PROJECT

FLY-BAG2

Advanced technologies for bomb-proof cargo containers and blast containment units for the retrofitting of passenger airplanes

Funding: European (7th RTD Framework Programme)
Duration: Aug 2012 - Sep 2015
Status: Complete with results
Total project cost: €5,683,086
EU contribution: €4,408,895

Call for proposal: FP7-AAT-2012-RTD-1
CORDIS RCN : 104541

Objectives:

The threat of attacks to passenger airplanes with explosives hidden in luggage loaded in the cargo holds or taken onboard is dramatically evident from terrorist events in the last years. FLY-BAG2 aim is to develop innovative solutions based on novel lightweight materials and structural concepts for the mitigation of the effects of an onboard blast and improve aircraft survivability. Direct strengthening of the airplane structure is not a viable solution since it would clearly result in thicker skins and a weight penalty; moreover, the related costs could not be justified in the majority of the commercial routes. Instead, the proposed blast mitigation and retrofitting solutions will be developed to be easily implemented on existing aircraft.

The project builds upon the former FLY-BAG FP7 project which developed and demonstrated a blast-resistant textile-based luggage container for narrow-body passenger airplanes. The aim is now to exploit the knowledge gathered in the previous project to develop new devices for both cabin (addressing the Least Risk Bomb Location requirements) and cargo environments and to enlarge the experimental validation of the new concepts including full scale tests on retired aircraft. Research aspects to be addressed include the correlation between explosive charge and location with baggage filling percent in the ULD, the effect of pressurisation, or the effects to the aircraft structures and the passengers. The partnership is composed by the core partners from the former FLY-BAG project enlarged by new organisations bringing relevant expertise on modelling and design of aeronautic structures. The consortium is also characterised by a significant geographical spread with 7 different European countries represented and by the involvement of 6 industrial SMEs, as a confirmation of the industrial character of the project, aiming at pragmatic solutions and industrial exploitation of the project results.

Parent Programmes:
FP7-TRANSPORT - Transport (Including Aeronautics) - Horizontal activities for implementation of the transport programme (TPT)

Institute type: Public institution
Institute name: The European Commission
Funding type: Public (EU)

Lead Organisation:

Rina Consulting Spa
Address:
VIA SAN NAZARO 19
16145 GENOVA
Italy
**Organisation Website:**  
http://www.dappolonia.it  
**EU Contribution:** €876,700

### Partner Organisations:

**Carmel Cargo Network Bv**

**Address:**  
Laurens Jzn Costerstraat 15  
3261LH Oud Beijerland  
Netherlands

**EU Contribution:** €255,150

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**Meridiana Maintenance S.p.a.**

**Address:**  
Centro Direzionale Aeroporto Costa Smeralda  
7026 Olbia  
Italy

**Organisation Website:** [http://www.meridiana.it](http://www.meridiana.it)  
**EU Contribution:** €235,800

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**Inasco Hellas Etaireia Efarmosmenon Aerodiastimikon Epistimon Ee**

**Address:**  
Napoleontos Zerva 18  
16675 Glyfada Athina  
Greece

**EU Contribution:** €138,500

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**Centro Di Ricerche Europeo Di Tecnologie Design E Materiali**

**Address:**  
Strada Statale 7 Per Mesagne Km 7.3  
72100 Brindisi  
Italy

**Organisation Website:** [http://www.cetma.it](http://www.cetma.it)  
**EU Contribution:** €441,000

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**Easc Ev**

**Address:**  
Am Flugplatz Haus 2  
14959 Schonhagen  
Germany

**Organisation Website:** [http://www.easc-ev.org](http://www.easc-ev.org)  
**EU Contribution:** €333,675

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**Dokasch Gmbh Air Cargo Equipment + Repair**
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<th>Organisation</th>
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| **Industriegebiet Feincheswiese 3** | Industriegebiet Feincheswiese 3  
56424 Staudt  
Germany | €214,250 |
| **Saechsisches Textilforschungsinstitut e. V.** | Annabergerstrasse 240  
9125 Chemnitz  
Germany | €282,800 |
| **Blastech** | PORTOBELLO 217 THE INNOVATION CENTRE  
SHEFFIELD  
S1 4DP  
United Kingdom | €621,600 |
| **Apc Composit Ab** | Karlsviksvaegen 81  
97594 Lulea  
Sweden | €266,800 |
| **Panepistimio Patron** | University Campus- Rio  
26500 Patras  
Greece | €260,800 |
| **Aernnova Aerospace S.a.u.** | LEONARDO DA VINCI Parque Tecnologico de ALAVA 13  
01510 MIÑANO (ALAVA)  
Spain | €326,260 |
| **Ziplast Srl** | Via Pelizza Da Volpedo 52 54 | |
Technologies:

- Aircraft design and manufacturing
- Blast-resistant lightweight materials and structural concepts

**Development phase:** Research/Invention

**Key Results:**

**Guarding against explosive devices on aeroplanes**

Security efforts today focus on preventing explosive devices from getting aboard commercial aircraft. An EU initiative is creating cutting-edge technology to counteract threats in case of explosive devices on board.

Security scans for 100% detection and current blast containment solutions come with drawbacks such as time, weight and cost. Another layer of protection can be added to maintain aeroplanes, crew and passengers out of harm from explosive devices smuggled into cabins and from bombs hidden in pallets or containers.

To protect cabins and cargo compartments, the EU-funded [http://www.fly-bag2.eu/](http://www.fly-bag2.eu/) (FLY-BAG2) (Advanced technologies for bomb-proof cargo containers and blast containment units for the retrofitting of passenger airplanes) is developing advanced technologies for bomb-proof cargo containers and blast containment units for the retrofitting of passenger planes. The project is developing two different devices based on flexible and lightweight textile-based materials and energy-absorbing composite elements. It also seeks to design ready-to-use blast mitigating composite panels for cabin interior retrofitting. The project builds on the advances made by its predecessor project FLY-BAG.

Halfway through its three-year period, the project has defined cabin and cargo areas and worked on the concept design. It has characterised materials through a series of tests. These include testing on the materials themselves, textiles, fabric joints, zip closures and composite panels.

Work continued with design of the explosive containment units. Detailed designs were created for critical components, cabins and cargo areas. Full-scale prototypes of blast containment units for several cabin versions were produced.

Partners also developed a mock-up of the cargo unit and explosion tests were done on the preliminary cabin demonstrators.

As work continues in the development of pioneering bombproof cabin and cargo devices, FLY-BAG2 efforts aim to mitigate the effects of an on-board explosion and improve aircraft survivability.

**Documents:**

- [Periodic Report Summary 1 - FLY-BAG2 (Advanced technologies for bomb-proof cargo containers and blast containment units for the retrofitting of passenger airplanes)](http://www.fly-bag2.eu/)

**STRIA Roadmaps:** Vehicle design and manufacturing

**Transport mode:** Air transport

**Transport sectors:** Passenger transport

**Transport policies:** Safety/Security

**Geo-spatial type:** Other