

## Simulation-based development of a metal hydride hydrogen tank

### Description

To facilitate the switch to green renewable hydrogen an efficient storage is of the utmost importance. Metal hydrides represent a promising alternative to the conventional compressed gaseous (350/700 bar) and liquid hydrogen storage by offering higher volumetric capacities and increased safety due to hydrogen being chemically in-bound at lower pressures. One of the main challenges is to improve the thermal management, which is decisive for the speed of hydrogen ab- and desorption. The aim of this master's thesis is to develop a low-cost and resource-conserving metal hydride storage tank concept with improved thermal management using advanced simulation methods (3D CFD, FEM).

### Content

- Literature research and requirement analysis (1 month)
- Development of tank designs (CAD), concepts for improved thermal management and simulation models (2 months)
- 3D CFD (heat transfer) and FEM (thermal stresses, material expansion) simulation of different designs and benchmarking with a commercially available MH tank (2 months)
- Creation of written master thesis in english or german (1 month)

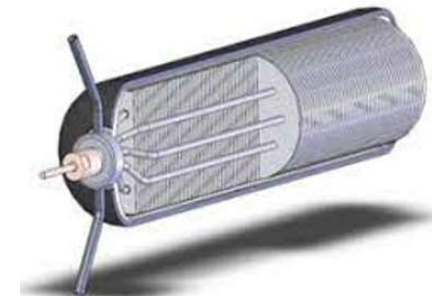
**Start** ca. 06/2022

**Duration** ca. 6 months

**Compensation** € 2.600

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