



APPLY NOW

VIRTUAL VEHICLE

PhD Position in Optical Diagnostics & Battery Safety (f/m/d)

Virtual Vehicle Research GmbH (Graz, Austria) is offering a PhD position within the research project *VENGA*, focusing on the development of advanced optical measurement techniques for battery safety applications.

The project aims to investigate the velocity distribution of venting gases during thermal runaway events in lithium-ion batteries using tunable diode laser absorption spectroscopy (TDLAS) combined with tomographic methods.

We are **currently** looking for a

PhD Researcher (w/m/d)

Graz | full-time | immediately

Your Tasks

- Development and implementation of laser-based measurement systems
- Experimental investigations in gas laboratories and thermal runaway test facilities
- Data analysis and tomographic reconstruction of flow fields
- Collaboration with academic and industrial partners

Your Profile

- Master's degree in physics, mechanical engineering, electrical engineering, or a related field
- Interest in optical measurement techniques, spectroscopy, and fluid dynamics
- Strong analytical skills and motivation for experimental research

What We Offer

- A 30-month PhD project in a leading research center in electromobility
- Varied and diverse range of tasks in an international research center
- Exciting, interdisciplinary work environment with plenty of creative freedom
- Possibility of home office and individual time management
- Flat hierarchies, that foster responsibility and collaboration
- Personal and professional development opportunities
- Welcome Day and mentoring program
- Sports and health activities, e.g. weekly yoga, company runs
- Company events

The minimum annual salary, depending on qualification and classification, is **EUR 45.738 gross (fulltime)**. An **overpayment** is possible and depends on qualification and the present special experience.

Gender Equality and Equal Opportunities

The project is funded by the **Austrian Research Promotion Agency (FFG)** and, in this context, places a particular focus on promoting women in research. **Applications from women are therefore particularly welcome.** In the case of equal qualifications, women will be given preference.

Detailed description

The PhD project *VENGA* focuses on the experimental investigation of venting gas dynamics during thermal runaway events in lithium-ion batteries. Thermal runaway is a critical safety issue in electromobility, where a failing cell releases hot, reactive gases that can lead to fire propagation. A key parameter for understanding and mitigating these events is the velocity distribution of the emitted gases, which strongly influences heat transfer, flame propagation, and the interaction with surrounding components.

Within this project, a novel, non-intrusive measurement system based on tunable diode laser absorption spectroscopy (TDLAS) will be developed. This optical technique enables high-speed measurements of gas properties by analyzing absorption spectra and exploiting Doppler-induced frequency shifts. To move beyond line-of-sight measurements, multiple laser paths will be combined

with tomographic reconstruction methods, allowing the spatially resolved determination of gas velocity fields.

The work includes the design and setup of the optical system, experimental validation in controlled gas flows and high-temperature environments, and application under realistic thermal runaway conditions using dedicated test facilities. The generated data will support the development and validation of simulation models and contribute to improved safety concepts for battery systems.

APPLY NOW and JOIN OUR TEAM

Virtual Vehicle

VIRTUAL VEHICLE develops innovative solutions for future mobility - reliable simulation technologies, software-defined systems, and data-driven solutions. Our focus lies on the optimisation of test and validation processes in the automotive and rail industries - with an increasing focus on future-oriented domains such as energy, maritime, defence and health tech. In close cooperation with industry, research and science, we bring new technologies into direct application. With about 300 employees, we are not only a key driver of innovation, but also a place for brilliant minds who really want to make a difference. Whether you are studying, starting your career or already have experience, you will find exciting projects, creative freedom and development opportunities with us.

Contact

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