



# Hydrogen Europe: European Hydrogen & Fuel cell Project Database

## Project FIRECOMP

Modelling the thermo-mechanical behaviour of high pressure vessel in composite materials when exposed to fire conditions

Hydrogen is expected to be highly valuable energy carrier for the 21st century as it should participate in answering main societal and economical concerns. To exploit its benefits at large scale, further research and technological developments are required. In particular, the storage of hydrogen must be secured. Even if burst in service of pressure vessels in composite material is very unlikely, when exposed to a fire, they present safety challenges imposing to correctly size their means of protection. The main objective of FireComp project is thus to better characterize the conditions that need to be achieved to avoid burst. To this aim, experimental work will be done in order to improve the understanding of heat transfer mechanisms and the loss of strength of composite high-pressure vessels in fire conditions. We will then model the thermo-mechanical behaviour of these vessels. Different applications will be considered: automotive application, stationary application, transportable cylinders, bundles and tube trailers. A risk analysis will be conducted for each application leading to the definition of optimised safety strategies. The main outputs of the project will be recommendations for Regulation Codes and Standards regarding the qualification of high-pressure composite storage and sizing of its protections. The FireComp project brings together partners from diverse expertise: a GCH (Gaseous Compressed Hydrogen) technology integrator as a coordinator (AIR LIQUIDE), a pressure vessel supplier (HEXAGON), a leading actor in international Standards, Codes and Regulations development (HSL), experts in industrial risks (INERIS), experts in thermal radiation and mechanical behaviour of the composite (CNRS (Pprime & LEMTA), LMS Samtech), experts in thermal degradation and combustion of composites, numerical simulation (Edinburgh University and LMS Samtech) and an expert in European R&D collaborative project management (ALMA).

## Project Information

**Type of project :** Research

**Timing :** 01/06/2013 > 31/05/2016

**Project website:** <http://www.firecomp.info/>

**Project Budget :** 3.543.498 €

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## Funding

European Union through FCH JU: Grant agreement 325329 - [CORDIS link](#)

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## Project partners

**Coordinator :**

L'AIR LIQUIDE S.A

**Partners :**

CNRS - Centre National de la Recherche Scientifique

THE UNIVERSITY OF EDINBURGH

HEXAGON RAUFOSSAS

INSTITUT NATIONAL DE L'ENVIRONNEMENT ET DES RISQUES INERIS

HEALTH AND SAFETY EXECUTIVE

SAMTECH SA

AYMING

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**Sub project(s)**

**Sub project 1**

**Country:** France

**Address:**

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**Sub project categories**

Research

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Project Id: 967

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