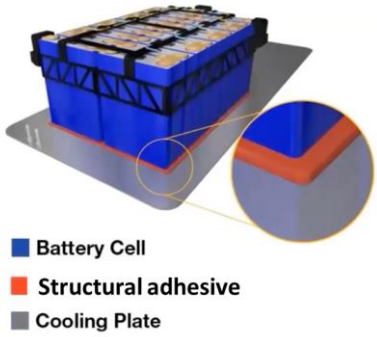
Vehicle Safety Institute

MSc/BSc Thesis – Mechanical characterization of structural adhesives for e-motorcycles

Background

The architecture and components of a battery pack can significantly influence the crash safety of an electric vehicle.
E-motorcycles are particularly affected because of the missing deformation-free zones. Structural adhesives play an important role due to their unique properties. The adhesives provide mechanical stability in a battery pack and act as a cooling system and electrical insulator.
Additionally, the adhesives can act as energy absorbers in case of crashes and reduce the loads acting on the battery cells to increase the crashworthiness.



Your goal is to mechanically characterise a structural adhesive in experimental investigations and develop a simulation model to reproduce the adhesive virtually.

Tasks

- **Get familiar** with experimental testing methods and virtual simulation models.
- **Understand** the mechanical properties of structural adhesives.
- **Develop** a virtual simulation model based on the experimental investigations.
- **Implement your ideas** in a practical way and increase the safety of e-motorcycles.
- **Cooperate** with renowned industry partners.

Desired qualifications:

- Interest in the research area of E-Mobility
- Structured and independent way of working
- Knowledge of FE simulation, preferably LS-Dyna
- The thesis can be written in German or English

Recommended as

- Master thesis for Mechanical Engineers
- A bachelor thesis is also possible

Organisational

- **Start**: October 2023
- **Scholarship**: min. € 2.500,- for successful completion of the master thesis. No scholarship for bachelor thesis.
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