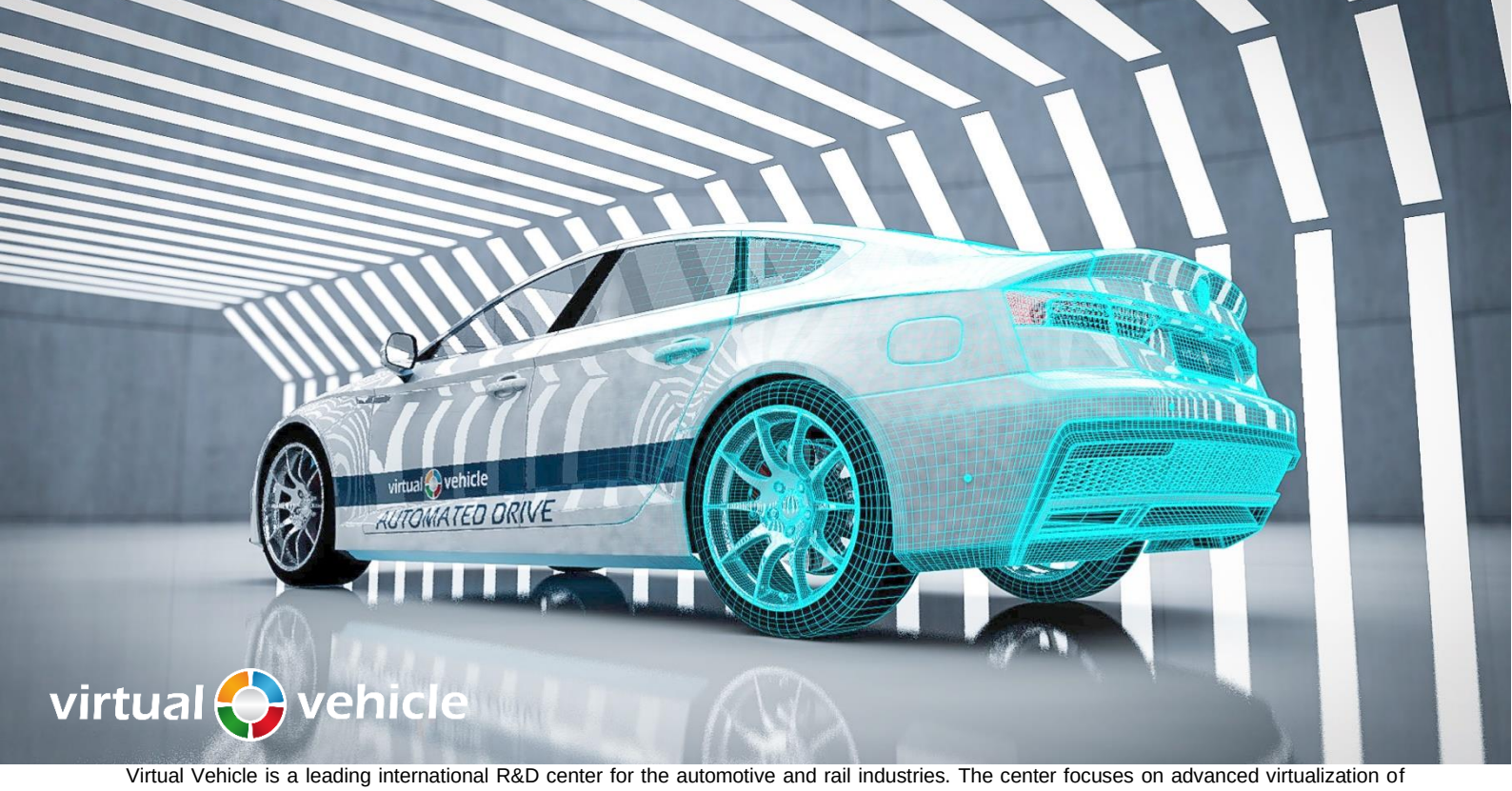

Virtual Vehicle is a leading international R&D center for the automotive and rail industries. The center focuses on advanced virtualization of vehicle development. About 300 people are employed at the site in Graz - their expertise enables the efficient development of affordable, safe and environmentally friendly vehicles.

Master Thesis

"Characterize the reaction of coolants on hot-plates"

Ref.Nr. E_132 **Master Thesis**

In the recent years both, the electromobility and the Li-ion battery technology showed impressive progress. New electric vehicles have ranges above 500 km, energy consumption of 180 Wh/km and can be fast-charged charge with more than 250 kW. Fast charge needs good cooling of the batteries. One of the best options is the direct cooling of the cells with electrically non-conductive coolants.

In case of a severe battery failure (crash, thermal runaway of a cell) the coolant may play a critical role in cooling of overheated parts. The goal of the thesis is to experimentally characterize the reaction of different coolants and hot plates (up to 800°C). The research questions are: Does the coolant ignite? Which gases are produced during the decomposition? The reaction should be observed visually and with gas analysis.

TASKS

- Design a laboratory setup for the measurement
- Order and assemble missing parts
- Test different coolants at different temperatures and atmospheres
- Make gas analysis (with GC and FTIR) for selected experiments
- Systematic documentation of the experiments

PROFILE

- Studies in chemistry, physics, mechanical engineering or similar
- Interest in designing and mechanical assembly of test-stands
- Interest in working in a laboratory and workshop environment
- Interest in automatisation and data analysis (Labview, Python)
- Interest in Li-ion battery technology

OFFER

- Collaboration and contribution in an engaged, dynamic team
- Interesting work in an international research center
- **Paid** thesis
- Mentoring program for new employees'
- Diverse sports and health activities regularly
- Corporate events

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