

The Eighth Triennial International Fire & Cabin Safety Research Conference
Theme - Safety Research—Teamwork in Action
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Title: Study of temperature and fire exposure effects on Carbon Fibre Reinforced Plastic mechanical behaviour and chemical degradation

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Horizon 2020 is the biggest European Union Research and Innovation programme ever, with nearly €80 billion of funding available over 7 years (2014 to 2020) – in addition to the private investment that this money will attract. Within this framework, EREA, the association of European Research Establishments in Aeronautics has launched Future Sky Safety: an initiative in which development and integration of aviation technologies is shared by 32 European organisations. Four Themes and seven projects (5 have already started) were identified (Runway Excursions, Total System Risk Assessment, Human Performance Envelope, Organizational Accidents, and Fire Smoke and Fumes).

To illustrate the talk, the reason of the “*Mitigating Risks of Fire, Smoke and Fumes*” project proposal came from the development of larger, more electric and more lightweight aircraft (with an increase use of CFRP composite parts). In that context, the mechanical behaviour and degradation of organic composite materials at elevated temperatures or under fire needs to be better known, for safety and also maybe for health (onboard air quality) issues. Improved material solutions (for primary structures or cabin environment) will also be proposed. Some preliminary results of the project will be presented: as an example there is currently a lack of well-established protocols to assess the degradation of mechanical properties (especially in terms of compressive properties which may be important for structural strength and evacuation) and the off-gasing products (for short and long term exposition of paxs or cabin crew) of CFRP materials with the increase of temperature.