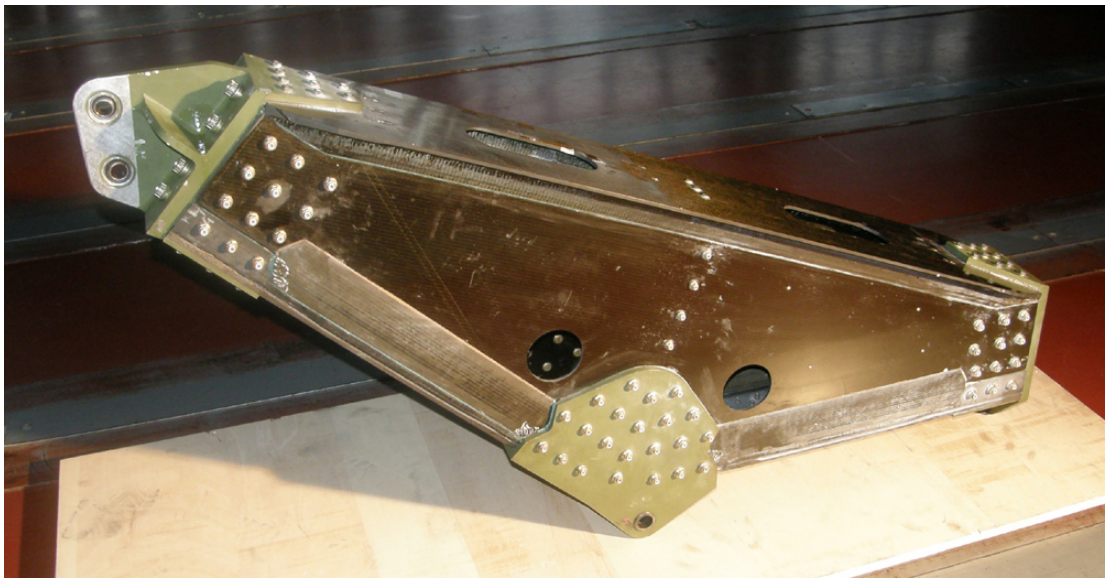
The market potential lays on **all aeronautical structures made from competitive CFRP**. Nowadays many composite structures are still designed with “black metal” parts joined by means of rivets and leave much room for improvement. This sometimes leads to composites rejection in favour of well proven metallic concepts. The MOJO concept benefits will **enable a wider and better use of composites, by offering an advantageous substitution to either composite or metallic “traditional” structural concepts**

Summarize the **key benefits** of your innovation? *

Today structural bonding is still not a widely accepted alternative to riveting. Therefore some demonstration effort like carried out in MOJO, leading to the cost and performance benefits shown (**60% in cost savings and 50% weight savings**) will help change minds and gain a wider acceptance, opening the **way to “rivet-less” CFRP structures.**

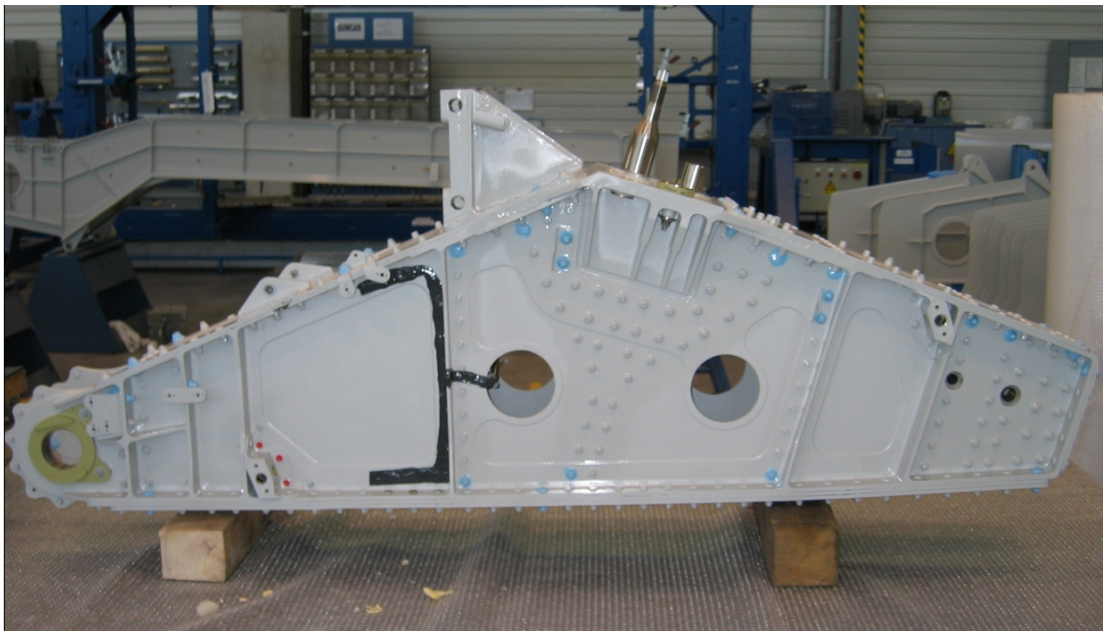
Pictures of the MOJO beam demonstrator

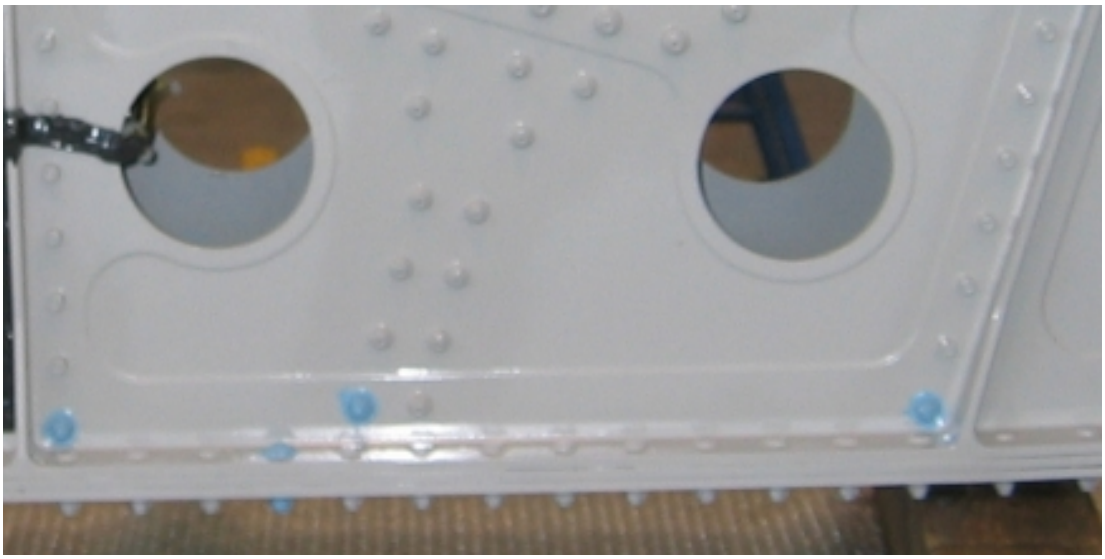
(no rivets except for test boundary conditions and load introduction area)



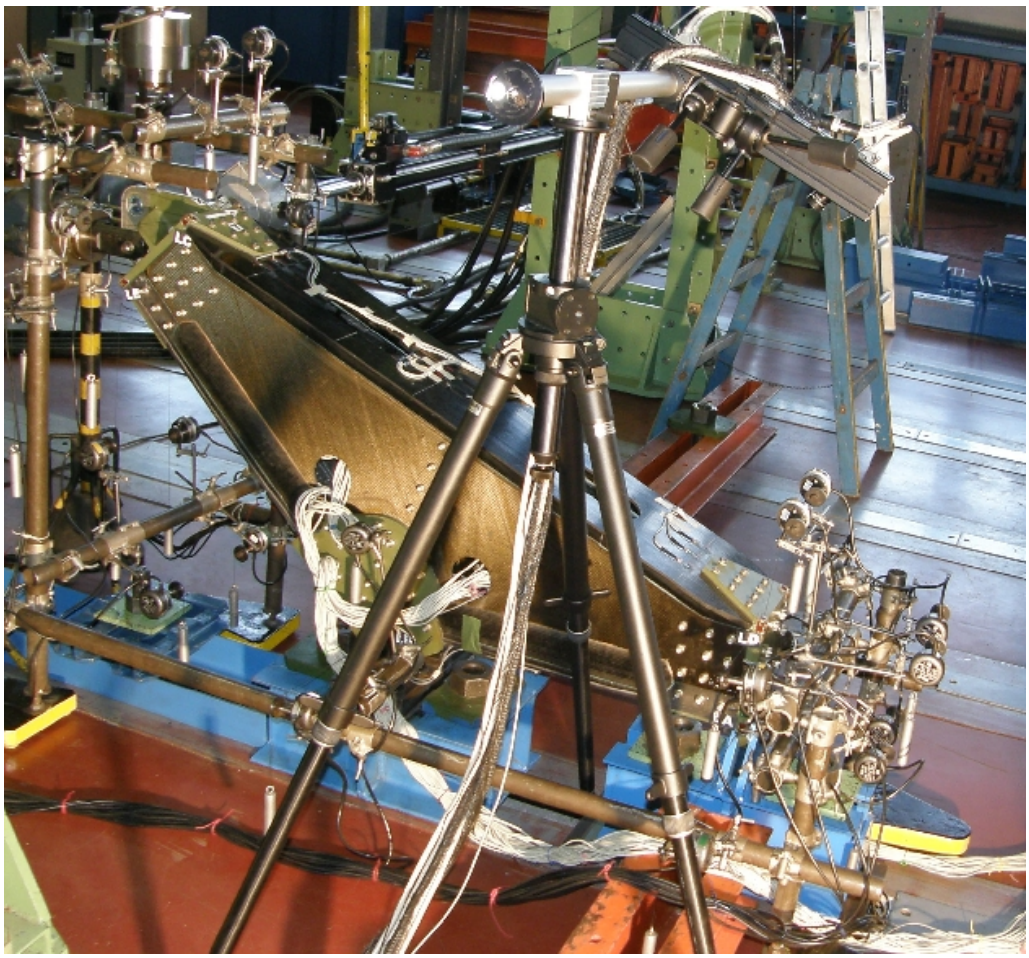
Picture of comparable "traditional" metallic riveted "flap track beam"

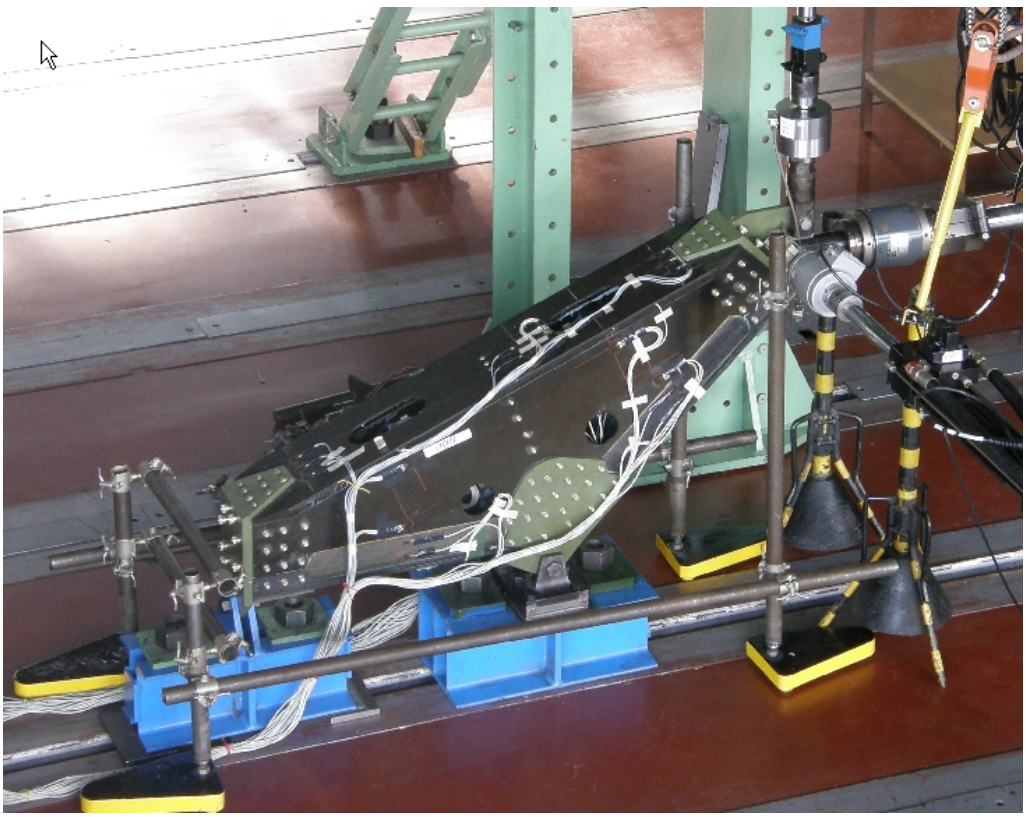
(rivets are present all along the structure)





Pictures of the MOJO beam testing in VZLU





MOJO is a 6th Framework Programme project funded by EU