

# Insulating solutions for Aviation Lithium battery

Saint-Gobain Insulating Solution



# Aviation Lithium ion Battery Constrains

**Transportation  
Constraints**



**Standard Use  
Constraints**

## Li-ion market evolution

- \$1.6millards in 2012 → \$22 milliards in 2020 (Pike research)
- 90% of the Li-ion batteries will be transported using cargo aircraft
- 80% of Li-ion batteries will come from Asia

## Battery failure

- **Electrical** (*overcharge, rapide discharge...*)
- **Mechanical** (*physical damage, manufacturing defect, contaminant...*)
- **In Fire** (*separator melting, content mix,...*)

# Cargo Aircraft Constraints



**FIRE CONTAINMENT COVER ; LITHIUM ION BATTERY FIRE TESTS** - Shakir Jamaldeen, October 2015  
**Fire Hazards of Lithium Ion Batteries** - Richard E. Lyon, Richard N. Walters, Sean Crowley, and James G. Quintiere

# Aviation Standard Use Constraints



**The Investigation of a Lithium-Ion Battery Fire Onboard a Boeing 787 - Aspects of the Laboratory Analysis**  
Joseph Kolly, PhD. Director, Research & Engineering Joseph Panagiotou; Barbara Czech

# Insulating solutions – ProtectionION HPI 40

- Designed for thermal insulation of Li-ion EV and HEV battery packs
- Multi layer solution, matching the custom shape



- Fire resistant



- Ultra light product



- Thermal insulation  
 $\lambda < 0,04 \text{ W/m.K}$



- Acoustic insulation



- Electromagnetic shielding



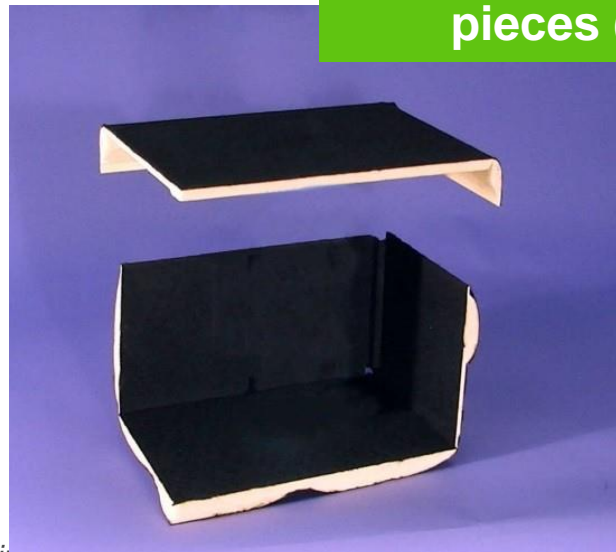
- Low cost solution



- Low environmental impact



**TRACEABILITY** of the different pieces (serial number)



VIDEO  
TEST FEU  
SUR  
PRODUIT

# Insulating solutions – ProtectionION HPI 40

5 years of  
experience

Implemented solutions on different battery packs:

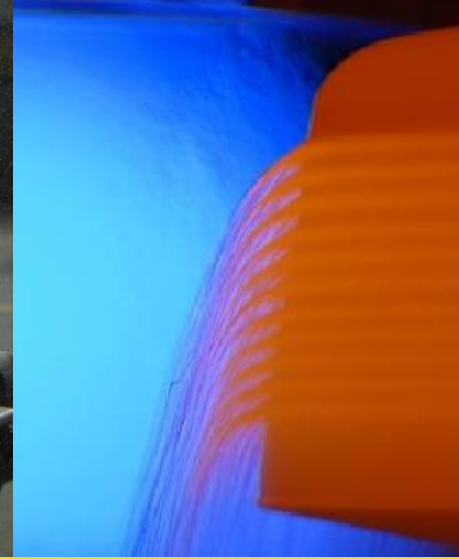
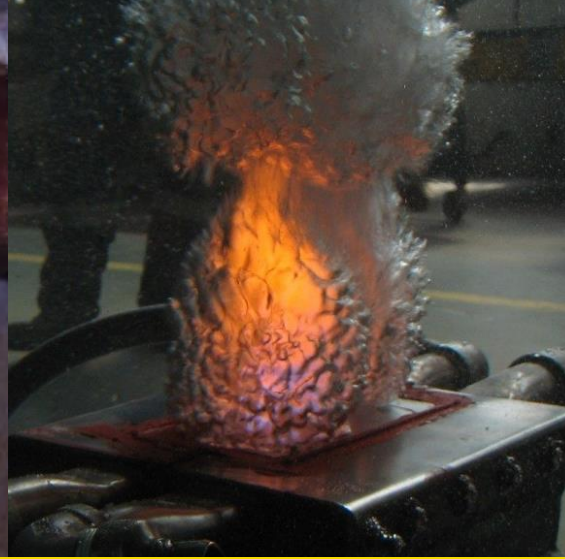
- **BLUE CAR**
- **E-MEHARI CITROEN**
- **BLUE BUS**
- **BIG BLUE BUS USA**

autolib'



RENAULT  
SPORT F1





# Thank you

Special acknowledgements to J.F. PETIT, Certification Manager R&T and Cabin Safety at Airbus

## Gifted samples

1. ProtectION HPI 40
2. Military solutions

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**ISOVER**  
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