Shoulder to shoulder across borders: Light Vehicle 2025 Demonstrators

1. # Body module
e.g. bonnet, door
Demo Leader: Jean-Pierre Heijster, Automotive NL

2. # e-Powertrain module
e.g. gearbox housing
Demo Leader: Ioanna Koutla, Université de Liège

3. # Suspension module
e.g. AM-consolidated parts
Demo Leader: Jan Stroobants, Flanders Make

4. # Hydrogen tanks
For fuel cells
Demo Leader: Dr. Michael Effing, AMAC

✓ We have chosen four demonstrators

Project Partners

Co-Financers

Wallonie
Anti-roll bar. Why?

- Passive adaptive anti-roll bar with variable (progressive) stiffness, offering comfort and performance at the same time

- Advanced lightweight anti-roll bar solution

- Capabilities for engineering & production in Euregio Meuse-Rhine
Application example

Characteristics:

• Audi A6 anti-roll bar

• Current material: steel
• Current weight: 2,85 kg

• New material: composite (glass fiber + epoxy resin)
• New weight: 2,35 kg
Objective of the Demo Project

- Design & optimization of anti-roll bar
- Simulation, virtual prototyping
- Physical prototyping
- Supply chain validation
- Feasibility of prepregs, composites and forming process
- Validate connection with vehicle body and other suspension components
Partners

DRiV
www.driv.com
Emilie Boulay
eboulay@driv.com
Main Responsibility:
Requirements & testing

Flanders Make
www.flandersmake.be
Jan Stroobants
jan.stroobants@flandersmake.be
Main Responsibility:
Engineering & testing

CompDesE UG (haftungsbeschränkt)
www.compdese.com
Adam Kot
adam.kot@compdese.de
Main Responsibility:
Engineering & manufacturing
## Partners and External Service Providers

<table>
<thead>
<tr>
<th>Design &amp; Engineering</th>
<th>Raw Materials</th>
<th>Tooling &amp; Equipment</th>
<th>Tier 1 &amp; Tier 2</th>
<th>OEM</th>
<th>Testing &amp; Validation</th>
<th>Prototyping &amp; Assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td>CompDesE (DE)</td>
<td>AGY (USA)</td>
<td>ITA GmbH (DE)</td>
<td>DRiV (BE)</td>
<td></td>
<td></td>
<td>ITA GmbH (DE)</td>
</tr>
<tr>
<td>Flanders Make (BE)</td>
<td>Lange+Ritter GmbH (DE)</td>
<td>FRT bvba (BE)</td>
<td></td>
<td></td>
<td></td>
<td>Flanders Make (BE)</td>
</tr>
<tr>
<td>KU Leuven – MTM (BE)</td>
<td></td>
<td>Janssenswillen Metaalbewerking (BE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ULiège (BE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TetraVision (BE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Altair Inc (US)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Scope of the project

• Converting the central straight section of the anti-roll bar to a composite version

• Material selection: fiber & resin
• Composite lay-up design
• Design to fit in existing packaging space

• Prototyping

• Tooling design & conception of test setups
• Validation on different levels
  • Component stiffness behaviour, strength & durability
  • Component mounted on vehicle: suspension behaviour & road testing
Design & engineering

Material modelling
Braided GF structure

Component modelling
Composite component design

Adhesive selection & proto’s
Prototyping & testing

Composite production – central torsion section

1) Mold for wax core
2) Molded wax core
3) Overbraiding
4) Vacuum infused part

Test setup A – central torsion section

First setup

Test setup B – complete anti-roll bar
Expected deliverables

**Virtual prototype**
Simulations proving the progressive stiffness behaviour & component integrity

**Physical prototype**
Progressive anti-roll bar that fits in existing Audi A6 test vehicle
Designed and engineered for real life usage over normal life time

**Validation tests**
Component level testing: stiffness & durability
System level testing (in vehicle): handling characteristics

**LCA study**
benchmarking current steel version vs prototype version
Schedule

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Design and Engineering</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Material Selection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tool/ Fixtures Design</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prototyping/ Molding</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Component Testing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vehicle Testing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analysis (Cost, LCA, others)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Design and Engineering
- Material Selection
- Tool/ Fixtures Design
- Prototyping/ Molding
- Component Testing
- Vehicle Testing
- Analysis (Cost, LCA, others)

COST, LCA