

Chemical Engineering Seminars – MT 2007

*Week 6: Thursday 15 November, 11:00-12:00 hrs
Lecture Room 2, Thom Building, Engineering Science*

The problem of creating fire-hard composites for structural applications

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Abstract

Fire behaviour is possibly the most important issue preventing wider use of lightweight composites in a broad range of industries, including transport and infrastructure. Understanding and modelling behaviour is the first step in the challenging process of providing lightweight materials with considerably enhanced fire resistance. Although fire response of flammable structures is often seen as a complex issue, the modelling approach can be simplified and restricted to certain key interactions between the composite material and the fire environment. This involves processes within the material: heat transport, decomposition and the decline in mechanical properties that results from these. Careful modelling, combined with simple, well-calibrated small-scale tests can provide considerable insight into composite fire behaviour. The paper will report some interesting recent results relevant to composite applications on land, sea and air. Tentative answers will be provided to the question of how the fire resistance of composite structures may be improved in the future.



Fire test on a pultruded composite section under load

Bio-sketch

Professor A.G. Gibson holds the Roland Cookson Chair in Composite Materials Engineering at the Newcastle University and is Director of the Centre for Composite Materials Engineering. CCME carries out research on composites of many types and is currently involved in composites projects in transport, oil and gas and infrastructure.