Simulation of the behaviour of composite crashworthiness, fatigue resistance and vibroacoustics

COPERSIM project

The Copersim project focuses on building a methodological approach to modelling composite materials to improve the simulation tools in three performance areas: crashworthiness, fatigue resistance and vibroacoustics.

Technical and economic impacts

- Reducing vehicle weight through the use of composites
- Reducing the length of the design phase through the use of more effective tools

Keywords

TP and TS composites // Crashworthiness
Vibroacoustics // Fatigue resistance
Digital simulation

Summary of experimental specimen tests
july 2015

Summary of experimental prototype tests
july 2017

Implementing withincommercial software programmes
july 2018

june 2014
Project launch

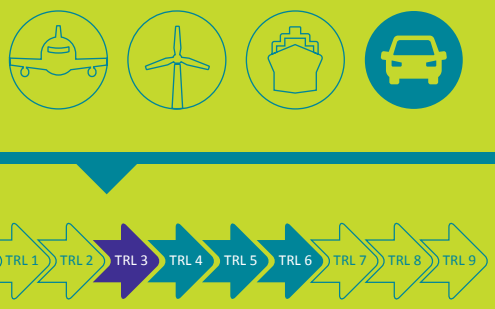
march 2017
Virtual machine

july 2017
Summary of digital simulations of parts

july 2018
End of project

INDUSTRIAL CONTEXT

European regulations aim to reduce CO2 emissions down to 93g/km by 2020. To reach that goal, French builders must reduce the fuel consumption of vehicles, and one way to do so is to use composites to optimise vehicle weight.
However, current software programmes are not predictive enough to be able to integrate composite materials into the design of structural safety parts.



INNOVATIVE FEATURES

- Crashworthiness, fatigue-resistance and vibroacoustic characterisation methodology: reducing the number of tests.
- Fatigue resistance modelling: developing and implementing behavioural laws for TP and TS composites.
- Crashworthiness modelling: developing behavioural laws for TP composites and implementing in commercial software programmes.
- Design phase times can be reduced by optimising the models.

INDUSTRIAL APPLICATIONS

The project will further the use of composites in the automotive industry through a better understanding of their behaviour in service, using predictive simulation tools that are compatible with automotive design phase times.

Partners members of the IRT

- IRT JULES VERNE
- CETIM
- FAURECIA
- PLASTIC OMNIUM
- PSA PEUGEOT CITROEN
- RENAULT
- SOLVAY
- GEM (UMR CNRS, ECN, UNIV NANTES)
- LAUM (UMR CNRS, UNIV DU MAINE)
- LEM3 (UMR CNRS, ARTS ET METIERS PARISTECH, UNIV LORRAINE, ENIM)

Others partners

- ALTAIR
- ALYOTECH

Budget

- 5 512 k€

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