Business from technology

FIRE-RESIST - Developing Novel Fire-Resistant High Performance Composites

Project overview

E-LASS kick-off meeting 8.-9.10.2013 @ SP

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FIRE-RESIST

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- EU FP7 research project for 2011–2014
  - total budget of 7.7 M€
  - coordinated by University of Newcastle
  - 18 beneficiaries, including transport sector companies (rail, aeronautic and maritime), material manufacturers and research organizations

- The overall goal of FIRE-RESIST is to

> develop novel, cost effective, high-performance, lightweight polymer matrix composite materials with a step-change improvement in fire behaviour

- Five specific S&T objectives

Project beneficiaries

CYTEC

newrail

swerea | SICOMP

INSA LYON

GAIKER ik4 research alliance

EADS

Steinbeis Advanced Risk Technologies

VTT

GL Group

FLENSBURGER SCHIFFBAU-GESELLSCHAFT

BALance® Technology Consulting

AMORIM Amorim Cork Composites

BOMBARDIER

APC Composite

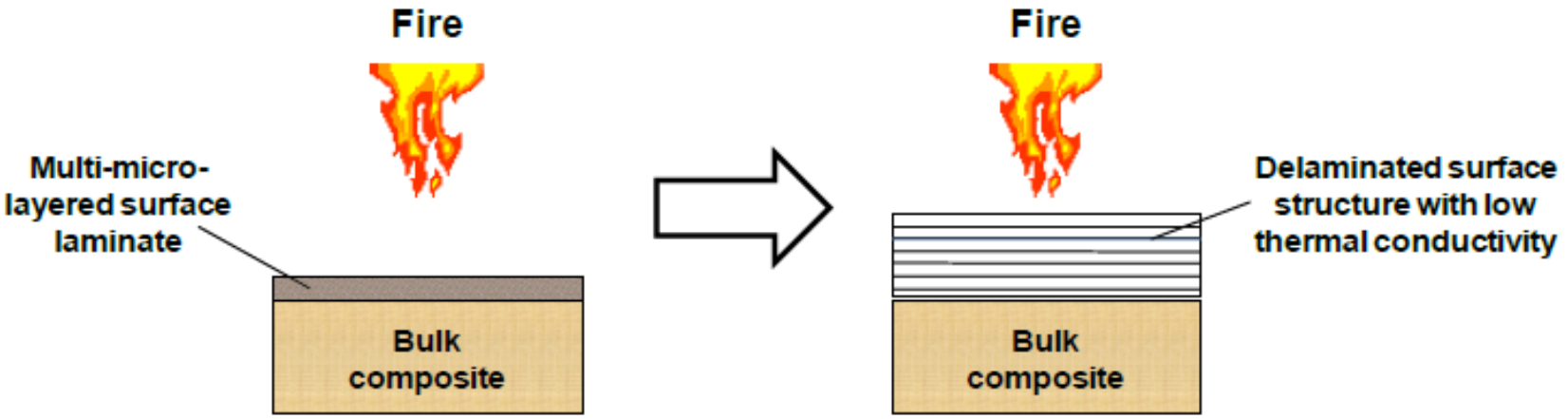
proplast PLASTICS INNOVATION POLE

tfc BIOMASS BASED CHEMICALS

SP your Science Partner

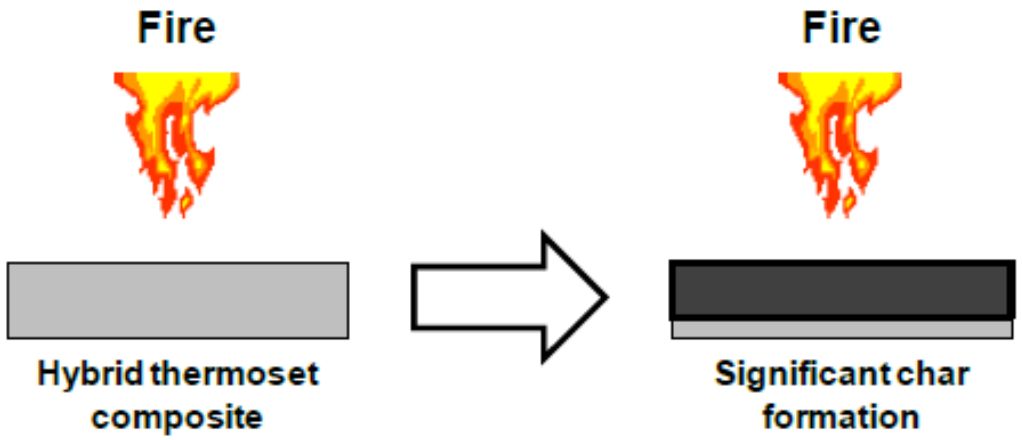
Objective 1: multi-micro-layered structural composites that provide a step-change improvement in fire behaviour

- Micro-layered structural materials that are designed to delaminate extensively when exposed to heat, thus generating a fire barrier of exceptionally low thermal conductivity



Objective 2: hybrid thermoset composites that provide a step-change improvement in fire behaviour

- Hybrid thermoset composites that are polymeric at normal temperature, but which decompose under fire to provide highly protective ceramic char phases



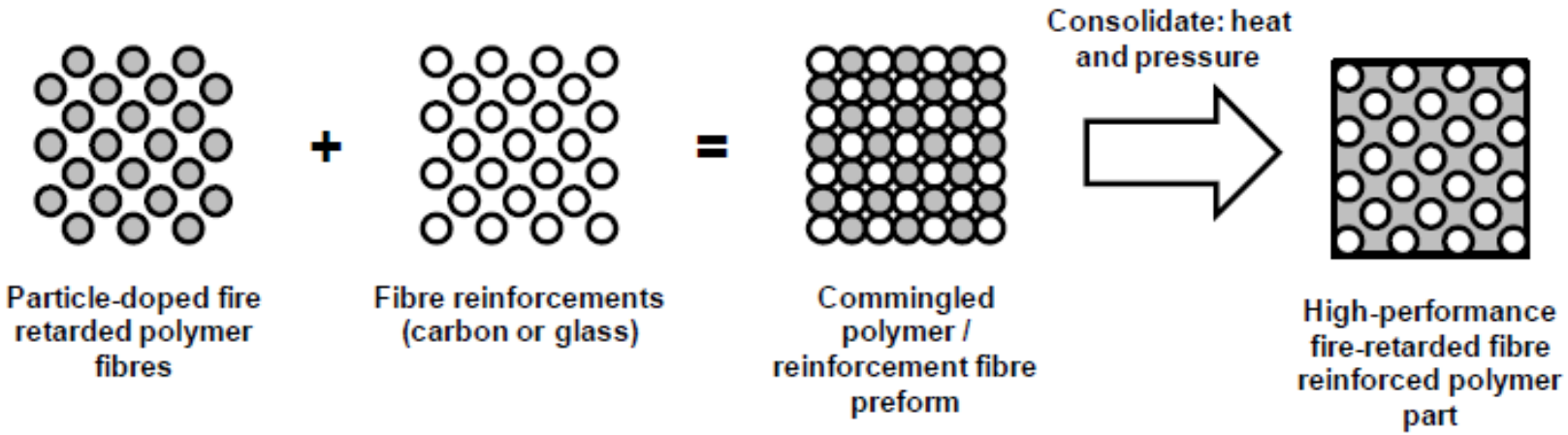
Objective 3: high char polymer matrix composites derived from natural sources that provide a step-change improvement in fire behaviour

- Development of mainly glass fibre reinforced composites with enhanced char-producing capabilities

- Use matrices from natural and sustainable sources, most notably those involving furan and lignin-based precursors
- Target is to achieve high yields of char (40–60%) in fire conditions

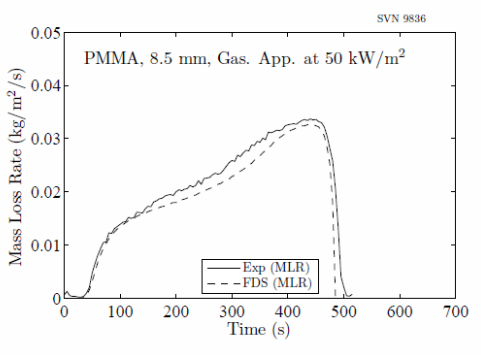
Objective 4: particle-doped polymer fibres for fire-retarded commingled composites

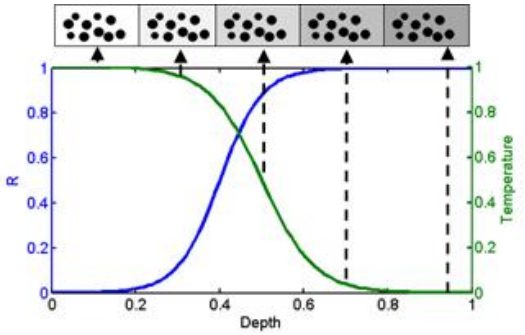
- Commingling of particle-doped polymer fibres and conventional fibre reinforcements for the highly efficient dispersion of fire retarding particles within a composite



Objective 5: advanced multi-scale simulation of polymer matrix composites in fire

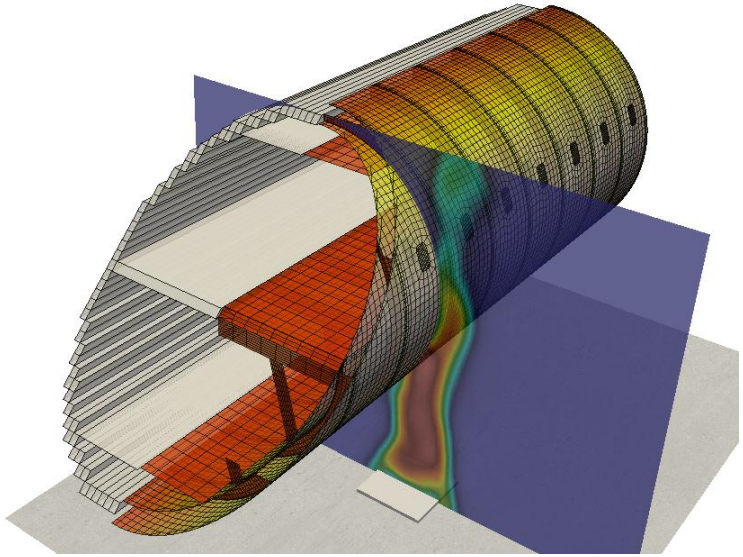
- Simulation methods for the response of polymer matrix composite materials and structures to fire



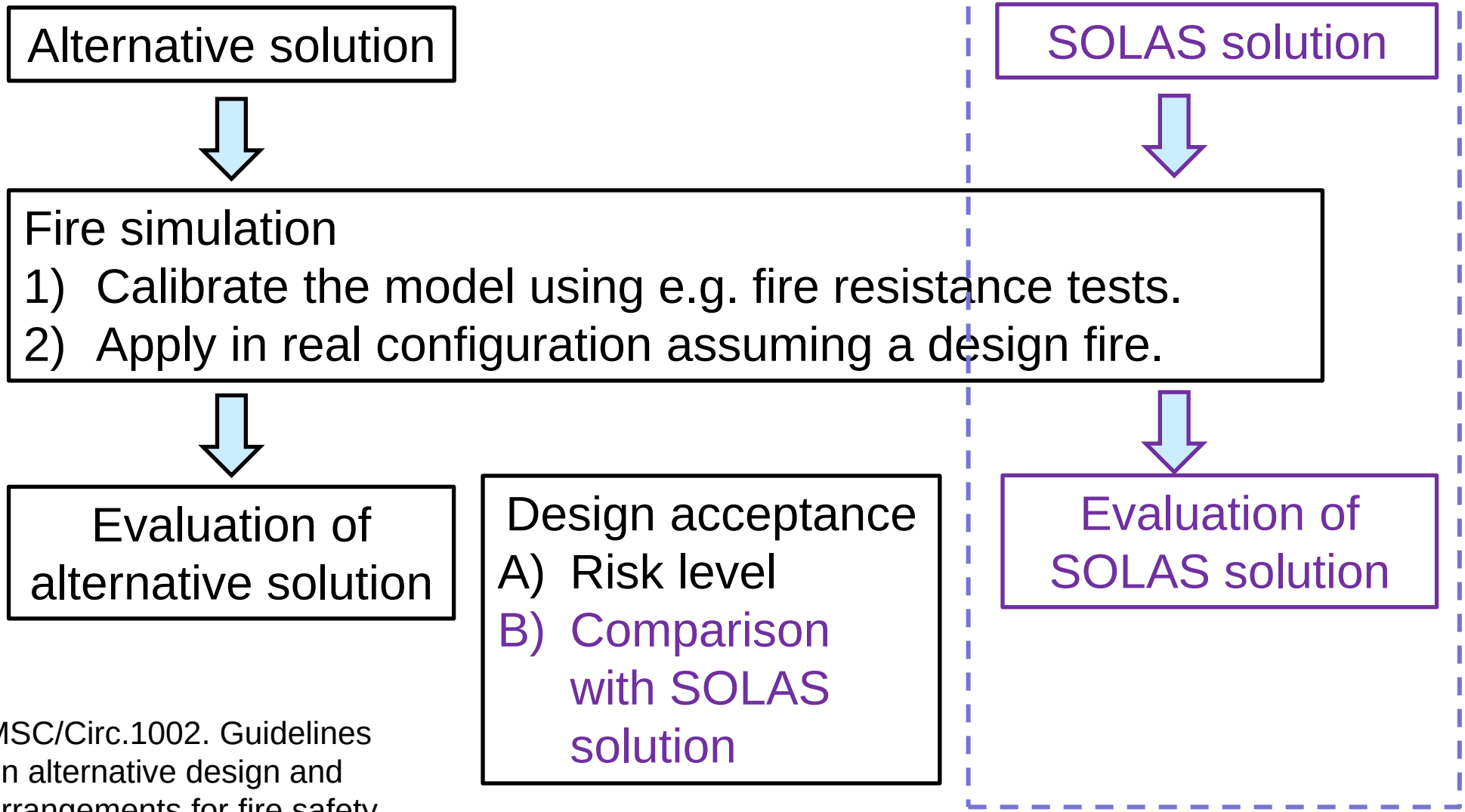


- CFD-FEA coupling methodology
- Material models for the fire and structural simulations

- Experimental validation of the full simulation chain



Evaluation of alternative solutions by simulation



MSC/Circ.1002. Guidelines on alternative design and arrangements for fire safety

VTT creates business from technology