



# MSc Thesis – Crash simulation of sustainable cellular materials in battery housings

## Background

There is an increasing demand for more sustainable vehicle concepts in order to reduce the CO<sub>2</sub> footprint of mobility. This is not only limited to the power source but also applies to the vehicle structure itself. Therefore, sustainable biobased materials such as wood and cork are of increasing interest for energy absorbing purposes in automotive applications. One such application is the design optimization of a cork based battery module in the battery housing of an electric vehicle including design for service and disassembly and NVH.



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**Your goal** in this thesis is to develop a mechanical simulation model of an innovative cork-hybrid battery module for studying impact scenarios, thus enhancing safety and sustainability and performance in electric vehicles

## Tasks

- **Get familiar** with crash simulation approaches using the FE-solver LS-Dyna.
- **Understand** modeling approaches for biobased cellular structures such as cork
- **Develop** a digital twin of the biobased battery module and perform virtual crash tests against different loading scenarios
- **Implement your ideas** in the establishment of a material model for cellular structures
- **Cooperate** with renowned industry partners.

## Desired qualifications:

- Interest in the research area of E-Mobility and biobased materials
- Basic skills in numerical modeling are advantageous
- Structured and independent way of working

## Recommended as

- Master thesis for Mechanical Engineers and Process Engineering
- Bachelor thesis would also be possible

## Organisational

- Start: Beginning with November 2024
- Scholarship: min. € 2.500,- for successful completion of the master thesis. No scholarship for bachelor thesis.
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