

FIRE BEHAVIOUR OF STRUCTURAL COMPOSITE MATERIALS

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With the increase in the use of composite materials for aircraft structural applications, it is essential to demonstrate that the fire behaviour of these materials is safe and that their usage will not affect the existing level of safety. Most of the tests currently used to assess the fire behaviour of aircraft materials are mainly applicable to cabin layout materials and are intended to assess their fire reaction. Except for the materials used in designated fire zones, there is little data available about the fire resistance of composite materials nor is there any specific information about the requirements.

The flammability test laboratory of *DGA Aeronautical Systems* (ex. CEAT (Toulouse Aeronautical Test Centre)) is carrying out a study to assess the fire behaviour of structural materials when they are submitted to various representative fire threats such as:

- in-flight thermal damaging (electric arc effects ; hidden fire damaging)
- post-crash fire effects on fuselage composite materials (burnthrough behaviour and environmental effects inside the cabin (smoke, toxicity, heat release)).

A Propane Fire Source representative of a hidden fire threat was designed and is used to assess the residual mechanical properties and the under load behaviour of composite materials for structural and fuselage applications. The talk will present the whole study and its progress and will develop in more detail the test results on the damage caused by hidden fire.