

Industrial PhD Position

GRZ Technologies Ltd. offers, in joint collaboration with EPFL, an industrial PhD position in the field of “Thermal modelling of metal hydrides compression and storage systems”. The PhD student will be fully employed by GRZ Technologies Ltd. (www.grz-technologies.com). The academic supervision will be ensured by Prof. Andreas Züttel, head of the Laboratory for Materials in Renewable Energy (<https://www.epfl.ch/labs/lmer/>). The doctoral title will be awarded by the School of Chemical Engineering of EPFL.

Background and Motivation

Green hydrogen is expected to play a significant role in the future, as it can efficiently store the excess electricity generated with the renewable energy resources. Among the various alternatives of hydrogen energy storage, the application of metal hydrides is both safe, energy efficient and cost-effective. In this method, hydrogen is absorbed within the metal hydride powder during the filling process and is released with the heat up of the container. Since only heat is utilized for the absorption and desorption of hydrogen, there is no need for a mechanical compression or high pressure supply, which results in significant efficiency gains for the overall system.

The accurate control of the heating/cooling of the hydrogen container as well as the optimized thermal design of the storage system is critical for fast, safe and precise absorption and desorption of hydrogen. In addition, the thermochemical interactions have to be accurately accounted for, as they determine the absorption and desorption rates of hydrogen for the final system.

What we offer?

This PhD position is a unique opportunity of carrying out cutting-edge energy-related research in a fast growing Swiss start-up along with academic supervision from one of the leading engineering institutions in Europe with great visibility worldwide.

We offer a pleasant working environment in a small, dynamic, innovative, and international team. We cultivate an entrepreneurial spirit and are oriented towards the development of our collaborators in order to achieve our ambitious goals. Since the company is in a high-growth phase of its development, many opportunities for professional development alongside academic growth exist.

What are you going to do?

The PhD student will join the thermal engineering group of the company where he/she will work towards the modelling and optimization of the metal hydrides compressor and storage systems. Models of different complexity and dimensionality will be developed in order to gain a deeper understanding into the various phenomena and most influential design parameters. The PhD student will closely collaborate with the material science group to determine the metal hydrides properties, such as particle

size, shape and material, to achieve the technical specifications for the final product. Experiments will be carried out to validate the model predictions and to thermally characterize the developed materials.

What do we require?

The ideal candidate should:

- Have completed (or be about to complete) a Master degree in chemical/mechanical engineering or a relevant field with a strong focus on heat transfer, chemical engineering, thermodynamics, fluid dynamics and simulations
- Be very comfortable with programming in a high level language (Python, Julia) and competent in a low level language (C, C++, Fortran)
- Have gathered first experience with thermal simulations of complex systems; knowledge of a commercial software is an advantage
- Have experience in data analysis; additional experience in experimental setups and data acquisition is a plus
- Be an excellent communicator, flexible, autonomous and open to new challenges
- Excellent analytical thinking and creative development of solutions
- Be fluent in English; knowledge of German and/or French is an advantage
- Ready to successfully complete a PhD thesis and to develop in an academic environment

In case of interest, please send your application documents in electronic form to hr@grz-technologies.com. We are looking forward to hearing from you.