STORHY FINAL EVENT
HYDROGEN STORAGE SYSTEMS FOR AUTOMOTIVE APPLICATION
PSA POISSY, JUNE 3-4, 2008

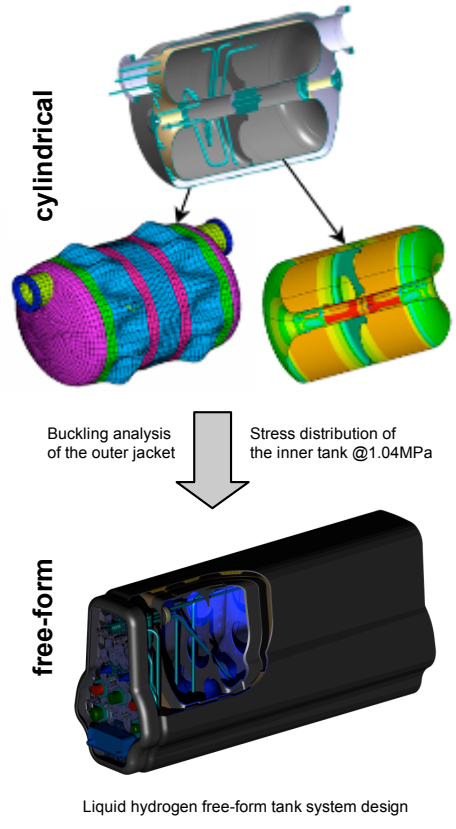
Design & Requirements for Cryogenic Storage

Objectives

- Specification of the cryogenic storage system and definition of the system concept
- Design of the free-form storage systems and of the cylindrical prototypes
- Simulation of the tank behaviour according to defined requirements

Achievements

- **Use of fibre reinforced materials (FRM) in cryogenic conditions**
  First vacuum insulated liquid hydrogen tank made of FRM worldwide
- **Significant increase of the gravimetric energy density**
  Weight reduction of **66 %** in comparison to stainless steel
  Weight reduction of **33 %** in comparison to aluminium
- **Adaptation to the vehicle structure**
  First liquid hydrogen free-form tank demonstrator
- **Reinforcement concepts with tension sheets and tubes**
  Reduction of stress and lower deformation in highly loaded areas
  Both concepts were successfully tested at cryogenic temperatures.
- **Integrated auxiliary systems**
  Higher volumetric energy density of the whole system thanks to higher integration level
- **Validation of simulation tools**
  Calculation software offers a good prediction of the tank behaviour at temperatures between -253°C and +85°C.
  Simulation values correlate with the test results.



Liquid hydrogen free-form tank system design

Future Perspectives

- Simplification of system components → reliable, cheaper system
- Improvement of the thermal insulation
- Structural optimisation (e.g. interfaces) based on the experience with cylindrical storage systems

Partners

- Air Liquide
- Austrian Aerospace GmbH
- BMW Forschung und Technik GmbH
- Institut für Verbundwerkstoffe GmbH
- Linde AG
- MAGNA STEYR Fahrzeugtechnik AG & Co KG
- MT Aerospace AG
- Oerlikon Space AG
- Prochain e.V.
- Volvo Technology Corporation

Website

www.storhy.net

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